

ERIA RESEARCH PROJECT REPORT 2009, No. 8

# **INTEGRATING SMALL AND MEDIUM ENTERPRISES (SMES) INTO THE MORE INTEGRATED EAST ASIA**

Edited by

**VO TRI THANH**

**DIONISIUS NARJOKO**

**SOTHEA OUM**

March 2010

## TABLE OF CONTENTS

	Table of Contents	i
	List of Project Members	ii
	Acknowledgements	iv
	Executive Summary	v
CHAPTER 1.	Overview: Integrating Small and Medium Enterprises (SMEs) into the More Integrated East Asia <i>Vo Tri Thanh, Sothea Oum and Dionisius Narjoko</i>	1
CHAPTER 2.	SMEs and Regional Production Networks <i>Charles Harvie</i>	18
CHAPTER 3.	SMEs and Production Network - Framework <i>Charles Harvie</i>	47
CHAPTER 4.	Constraints to Growth and Firm Characteristics Determinants of SME Participation in Production Networks <i>Charles Harvie, Dionisius Narjoko and Sothea Oum</i>	70
CHAPTER 5.	Constraints on SMEs in Cambodia and their Participation in Production Networks <i>Chheang Vannarith, Sothea Oum and Leng Thearith</i>	137
CHAPTER 6.	Integrating Lao SMEs into a More Integrated East Asia Region <i>Phouphet Kyophilavong</i>	168
CHAPTER 7.	Integrating Small and Medium Enterprises into the more Integrated East Asia Region: The Case of Vietnam <i>Tran Tien Cuong, Bui Van Dung, Nguyen Thanh Tam and Trinh Duc Chieu</i>	199
CHAPTER 8.	Integrating SMEs into East Asia Production Networks: Thailand <i>Chaiyuth Punyasavatsut</i>	268
CHAPTER 9.	The Significance of Production Networks in Productivity, Export and Technological Upgrading: Small and Medium Enterprises in Electric-Electronics, Textile-Garments, Automotives and Wood Products in Malaysia <i>Rajah Rasiah, Mohd. Rosli and Puvanesvaran Sanjivee</i>	305
CHAPTER 10.	Small and Medium Enterprises in Regional Production Networks: An Indonesian Case <i>T.M Zakir Machmud and Rizki N. Siregar</i>	340
CHAPTER 11.	Integrating SMEs into the East Asia Region: The Philippines <i>Rafaelita Aldaba, Erlinda Medalla, Fatima Del Prado and Donald Yasay</i>	381
CHAPTER 12.	Integrating China's Small and Medium Enterprises into International Production Networks: Barrier and Policy Responses. <i>Sun Xuegong and Liu Xueyan</i>	437
CHAPTER 13.	Japanese SMEs and International Production/Distribution Networks in East Asia <i>Mitsuyo Ando</i>	469

## LIST OF PROJECT MEMBERS

- PROFESSOR FUKUNARI KIMURA (PROJECT SUPERVISOR):** Chief Economist, Economic Research Institute for ASEAN and East Asia (ERIA), Indonesia. Professor, Faculty of Economics, Keio University, Japan.
- DR. VO TRI THANH (PROJECT LEADER):** Vice President, Central Institute for Economic Management (CIEM), Vietnam.
- DR. CHARLES HARVIE:** Associate Professor, Director of Centre for Small Business and Regional Research, School of Economics, Faculty Commerce, University Wollongong, Australia.
- DR. DIONISIUS NARJOKO (PROJECT COORDINATOR):** Researcher, Economic Research Institute for ASEAN and East Asia (ERIA), Indonesia.
- DR. SOTHEA OUM (PROJECT COORDINATOR):** Associate Researcher, Economic Research Institute for ASEAN and East Asia (ERIA), Indonesia.
- DR. TRAN TIEN CUONG:** Director of Enterprise Reform and Development Department, Central Institute for Economic Management (CIEM), Vietnam.
- DR. CHHEANG VANNARITH:** Executive Director, Cambodia Institute for Cooperation and Peace (CICP), Cambodia.
- MR. LENG THEARITH:** Researcher Fellow, Cambodia Institute for Cooperation and Peace (CICP), Cambodia.
- DR. PHOUPHET KYOPHILAVONG:** Lecturer, Department of Economics, national University of Laos, Lao PDR.
- DR. CHAIYUTH PUNYASAVATSUT:** Associate Professor, Faculty of Economics, Thammasat University, Thailand.
- DR. RAFAELITA ALDABA:** Senior Research Fellow, Philippine Institute for Development Studies (PIDS), Philippines.
- DR. ERLINDA MEDALLA:** Senior Research Fellow, Philippine Institute for Development Studies (PIDS), Philippines.
- Ms. FATIMA DEL PRADO:** Research Specialist, Philippine Institute for Development Studies (PIDS), Philippines.
- MR. DONALD YASAY:** Research Analyst, Philippine Institute for Development Studies (PIDS), Philippines.
- DR. ZAKIR MACHMUD:** Associate Director for Economic and Policy Research, Institute for Economics and Social Research, Faculty of Economics, University of Indonesia.

**MS. RIZKI N. SIREGAR:** Researcher, Institute for Economics and Social Research, Faculty of Economics, University of Indonesia.

**PROFESSOR RAJAH RASIAH:** Professor of Technology and Innovation Policy, Dean, Faculty of Economics and Administration, University of Malaya, Malaysia.

**DR. MOHD ROSLI:** Associate Professor, Faculty of Economics and Administration, University of Malaya, Malaysia.

**MR. PUVANESVARAN SANJIVEE:** University of Malaya, Malaysia.

**DR. MITSUYO ANDO:** Associate Professor, Keio University, Japan.

**DR. SUN XUEGONG:** Senior Fellow, Institute of Economic Research, National Development and Reform Commission (NDRC), China.

**DR. LIU XUEYUAN:** Senior Fellow, Institute of Economic Research, National Development and Reform Commission (NDRC), China.

## **Acknowledgements**

This report consists of the papers from ERIA's SME research working group in Fiscal Year 2009. It aims to improve our understanding on how to effectively increase SMEs participation in the East Asian production networks. All papers presented in this report were presented in two workshops held in Jakarta over the period of August 2009 to February 2010.

We would like to express our appreciation and gratitude, first and foremost, to the members of our working group for their scholarly contribution to the completion of this research.

We are deeply indebted to Professor Fukunari Kimura, Chief Economist of ERIA, for his intellectual guidance, encouragement, and supports for the research project.

ERIA management support is crucial for the completion of this research. We are profoundly grateful for the strong support provided by our Executive Director, Mr. Hidetoshi Nishimura, General Manager, Mr. Daiki Kasugahara, Finance Manager, Mr. Koshi Yamada, and all esteem administrative staffs of ERIA for their excellent logistic supports.

Last, but not least, we would like to thank our colleagues, ERIA researchers, for their enthusiasm and participation in our workshops.

**Vo Tri Thanh**

**Dionisius Narjoko**

**Sothea Oum**

## **EXECUTIVE SUMMARY**

### **1. Background and research objective**

ASEAN adopted the Policy Blueprint in 2004-2014 that outlines the framework for SME development for equitable economic development in the ASEAN region. Among the actions is the promotion of SME networking and their participation in the regional production and distribution networks.

Production networks models postulate that there are at least two-tiers of suppliers that provide a flagship company, or assemblers of final goods, with intermediate inputs. SMEs are usually part of firms in the lower-tiers. The main competitive value of firms in these tiers come from the low cost structure and high degree of flexibility. However, a significant proportion of SMEs are also at risk because of the more liberalized and fiercer competitive environment. Therefore, there is always survival threat because SMEs are located in the weakest link in a production network.

This research project aims at improving our understanding on how to effectively increase SMEs participation in the East Asian production network and what their issues and challenges are. The research does not only contribute to filling the theory-practice gap, but also lay down a good foundation for designing national arrangements as well as a regional institutional framework for supporting SMEs. In the attempt to achieve this objective, the study puts forward two interrelated questions: (1) what are the constraints of SME growth, both in general and according to the status of SME participation in production networks?, and (2) which firm characteristics determine SME participation and performance in production networks? Answering the questions extend the previous studies by an attempt to create an integrated understanding about the situation at regional level.

## **2. Summary of Key Findings**

Empirical analyses conducted by member of this research project produce some interesting and useful findings.

First, on the results that utilize all observations in the sample (or the integrated results/study), investigation based on perception survey indicates differences in the constraints facing SMEs that operate in production networks, compared to those that do not operate in the networks. SMEs in production networks consider distribution-logistics and business environment barriers more importantly than those outside of the networks. Both of the descriptive and econometric results suggest that productivity, foreign ownership, financial characteristics, innovation efforts, and managerial/entrepreneurial attitude are the important firm characteristics that determine SME participation in production networks.

The investigation is extended by analyzing the issue of SMEs and moving up to higher quality tiers in production networks. For those that are in lower quality of production network, internal constraints are critical to them in contrast to external constraints faced by those that are in higher quality of production network. Meanwhile, the econometric analysis reveals similar characteristic determinants as those in SME participation. That is, foreign ownership, productivity, and access to finance, as well as capability of SMEs in servicing their debts determine the chance of SMEs operating in lower tiers to move up to the higher tiers. Meanwhile, the notable difference is that, now size becomes an important determinant while effort to innovate and managerial attitude become less important determinants.

Second, there seems to be a picture that in some countries, SMEs are significantly constrained by their internal resources in performing well and improving the chance to participate in production networks. The results from Cambodian country-paper, for example, indicate that firms outside of production networks suffer substantially from the lack of financial and managerial capability, inability to compete with other firms, and difficulty in having wider information/networks. All these weakness also appear in the results and analysis of the country paper (i.e., the Vietnamese and Laos country paper). In addition, the results coming from these countries' study underline the barriers that

SMEs face to either acquire advanced technology, or even just to improve their technology capability. As noted in the Vietnamese study, all these weaknesses often lead SMEs in these countries for not being able to meet the strict quality-standard of goods demanded by other firms in higher tiers of a production network.

Third, rather in contrast, the results coming from the studies of some other countries, which happens to be the more advanced or older ASEAN countries (i.e. Thailand, Indonesia, and to some extent the Philippine), suggest that SMEs in these countries do not consider the internal resource as their biggest weakness, or posing the greatest barriers, for their performance. Firms in these countries thus have ability to engage in production networks. These studies claim that unfavorable business environment or direct investment climate are the more important barriers. In other words, these SMEs care more about external barriers rather than internal barriers.

Fourth, access to finance poses a binding constraint for most SMEs in the countries covered by the study. This is bearing in mind the two different impressions mentioned in the previous two points. Meanwhile, findings from country studies underline and are consistent with the findings from integrated results in suggesting the importance of having higher productivity and sufficient technology capability for higher probability to participate in production networks.

Fifth, learning from the Japanese SMEs that operate in countries in East Asia, competitive SMEs are likely to expand their operations both domestically and internationally, mainly in East Asia, by effectively being involved in the production/distribution networks in the region. To further develop international production networks and to deeply involve SMEs in the networks, various facilitation measures are important for both hosting and investing countries.

### **3. Summary of Policy Implications**

The following are the summary of policy implication that can be drawn from this study.



First, the study confirms the common understanding of most issues faced by the SMEs in region, such as poor access to finance, unfavorable business and investment environment (in broad view), and low internal capacity.

Second, though the low-quality and better-quality SMEs that participate in production networks share similar most serious constraints for development, there is a room for SMEs to upgrade their position, from lower to higher tiers, in production networks.

Third, an effective engagement of SMEs in production networks is also outcome of the interaction between several domestic and external factors, which can significantly affect SMEs' international linkages and production cost, and their ability to have new business and to expand production. This is particular the case of deeper regional integration and the institutional arrangements at regional level for supporting SMEs can play an important role.

#### ***Developing SMEs and Promoting SMEs to Engage in Production Networks***

Fourth, a multi-pronged approach is needed to tackle the lack of financing issue. Credit reporting agencies should be established either privately or publicly. Various credit guarantee schemes can be developed for helping SMEs to access to finance. It is preferable for private sector and business associations to be important players in these schemes. Direct financing for SMEs through stock market should bring into play. SMEs can also benefit from leasing activities in financing their medium and long term investment such as purchasing machineries and durable assets for their business.

Fifth, capacity building is an essential measure to strengthen SMES' managerial skills and capability. In particular, this helps SMES to meet the standard requirements (e.g. on project proposals, financial statements, accounting reports) for getting access to formal finance. Other important building programs are counseling and advice, business coaching, and short-run on-job training, training on modern management system, and training on (simple) information and communication technology.

### ***Promoting SMEs to Participate more Effectively in Production Networks***

Sixth, foreign ownership can play an important role in promoting SMEs to have higher-quality participation in production networks. Not only large foreign-invested enterprises as flagship firms, but foreign SMEs (especially those from advanced economies) can also have significant contribution for widening the value of regional production networks. Attracting foreign direct investment, therefore, should emphasize equivalently on both large and small and medium firms.

Seventh, firm technological and innovation capability is another determinant of the quality upgrading of SMEs in production networks. This requires a good infrastructure for technological transfer, namely modern telecommunication network, widely covered internet, highly qualified educational institutions, and IPRs protection.

### ***Strengthening the Regional Institutional Arrangements for Supporting SMEs***

All types of regional cooperation should have components for capacity building and for SMEs' development. The case of IAI is exclusion. Though SMEs share several similarities in terms of challenges/issues facing them, they are heterogeneous. At regional level, it is reasonable for having both general as well as selective and more focus programs to support SMEs. Once again, the exchange of professional, scholars, and entrepreneurs across the regions should be encouraged. This not only promotes information flow, but more importantly also enhances the knowledge stock of all countries, including those relevant for SMEs.

Third, as product standards may act as NTBs, the regional MRAs could facilitate SMEs access to market and lower transaction costs by eliminating duplicative testing. Thus, the MRAs could also deepen SMEs participation regional production networks. There has been progress in reaching some MRAs among ASEAN countries. But the way to go is still far from the destination. MRAs are needed for various goods produced in East Asia and they must be carefully devised to ensure that the lowest quality does not become the standard.

## **CHAPTER 1**

### **Overview:**

# **Integrating Small and Medium Enterprises (SMEs) into the More Integrated East Asia**

**VO TRI THANH**

Central Institute for Economic Management (CIEM),  
Hanoi, Vietnam

**SOTHEA OUM**

Economic Research Institute for ASEAN and East Asia (ERIA)  
Jakarta, Indonesia

**DIONISIUS NARJOKO**

Economic Research Institute for ASEAN and East Asia (ERIA)  
Jakarta, Indonesia

## 1. Background and Research Objective

At the Summit in December 1997, the ASEAN Leaders decided to adopt the ASEAN 2020 Vision, aiming at transforming ASEAN into a stable, prosperous, and highly competitive region with equitable economic development, and reduced poverty and socio-economic disparities. The Vision was re-affirmed at the ASEAN Summits in 2007. The ASEAN Leaders expressed their commitment to accelerate the establishment of an ASEAN Economic Community (AEC) by 2015 as a single market and production base. In line with this, the ASEAN Economic Ministers Meeting (AEM) in August 2006 agreed to develop “*a single and coherent blueprint for advancing the AEC by identifying the characteristics and elements of the AEC...*” .

In this framework, ASEAN adopted the Policy Blueprint in 2004-2014 that outlines the framework for SME development as a key measure for equitable economic development in ASEAN region. Specifically, its objectives are to: (i) accelerate the pace of SME development, optimizing on the diversities of ASEAN Member countries; (ii) enhance the competitiveness and dynamism of ASEAN SMEs by facilitating their access to information, market, human resource development and skills, finance as well as technology; (iii) strengthen the resilience of ASEAN SMEs to better withstand adverse macroeconomic and financial difficulties, as well as the challenges of a more liberalized trading environment; *and* (iv) increase the contribution of SMEs to the overall economic growth and development of ASEAN as a region.

Among the actions is the promotion of SME networking and their participation in the regional production and distribution networks. From theoretical points of view, the role of SMEs in a cross-country production network is related to the idea of a “flagship”. A flagship provides strategic and organizational leadership beyond resources that lie directly under management’s control (Rugman 1997), and therefore a strategy of a flagship company governs the position and role of participating firms in the network. These include SMEs, for the reason that a flagship company retains in-house much of its activities in that the company has some comparative advantage on and it outsources the rest.

Production networks models postulate that there are at least two-tiers of suppliers that provide a flagship company, or assemblers of final goods with intermediate inputs. SMEs are usually part of firms in the lower-tiers. The main competitive value of firms in these tiers come from the low cost structure and high degree of flexibility. However, a significant proportion of SMEs are also at risk because of the more liberalized and fiercer competitive environment – as a general consensus, growth of production networks, particular those in East Asia, was significantly contributed by trade and investment liberalization during the 1980s and 1990s. There is a survival threat because SMEs are located in the weakest link in a production network; they are typically used as price breakers and capacity buffers, and therefore, can be dropped from the network at short notice (Ernst 2004). This threat needs to be addressed, via improvements in specialization, productivity and linkages, all of which need skilled human resources and a strong base for knowledge dissemination, as well as strong international linkages for facilitating all of these (Ernst 2004).

In East Asia, international production networks in manufacturing, particularly machinery industries, have developed over the last two decades with drastic increase in intra-industry trade and vertical back-and-forth transactions of parts and components. In the production networks the role of SMEs can not be neglected.

The ERIA has completed a research project examining SMEs policies within the framework of globalization and production networks with particular emphases on 4 areas: innovativeness, market expansion, competitiveness, and networking for ten countries in the region. This is consistent with the objectives of ERIA, two of which are to facilitate AEC buildings and to support ASEAN's role as the driver of wider economic integration. The findings from the research reveal that the challenges faced by SMEs to embrace these four areas are heterogeneous depending on stages of industrialization and business environment of each participating countries. The findings seem to conclude that internal barriers such as poor access to finance, lack of human resources, inadequate infrastructure, lack of legal and regulation framework, and poor investment and business climate appear to be dominant in most developing Asian countries (Lim 2009). General policy recommendations have been laid out to address these challenges.

The ERIA SMEs research in Fiscal Year 2009 aims at improving our understanding on how to effectively increase SMEs participation in the East Asian production networks and what their issues and challenges are. The research does not only contribute to filling the theory-practice gap, but also lay down a good foundation for designing national arrangements as well as a regional institutional framework for supporting SMEs.

In the attempt to achieve the objective, the study put forward two interrelated and general questions: (1) what are the constraints of SME growth, both in general and according to the status of SME participation in production networks?, and (2) which firm characteristics determine SME participation and performance in production networks? Answering these questions extend the previous research by an attempt to create an integrated understanding about the situation at regional level.

## **2. Methodology**

This study adopts a uniform questionnaire survey to accommodate the integrative nature of the study. The advantage of using this method is the ability to produce comparative statistics and analysis across the countries participated in the research. The questionnaire has two parts. The first part asks SMEs about their perception on the importance of some barriers of SME growth identified by earlier studies, while the second part collects information about the characteristics of the SMEs. Given the topic of this study, the questionnaire obviously asks several questions that try to identify the position of the respondents in the network of production.

The survey was conducted over the two or three last months of 2009 and adopts a one-to-one approach to minimize reporting errors (i.e., the researchers pay one or two visits to the respondents in order to complete the information needed by the questionnaire). As a result, the study managed to gather slightly more than 900

respondents covering eight ASEAN member countries (i.e., Cambodia, Lao PDR, Vietnam, Thailand, Malaysia, Indonesia, and the Philippine) only in a limited time.<sup>1</sup>

### **3. Structure of the Report and Key Findings**

Chapter 2 provides a context for the analysis and discussion in the subsequent chapters, contributed by Charles Harvie. In particular, it reviews the role and significance of the SME sector in the economic development of East Asia, discusses the potential opportunities and challenges facing SMEs from participation in production networks, and highlights key areas for capacity building if SMEs are to achieve their full potential from this participation.

In Chapter 3, Charles Harvie develops and presents a framework for analysis of the characteristics required to enhance the capability of SMEs participating in regional production networks. The framework provides the basis for the empirical analysis, hypotheses testing and profiling developed in subsequent chapters, aimed at highlighting the key characteristics of SMEs that participate in production networks and, in particular, the characteristics of those SMEs that participate in high quality parts of a production network. The discussion in the framework emphasizes the importance of resource factors, psychological factors and external environment factors in impacting upon the barriers and capability of an SME, and that this determines the business strategy adopted by the SME. One of these involves the decision to participate in a production network.

The authors of the previous chapter continue their work by empirically investigate SME participation and performance in production networks. This is done in Chapter 4. The investigation gauges the constraints of SME growth and firm characteristics determinants, building on the framework developed earlier and based on the *ERIA Survey on SME Participation in Production Networks*.

---

<sup>1</sup> The study for Japan in this Working Group does not have the survey component, owing to limited resources. The Japanese country study utilizes the data of Japanese firms who have small and medium affiliates in other countries in the Asian region.

The results of perception survey indicate differences in the constraints facing SMEs that operate in production networks, compared to those that do not operate in the networks. SMEs in production networks consider distribution-logistics and business environment barriers more importantly than those out of the networks. The descriptive and econometric results suggest that productivity, foreign ownership, financial characteristics, innovation efforts, and managerial/entrepreneurial attitude are the important firm characteristics that determine SME participation in production networks.

This chapter extends the analyses by considering the issue of SMEs and moving up to higher-quality tiers in production networks. For those operating in lower-quality tiers of production network, internal constraints are critical, and this is in contrast to external constraints faced by those in higher-quality tiers of the network. Meanwhile, the econometric analysis reveals similar characteristic determinants as those for the SME participation in production network. The difference is that, now size becomes an important determinant while effort to innovate and managerial attitude become less important determinants.

In Chapter 5, Chheang Vannarith, Oum Sothea, and Leng Thearith emphasize a significant role of SMEs in Cambodian economic development, especially in the context of the global economic crisis. Regional integration in Southeast and East Asia has created both opportunities and challenges for Cambodia's SMEs. Their limited capacity for business expansion and integration in production networks restrain Cambodia SMEs from making use of regional integration. There are certain different characteristics for those SMEs that participate in production networks from those which do not, such as their higher productivity, business capability and innovation. Most surveyed SMEs are operating under severe internal constraints. For those that are not in the production networks, the majority of the constraints are in their Functional Barriers (management, finance capability) and ability to compete (Product and Price barriers), and "Information" appear to be their main hindrances. For SMEs that are in production networks, both the detailed and main category ranking of constraints is consistently high on "Functional Barriers" and "Product and Price Barriers". Though SMEs receive some assistance, they still need support in the fields of "Business linkages and networking" and "Financing". Since access to financing is consistently viewed as one of the biggest constraints faced by SMEs, specialized SME banks, which are very common in the



region, should be established, or a loan or mortgage guarantee from the government as practiced in Indonesia should be considered. An SME Development Fund and SME Business Development Services (BDS) could be another option to iron out these constraints.

Phouphet Kyophilavong, for his Chapter 6 on Laos, examines the barriers confronting Lao SMEs and to identify factors enabling successful participation in production networks. The results show that recently Lao SMEs have performed quite well, but they are still facing various issues; financial constraints are the biggest challenge for Lao SMEs. In terms of internal barriers, a shortage of working capital is top ranked, followed by the difficulty of matching competitors' prices. In terms of external barriers, lack of government assistance/incentives and poor economic conditions in home market are top ranked. Production and price barriers are ranked as the most important barriers. The characteristics of SMEs in production networks are strong business capacities, a high share of foreign investors, and the ability to access financial sources. Therefore, the government has given high priority to solve these issues and to promoting membership by Lao SMEs of business networks in ASEAN. In order to promote production networks, it is especially important to address is the shortage of working capital, as well as to improve SMEs to meet international standards.

Tran Tien Cuong, Bui Van Dung, Nguyen Thanh Tam, Trinh Duc Chieu, takes up in Chapter 7, the case of Vietnam. The Chapter indicates that during the process of entering production networks, Vietnamese SMEs are confronted with many obstacles. These obstacles are the result of businesses internal factors, such as limitations in capital, technology, and human resource, as well as a lack of market information about. External difficulties and challenges arise from the pressure of meeting the requirements of foreign manufacturers or importers in the production networks, and limitations of macro-economic policies such as tariffs, technical barriers and the general business environment. As for the solutions, the authors argues that the Government should diversify sources of information, such as enhancing the function and effectiveness of Vietnamese trade missions abroad, establishing an integrated information system, improving in the government's trade promotion programs, technology transfer, raise the quality of human resource by improving professional training systems, solving the

problem of shortages of working capital to finance new business plans by promoting a national credit guarantee program for SMEs, and improving establishing and maintaining a transparent and favorable business environment. For SMEs part, the authors suggest that SMEs should, first, offer competitive prices to customers by cutting unnecessary costs, and improving the quality of products and by-products. SMEs must also take the initiative in accessing sources of information and invest more in these long-term activities such as research and development (R&D). Better treatment and working environments to attract and retain excellent and skilled workforce.

In Chapter 8, Chaiyuth Punyasavatsut examines barriers facing Thai SMEs, and identifies success factors for better participation in production networks. Overall, SMEs in Thailand perceived external barriers - business environment and tax, tariff and nontariff- as the most significant barriers. Key barriers for SMEs in the networks are difficulties in meeting product quality and standards, and in matching competitors' prices, and lack of personnel for market expansion. Salient characteristics among SMEs participating actively in networks are their strong technological capabilities and proximity to ports or location within industrial estates. As for policy recommendation, the author proposed that, first of all, Thailand urgently needs to improve its investment climate. At the moment, a stable and secure investment in Thailand requires political stability and clarification of regulations and enforcement. Second, Thailand needs to strengthen the absorptive capacities of SMEs with special attention given to technological capability development, and dissemination to SMEs. Third, Thailand will also need to keep raising the size and quality of its science and technology workforce. Fourth, Thailand needs proactive support for networking between large enterprises and SMEs. Previous supporting activities were mainly limited to awareness-building and matching SMEs with MNEs. Future policies for strengthening business linkages and the absorptive capacities of domestic SMEs will need to be exercised in a better-coordinated manner.

In Chapter 9, Rajah Rasiah, Mohd Rosli, and Puvanesvaran Sanjivee assess the impact of production networks on productivity, exports and technological upgrading of SMEs in the Malaysian electric-electronics, textiles-garments, automotive, and wood industries. They find that whereas more integrated firms were showing higher production linkages domestically, less integrated firms showed higher export intensities.

Among the technological variables that were significant, less integrated firms showed higher intensities than more integrated firms. More integrated firms reported higher incidence of barriers and potential solutions than less integrated firms among the statistically significant differences in the means. Although more integrated SMEs appear to face more serious financial problems than less integrated firms, it is largely because of the latter being smaller than the former. The policy solution for Malaysian SMEs here then should be targeted at examining, in greater detail, the sources of finance accessed by the smaller SMEs. Given the positive results of domestic production networks, the Malaysian government should include the ex-ante vetting, monitoring and ex-post appraisal of SME conduct and performance using domestic production network framework to better support them. In doing so it is also important to give greater weight to the specificity of each of the industries as the nature of influence exerted by production networks tends to be different in each of them. It will also help governments in Southeast Asia to carefully examine the nexus between suppliers, buyers, and economic performance so as to stimulate inter-firm production synergies to capture greater performance by the firms. Connecting in value chains is the starting point. Efforts must then be taken to stimulate their movement atop the value chain.

In Chapter 10, T.M Zakir Machmud and Rizki N Siregar identify and examine key characteristics and constraints faced by Indonesian SMEs, in general and according to their status in production networks, as well as to draw some policy implications. The survey reveals that there are significant differences between the characteristics and perceptions of the production network group and those of the out-of-production network group. These variations in perceptions result from differences in group characteristics and the circumstances these two groups face. Therefore, different policy approaches are recommended. The study utilizes a survey of selected manufacturing industries that was recently conducted in three provinces in Java. The key characteristics findings are as follows: overall, the majority of SMEs surveyed are domestically owned, traditionally organized and still domestic-oriented. On average, they have been established for more than 15 years, employ up to 50 workers, of whom a large proportion are males with high school-level education or less, they still rely on their own money to finance their business, and they sell their product primarily to local final assemblers and wholesalers/retailers. The SMEs surveyed also mainly acquire raw

materials from local suppliers. While the characteristics of out-of-production network SMEs have a lot in common with the overall sample, the characteristics of production network SMEs vary greatly. Although only a small number were included in the survey, production network SMEs are on average bigger in size, conduct their businesses using modern methods, and are more open internationally. The significant variation in characteristics between the two groups is also reflected in the groups' perceived barriers to SME growth and development, as well as in the effectiveness of assistance received. While out-of-production network SMEs are more concerned about internal barriers, those working within production networks focus more on external barriers. Taking into account these differences in characteristics and perceptions, separate policy measures should be addressed for each group.

Rafaelita Aldaba, Erlinda Medalla, Fatima del Prado and Donald Yasay, for Chapter 11 on the Philippines, examine the characteristics and factors that constrain the growth of SMEs operating both within and outside production networks. Based on a survey of 101 firms, the analysis shows that SMEs are not homogeneous. While they share certain characteristics such as age, Filipino ownership, and foreign equity share; they differ in terms of performance, export intensity, interest rates on borrowings, major sources of finance, and other economic indicators. The results also show that participation in international production networks (IPNs) benefits SMEs, particularly parts and components makers in the electronics and auto industries. In terms of performance, IPN firms have higher mean growth rates and mean labor productivity than non-IPN firms. In terms of barriers to growth, IPN firms are primarily concerned with product and price barriers and difficulties in establishing and maintaining trust with business partners while non-IPN firms' major concerns are tax, tariff and non-tariff barriers and the country's deteriorating business environment. Two themes dominate SMEs' concerns about the type of assistance needed. For IPN firms, financing assistance is crucial while for non-IPN firms, technology development is the most important.

Sun Xuegong, Liu Xueyan, in Chapter 12, in their study on SMEs in China concludes that small and medium enterprises (SMEs) play an important role in China's economy, contributing a significant share of GDP, employment and tax. They argue that as China has been increasingly integrating with the world and regional economy,

SMEs have been presented with opportunities to be part of international production networks. However, their lack of access to external financing, weak business capabilities, less competitive prices and quality of products, and a deficiency of market information have proved to be major barriers for their integration into networks, as suggested by this survey conducted in Tianjin city, China. The survey also shows that other significant factors inhibiting integration include the location of an SME, measured both by distance to a major sea or air port, and by whether or not it is situated in a development zone, the education attainment of its employees, the size of the SME and the industry in which it operates. As for policy recommendation, China needs to address both the barriers to integration and the most needed assistance, as perceived by the SME. Based on the survey, China should improve the access of SMEs to financing by adjusting the financial structure and market, strengthen the business capability of SMEs by better public service, modernize the information service to SMEs, and improve the use of development zones so as to boost integration.

In Chapter 13, Mitsuyo Ando investigates the mechanisms and features of the development of international production/distribution networks in East Asia, focusing on the Japanese SMEs, from the viewpoint of one of the major players in the regional production networks. The analysis demonstrates that active FDI in vertical supply chains by SMEs, particularly in recent years, contributes to the formation of agglomeration and industrial clusters and further development of the networks in East Asia. Our analysis also demonstrates that competitive SMEs are likely to expand their operations both domestically and internationally, mainly in East Asia, by effectively being involved in the production/distribution networks in the region. To further develop international production networks and to deeply involve SMEs in the networks, various facilitation measures are important for both hosting and investing countries. On the host country side, besides reduction of tariffs on parts and final products, factors such as strengthening protection of IPRs, ensuring security and safety, and speedy procedures for trade and investment seem to be effective measures to help promote foreign market expansion and FDI for SMEs. Moreover, regardless of whether large firms or SMEs, the development of human capital and physical infrastructure, transparency in legal systems and their implementation, particularly of tax-related regulations, and improvement of labor-related issues are keys for hosting FDI. On the investing side,

providing various financing arrangements would help SMEs seeking investment to obtain financial resources. Furthermore, an assistance of investing firms, particularly investing SMEs, in gathering necessary local information is crucial to facilitate investment. All of these efforts from various different angles for both hosting and investing countries should encourage SMEs to be an essential part of East Asia's international production/distribution networks, and thereby assist in strengthening their competitiveness by effectively being involved in these networks.

#### **4. Policy Implications**

The findings from analysis of the constraints of SMEs development, especially from regional perspective create several important policy implications. *First*, they reconfirm the common understanding of most issues faced by the SMEs in region, such as poor access to finance, unfavorable business and investment environment (in broad view), and low internal capacity. Meanwhile, those superior characteristics of SMEs in production network over those not engaged in indicate that participation in production network strongly benefits SMEs and that the more developed the higher probability an SME participating in a production network. Therefore, a growth-oriented policy should focus on promoting SMEs to participate in production networks and in turn, it requires also the overall measures to develop SMEs.

*Second*, though the low-quality and better-quality SMEs that participate in production network share similar most serious constraints for development, there is a room for SMEs to upgrade their position, from lower to higher tiers, in production network. This is supported by the findings in chapter 4. Specifically, SMEs are suggested to have higher chance to upgrade to the higher-quality tiers of production networks if they are able to, among other, improve their productivity, have more of foreign ownership share, and have better access to financial support.

*Third*, an effective engagement of SMEs in production network is also outcome of the interaction between several domestic and external factors, which can significantly affect SMEs' international linkages and production cost, and their ability to have new

business and to expand production. This is particular the case of deeper regional integration and the institutional arrangements at regional level for supporting SMEs can play an important role.

#### *Developing SMEs and promoting SMEs to engage in PN*

The most serious barrier that impedes SMEs from developing and exploring their business opportunities is capital shortage. There are several factors conditioning SMEs to *access to formal finance*. First, SMEs often do not have assets that can be given to creditors as collateral. Second, a plenty of SMEs basically cannot meet the commercial bank standards though willing to take loans. Third, the survey also finds that retained earning and personal saving are the two main financial sources for SMEs in general and SMEs that do not participate. This implies that several SMEs may not be well exposed to various financial sources. In addition, they tend to be risk-averse in making decision to expand business using third parties' funds.

To address the above problems, a multi-pronged approach is needed. In order to help credit institutions to mitigate the risk associated with SME loans, credit reporting agencies should be established either privately or publicly. Various credit guarantee schemes can be developed for helping SMEs to access to finance. To minimize the moral hazard problem, it is preferable for private sector and business associations to be important players in these schemes. Direct financing for SMEs through stock market should also be realized. SMEs can also benefit from leasing activities in financing their medium and long term investment such as purchasing machineries and durable assets for their business. It is important to develop and strengthen various microfinance institutions that provide loans to SMEs.

As “the poor and deteriorating economic conditions” named the most impediment barrier for SMEs in the region to develop, there is a plenty of rooms for the governments to improve *business and investment environment* to help SMEs. This is particularly strongly recommended for the transition countries CLV. This includes simplifying administrative procedures, harmonizing legal frameworks for doing business, increasing policy transparency and accountability, improving infrastructure such as transportation network and logistic system, and expanding the capacity of providing public utilities. All these requirements are widely understood by all regional

countries. The only thing worth noting is that the improvement of overall business and investment environment is much more effective for supporting longer term development of SMES rather than financial and fiscal incentives, which could create distortions in resources allocation.

Insufficient quantity of and/or untrained personnel is one of the big constraint for SMEs in ASEAN countries, especially in CLV countries to compete effectively. *Capacity building* is an essential measure to strengthen SMES' managerial skills and capability. In particular, this helps SMES to meet the standard requirements (e.g. on project proposals, financial statements, accounting reports) for getting access to formal finance. Together with the improvement/reform of professional education and training system (in the long-run), several types of capacity building programs such as counseling and advice, business coaching, and short-run on-job training, could be run for SMEs. Training on modern management system or training on (simple) information and communication technology will help SMEs benefit much in terms of accessing to wider and more thorough market information.

Last but not least, sharing lessons learnt by SMEs, especially by those participating in production network, would raise SMEs' awareness of balance between costs and benefits of being engaged in production network and hence, encourage their willingness to be a link of value chain in the production network.

#### *Promoting SMEs to participate more effectively in production network*

The participation in production network means that SMEs, especially those being in the lower-tier of production network, can have more chances to be upgraded by making improvements in specialization, productivity, and linkages (Hirschman 1958). The appropriate policies can play a role of catalyst for this process.

Both theory and our findings suggest that the connection of flagship firms with SMEs can be more effective as their activities concentrate in clusters. *Successful development of clusters* is complex issue, but at least requiring three interrelated conditions, namely, the presence of flagship firms, attractive infrastructure and low service-link cost, and reasonable cooperation between local authorities, firms, and training and R&D centers.



*The foreign ownership* can play an important role in promoting SMEs to have higher-quality participation in PN. Not only large foreign-invested enterprises as flagship firms, but foreign SMEs (especially those from advanced economies) can also have significant contribution for widening the value of regional PN. Attracting foreign direct investment, therefore, should emphasize equivalently on both large and small and medium firms. To do that, according to the study written by Mitsuyo Ando in this report, the host country side, while reducing tariffs on parts and final products, should strengthen protection of IPRs, ensure security and safety, and speed up procedures for trade and investment. Moreover, the development of human capital and physical infrastructure, transparency in legal systems and their implementation, particularly of tax-related regulations, and improvement of labor-related issues are the key for hosting FDI.

*Firm technological an innovation capability* is another determinant of the quality upgrading of SMEs in PN. This requires a good infrastructure for technological transfer, namely modern telecommunication network, widely covered internet, highly qualified educational institutions, and IPRs protection. These infrastructures provide a platform to help SMEs to upgrade their technology and products to meet international standards and at the end, to sharpen their competitiveness in the market.

#### *Strengthening the regional institutional arrangements for supporting SMEs*

Various *FTAs in East Asia*, being effective or in negotiations have been supporting the region to move from market-driven to a more institutionalized economic integration. They can have significant impacts on the involvement of SMEs in the regional PN. The FTAs' impacts could be very positive, but, depending on several factors, as shown by a number of studies. First, the FTAs should deepen the multilateral trade arrangements of East Asian economies and be harmonized in setting ROO, which usually make distortions in and higher costs for trade flows, especially those having SMEs' involvement. As establishment of the AEC is to have a single market and production base, harmonization of ROO within the AFTA framework with other FTAs of ASEAN+ is very demanding.

Second, the regional economic arrangements should go beyond the traditional FTAS. In that sense, the ASEAN is in right direction of having *comprehensive*

*economic partnerships* (ECPs) with the key partners, in and outside East Asia. The ECPs include also trade and investment facilitation as well as *various forms of cooperation*. This is very much related to development of “hard” and “soft” regional infrastructure and capacity building programs. The successful establishment of ASEAN “Single Window” can be a good example of how the customs procedures could be harmonized and simplified. Huge capital is required for infrastructure (such as regional high way) development. Funds set up or supported by more advanced countries in East Asia (China, Japan, Korea) and international financial institutions, together with appropriate PPP schemes for project implementation and master planning of development of industrial zones/towns along the economic corridor, can be a solution for efficient infrastructure development.

Moreover, all types of regional cooperation should have components for *capacity building and for SMEs’ development*. The case of IAI is exclusion. Though SMEs share several similarities in terms of challenges/issues facing them, they are heterogeneous. At regional level, it is reasonable for having both general as well as selective and more focus programs to support SMEs. Once again, the exchange of professional, scholars, and entrepreneurs across the regions should be encouraged. This not only promotes information flow, but more importantly also enhances the knowledge stock of all countries, including those relevant for SMEs.

Third, as product standards may act as NTBs, the *regional MRAs* could facilitate SMEs access to market and lower transaction costs by eliminating duplicative testing. Thus, the MRAs could also deepen SMEs participation regional production network. There has been progress in reaching some MRAs among ASEAN countries. But the way to go is still far from the destination. MRAs are needed for various goods produced in East Asia and as noted in Narjoko *et al.*, (2010), the MRAs must be carefully devised to ensure that the lowest quality does not become the standard.

## References

- Ernst, Dieter (2004) "Global Production Networks in East Asia's Electronics Industry and Upgrading Prospects in Malaysia." in S. Yusuf, M.A. Altaf, and K. Nabeshima (eds.), *Global Production Networking and Technological Change in East Asia*. Washington DC: The World Bank, pp.89-157.
- Hirschman, A.O. (1958) *Strategy of Economic Development*. New Haven, Connecticut: Yale University Press.
- Lim, H. (ed.) (2009), *Asian SMEs and Globalization*. Jakarta: Economic Research Institute for ASEAN and East Asia (ERIA).
- Narjoko, D., P. Kartika, and T. Wicaksono (2010) "Narrowing the Development Gap in ASEAN." in M.G. Plummer and C. Siow Yue (eds.), *Realizing the ASEAN Economic Community: A Comprehensive Assessment*. Singapore: Institute of Southeast Asian Studies, pp.116-41.
- Rugman, A.M. (1997) "Canada." In John H. Dunning (ed.), *Governments, Globalization, and International Business*, London: Oxford University Press.

## CHAPTER II

### **SMEs and Regional Production Networks**

**CHARLES HARVIE**

Centre for Small Business and Regional Research,  
School of Economics, Faculty of Commerce  
University of Wollongong, Australia

*The onset of globalization and increased regional economic integration has presented new challenges as well as opportunities for SMEs in East Asia. Despite the many barriers and capacity constraints they face arising from their relatively small size, they remain a vibrant and essential ingredient for the economic growth and employment generation of the regional economy. To survive in an increasingly competitive environment requires a new growth paradigm and business strategy for SMEs that focuses upon knowledge and skill acquisition, technology upgrading, innovation and wealth creation. These are likely to be necessary attributes for SME participation in regional and global production networks, and in particular for the high value adding parts of such networks. The former have become very important in explaining the rapid growth of trade and investment flows in East Asia, where intra regional and intra industry trade now predominate.*

*In this context the chapter: conducts an overview of the role and significance of the SME sector in the economic development of East Asia; provides context for this and subsequent chapters relating to the development of production/distribution networks in East Asia; briefly discusses the potential opportunities and challenges facing SMEs from participation in production networks; and highlights key areas for capacity building if SMEs are to achieve their full potential from this participation.*

## 1. Introduction – Background and Context

Small-medium sized Enterprises (SMEs) play a pivotal role in both developed and developing economies in terms of employment generation, output growth, export growth, poverty alleviation, economic empowerment and the wider distribution of wealth<sup>1</sup> (Harvie, 2002, 2008; Harvie and Lee, 2002, 2005; and Asasen et al., 2003). However, for many SMEs their full potential is often not realized due to a number of factors relating to the scale of their businesses: **lack of resources** (finance, technology, skilled labour, market access, and market information); **lack of economies of scale and scope**; **higher transaction costs** relative to large enterprises; **lack of networks** that can contribute to a lack of information, knowledge and experience of domestic and international markets; **increased market concentration** with globalization; an inability to compete against larger firms in terms of **R&D expenditure and innovation** (product, process and organization); they are subject to considerable **‘churning’ and instability**; and they lack entrepreneurial zeal and know-how. In addition, many small businesses find that their geographical isolation puts them at a competitive advantage. Despite these substantial obstacles the East Asian region remains heavily dependent upon SMEs, particularly for employment generation.

The onset of globalization and expanded regional economic integration in the context of East Asia has further intensified the competitive pressures on SMEs in both domestic and international markets. Despite their perceived weaknesses the region retains a dynamic, entrepreneurial and increasingly internationalized SME sector. SMEs have not been swept away with the process of globalization and regional integration, but, rather, their role and contribution has evolved enabling many to retain a competitive position in the global marketplace. The process of globalization has presented new challenges but it has also presented new opportunities for those enterprises most able to respond flexibly and adaptively to rapidly changing regional and global markets. A critical issue is how best to ensure that they fully participate in the business opportunities that will present themselves including that in the form of participating in global and regional value chains or production networks..

---

<sup>1</sup> See Davis, Haltiwanger and Schuh (1993) and Hallberg (2000) for a useful critique on the contribution of SMEs in these areas.

Globalization and regional economic integration have also exerted positive aspects on SME development. Factors encouraging the growth of SMEs include: the rise of **niche markets** and the importance of **customization**; technological advances that have resulted in **discontinuities in production** and product fragmentation; reduced **product life cycles** that have made production flexibility more important than the volume of production; **subcontracting** opportunities arising from the growth of the **global production system** (or production networks that are particularly strong in the context of East Asia); opportunities arising from **global retail sourcing** (the so-called ‘putting out’ system); the increased importance of the **services sector** (dominated by SMEs) due to rising affluence in developing and post industrial societies, as well as in low income developing economies; the importance of **knowledge, skills and innovation** as core sources of competitiveness and value adding in the **new economy** and not just volume of production; their **reduced bureaucracy** and greater **flexibility** and ability to respond to rapidly changing customer demands; their greater **innovation** capacity and ability to **commercialize innovation**, particularly in knowledge and skill intensive sectors where **entry costs are lower**; advances in **information and communications technology** and their ability to utilize **e-commerce** to expand market reach and gain access to information; participation in **clustering** (horizontal and vertical) and **networking**<sup>2</sup> that can facilitate access to spillovers in the form of knowledge and skilled labour, as well as achieve economies of scale and scope which would be impossible in isolation; **flexibility** in technology development, adaptation and application; and finally, recognition by **policy makers** of the important role that they play in economic development, particularly employment generation, by policy makers both at the national level and international regional levels (APEC, ASEAN, ADB etc.)

The focus of this study is upon regional production/distribution networks and the ability of SMEs to penetrate these. The remainder of this chapter proceeds as follows. Section 2 conducts an overview of the role and significance of the SME sector in the economic development of East Asia. Section 3 provides context for the development of

---

<sup>2</sup> A network, as defined here, is a group of firms that cooperate on joint project development complementing each other and specializing in order to overcome common problems, achieve collective efficiency and penetrate markets beyond their individual reach. Whether horizontal or vertical, networks can be developed within, or independently of, clusters.

production/distribution networks in East Asia. Section 4 briefly discusses the opportunities and challenges facing SMEs from production networks. Finally, section 5 provides a summary of the major conclusions from this chapter.

## **2. The Role and Significance of the SME Sector in East Asian Economic Development<sup>3</sup> - An Overview**

SMEs have been recognized as a priority area for the East Asian economies, and more generally within the context of the Asia Pacific Economic Cooperation Forum (APEC), since the 1993 APEC Leaders' meeting in Seattle. Despite being seen as a priority, and the centre of considerable discussion, a clearly enunciated APEC agenda and program of action for SMEs in the region, before the onset of the financial and economic crisis of 1997-98, remained elusive. However, the crisis resulted in many of the countries of East Asia: re-evaluating their industrial policies; placing greater emphasis on improving corporate governance; improving the efficiency and competitiveness of their enterprises; and developing business sectors more able to overcome the vicissitudes of domestic, but more importantly global, market developments (Hall, 1999; Harvie, 2002). The latter is of particular importance in the context of increased economic interdependence and open regionalism. The need to develop more adaptable and flexible economies, and business sectors, has resulted in increased emphasis on the development of the SME sector.

Although SMEs are important across the region there are considerable differences in their role in the various economies<sup>4</sup>. For example, SMEs play a larger structural role in Taiwan, China, Japan, Thailand and Vietnam where they contribute over 70 percent of employment, than they do in Indonesia or Malaysia where they contribute only around 40 percent. In addition, the contribution of the SME sector to exports, and hence the extent of their global integration, also varies widely. They are relatively more export oriented in China, Korea and Taiwan than they are in Japan, Indonesia, Thailand,

---

<sup>3</sup> This section draws extensively upon Hall (1995) and Harvie and Lee (2002).

<sup>4</sup> It is important to emphasise that SMEs are highly heterogeneous and, therefore, it should not be surprising that this role and contribution can vary from one economy to another.

Malaysia and Singapore. Similarly, the dynamic role that SMEs play varies widely. For example, in Singapore, even though SMEs are not as significant in terms of numbers and employment, they are important in providing a flexible skilled production base that attracts larger multi-national corporations (MNCs). The dynamic role that SMEs have played has varied between the various countries. More recently in the case of China, and somewhat reluctantly in the case of Vietnam, entrepreneurial private SMEs and rural enterprises<sup>5</sup>, during the early part of the reform process, have been pivotal in the transition process from a planned to market oriented economy. They have facilitated more efficient resource allocation and marketization of these economies and are increasingly important in creating new jobs and in expanding exports. In the case of Taiwan, SMEs have played a pivotal role in the country's economic development from the beginning. More recently, however, they have been facing increased competition from SMEs in China and Vietnam, because their traditional low cost base is rapidly being eroded. As a consequence they have had to move up the high technology ladder in order to remain globally competitive. Recognizing this requirement the Taiwanese government has been actively assisting in this process. In addition, labour intensive SMEs have also moved offshore to lower labour cost economies in order to retain their competitiveness and market share.

### ***Numbers and contribution to employment***

Table 1 indicates the contribution of SMEs to total enterprises in a number of countries across the region as well as the distribution of enterprise numbers by firm size across a number of APEC regional economies, indicating that most SMEs are micro enterprises<sup>6</sup> and that overall firms are predominantly SMEs (99% plus). Consequently, on sheer numbers alone, they are important. Table 1 also indicates that many developing economies in the region have a large number of micro<sup>7</sup> and small SMEs, many of which are in the informal sector, as well as a dominant (although small in number) large enterprise sector, but they do not have many medium sized enterprises. Hence there is a "missing middle". This contrasts with more developed economies where medium sized

---

<sup>5</sup> The so-called township and village enterprises (TVEs).

<sup>6</sup> As defined here, enterprises with less than 5 employees.

<sup>7</sup> Predominantly household enterprises in the informal sector.



enterprise numbers are larger and their contribution to overall employment is significant, as well as being a major source of high growth firms that contribute importantly to employment growth. Consequently, a general economic development pattern is that at lower levels of economic development average firm size, as measured by employment, is low, increasing with economic development and movement to a factory system with industrialization that contributes to an increase in average firm size.

**Table 1. Number of Private Non-Agricultural SMEs as a Percentage of Total Firms, Selected APEC Countries, 1999 (%)**

	<i>Micro</i> ( <i>&lt;5 employees</i> )	<i>Small</i> ( <i>5-19 employees</i> )	<i>Medium</i> ( <i>20-99 employees</i> )	<i>All SMEs</i>
Australia	69.9	24.3	4.9	99.1
Chile	82.1	15.0	2.1	99.2
Hong Kong, China	86.8	7.6	4.9	99.3
Japan	56.5	34.7	7.4	98.6
Korea	72.7	17.8	8.6	99.1
Mexico	91.7	6.3	1.6	99.6
New Zealand	84.2	7.1	8.0	99.3
Peru	96.5	3.1	0.3	99.9
Philippines	91.1	8.2	0.4	99.7
Singapore	67.4	24.3	6.1	97.8
Thailand	79.0	18.4	2.0	99.4
USA	60.5	28.9	8.9	98.3

*Source:* Hall (2002a)

Table 2 indicates that SMEs generally contribute around 60-70 percent of private sector employment, and that this contribution tends to be proportionally more from medium sized businesses, defined as those employing between 20 and 99 people. Medium sized enterprises typically make up only about 4 percent of all enterprises (or about 20 percent of manufacturing enterprises) but they employ about 20 percent of the workforce (or about 30 percent of the manufacturing workforce). While there are a considerable number of micro businesses across the region, between 70-80 percent of all enterprises in the private sector, they do not contribute proportionally as much too overall employment. Typically only about 10 to 25 percent.

**Table 2. Contribution of Micro, Small and Medium Sized Enterprises to Private Non-Agricultural Employment, Selected APEC Countries (%)**

	<i>Micro</i> ( <i>&lt;5 employees</i> )	<i>Small</i> ( <i>5-19 employees</i> )	<i>Medium</i> ( <i>20-99 employees</i> )	<i>All SMEs</i>
Australia	25.9	20.9	19.2	66.0
Hong Kong, China	31.1	13.0	24.8	59.4
Japan	13.1	29.9	26.9	69.9
Korea	31.2	11.3	36.2	78.7
Mexico	36.2	13.9	15.2	65.2
New Zealand	23.0	18.0	19.0	60.0
Peru	62.5	16.6	8.8	87.9
Philippines	36.7	25.8	7.1	69.5
Singapore	7.1	16.8	19.2	43.1
USA	5.2	13.6	17.9	36.7

*Source:* Hall (2002a)

### ***Contribution to Sales, Output, Value Added***

Estimates of SME contribution to economic value added, sales, or output are difficult to obtain for the East Asian region, and more difficult to interpret in comparable terms. The contribution to GDP is particularly difficult to obtain, but SMEs have been typically estimated to contribute somewhere between 30 percent and 60 percent of GDP (Hall, 1995). Hall (2002a) shows that SMEs contribute about 50 percent of value added or sales on average, but that this ranges from about 30 percent to about 70 percent. Small and micro firms make a significant contribution in developing economies (about 50 percent of output in China and the Philippines for example), but less in the more developed economies.

SME wage payments typically make up over half of GDP in regional economies, and hence are important for domestic demand expansion, and for the generation of savings funds (Hall, 2000, p.2).

### ***Contribution to Exports***

There is very little information on regional SMEs that export and import goods and services. Hence reliable estimates of the proportion of exports generated by SMEs are traditionally difficult to obtain. Hall (1995, 2000) suggests that for the East Asian

countries SMEs generally contribute between 30-35 percent of direct exports<sup>8</sup>. However, this does vary widely across countries. Export growth rates are generally higher than GDP growth rates, and, where figures are available, the rate of growth of SME exports is higher than the growth of overall exports. This suggests that SMEs in Asia have already become significantly internationalized and becoming more so. It is difficult to gauge the importance of SMEs by size of firm because few countries keep such export statistics. In addition, many SME exports are made indirectly via a larger firm (arising from participation in a production network) or an agent and are difficult to attribute to SMEs even when statistics are kept. However, if we were to add direct and indirect exports by SMEs the figure could rise to close to 50 percent for the East Asian countries. In addition, SME foreign direct investment (FDI) is usually export oriented, thereby adding further to the potential for regional exports and technology transfer (Hall, 2000, p.2).

### ***Contribution of SMEs to Growth***

SMEs make a major contribution to economic and, particularly, employment growth. Most of the available evidence suggests that SMEs contribute about 60 to 70 percent of net employment growth, so they are an important “Entrepreneurial Engine”. This contribution has two main aspects. First, the net addition of new firms, net start-ups, generates economic growth. About 80 to 90 percent of SMEs are micro enterprises, and they “churn”; that is a significant proportion (between about 5 to 20 percent) “die” each year, while a similar proportion are “born” each year. If there is a net gain of births over deaths then this tends to add to overall economic growth, even though the average micro firm itself does not grow much in size. Second, it is the sustained growth of a relatively small group of successful (or high growth) firms that contributes significantly to economic growth. These firms typically survive for more than eight years, and often experience growth rates exceeding 30 percent per annum. It is only a relatively small percentage of SMEs (perhaps 5 percent or less) that contribute significantly to overall growth in this way, but their contribution can be quite large (see Hall, 2002a).

---

<sup>8</sup> The equivalent figure for selected OECD countries, where estimates and statistics were available, was 26 percent.

### ***Some Key Observations***

A number of observations can be made about the contribution of SMEs as the Entrepreneurial Engine of East Asia (see Hall, 2002a). First it is clear that SMEs do provide the lion's share of **employment growth**. Typically, in the economies for which there are reliable data, about 70 percent of employment growth comes from SMEs. Anecdotally, even in economies for which there is no data, SMEs play a major role; for example almost all net employment creation in China, Vietnam and Indonesia in the last five to ten years has been in SMEs. In China and Indonesia, for example, large firms have been net job destroyers as they downsize - a phenomenon also common in Europe and the USA.

Second, the **Entrepreneurial Engine is underpowered** in much of East Asia, especially in the less developed economies of China, Indonesia, Philippines, Thailand and Vietnam (see Harvie and Lee, 2002). In these economies there are simply fewer SMEs than might be expected. This means that there are fewer start-ups, and the pool of SMEs from which high growth SMEs can emerge is much smaller. Consequently, there is less growth than there would otherwise be. In a *very* rough order of magnitude calculation, for these economies to achieve a benchmark level of 20 people per SME, there would have to be about 70 million new SMEs created. This needs to be compared with the 20 million or so SMEs in *all* of East Asia at present. This means 70 million or more people will need managerial skills and training. Most of these are in China. There is also considerable room for advancement in the development of SMEs in countries such as Indonesia and Thailand, two of the three most adversely afflicted economies during the period of the financial and economic crisis of 1997-98. Not surprisingly, these countries have given increased emphasis to SME sector development, with the objective of providing a firm base for sustainable economic recovery, an expansion in employment opportunities, and as a means of alleviating poverty particularly in some of the more adversely affected regions in these countries. This situation is also similar to that in China and Vietnam, where, for historical, political, and cultural reasons, the development of the SME sector has also been retarded. Hence the sheer potential for SME start-ups in countries such as China, Indonesia and Vietnam could be a major source of job creation and growth for these economies in the future. In economies like

Vietnam and Philippines, there need to be about 3 million or more additional entrepreneurs/managers. In the past this would be seen as a government responsibility, but the task is just too enormous to even contemplate for most governments. Changing technology (notably the www, and especially WAP access to the www) are changing this, and making it more feasible for the private sector to train large numbers of entrepreneurs/managers in a relatively short period of time, but it will still need public-private cooperation to achieve the sort of growth that is needed (see Hall, 2002a).

Third, in developing East Asia the bulk of the SME contribution to growth will probably come from **net start ups** while in developed East Asia the growth contribution will tend to come more from **high growth firms**. Start-up rates tend to be relatively low, especially in Japan, which is the largest economy in East Asia (just). Japan's net start up rate (domestically at least) has been negative for some time. Part of this is due to the country's prolonged economic downturn, and part of it is cultural and institutional inhibitions to risk taking and starting a business. These cultural and institutional factors need to be actively addressed if East Asia is to really make use of the potential of its Entrepreneurial Engine.

Fourth, the **Entrepreneurial Engine is becoming increasingly internationalized**. For example, a small but significant proportion of SMEs in Japan, Korea and Chinese Taipei have already expanded operations abroad; about 13 percent of Japan's manufacturing output is now sourced abroad. It is becoming easier for SMEs to operate across borders. This is partly as a result of efforts to reduce trade and non-trade impediments by the WTO, APEC and ASEAN. It is also part of the general globalization of business occurring as a result of improved communications (particularly e-commerce and the web), other technological and social changes, and product fragmentation and the development of production networks. This SME internationalization is not limited to specific regions, such as East Asia, but is more global.

Table 3 elaborates upon and provides a summary of key common features, differences and policy issues, in the profile of SMEs in East Asia/APEC discussed in this section.

**Table 3. A Summary Profile of SMEs in East Asia/APEC**

	<b>Key Features</b>	<b>Regional Differences and Policy Issues</b>
Numbers of Enterprises	<p>1. There are about 20 to 30 million SMEs in East Asia.</p> <p>2. They account for 98% of all enterprises.</p> <p>3. Micro-enterprises account for about 73% of all private sector enterprises.</p> <p>4. On average there are about 85 people for every SME.</p>	<p>1. Most of the SMEs are in China (8 million) and Japan (5 million) and Korea (2.6 million) which together have 70% of the SMEs in East Asia.</p> <p>2. In developed economies there are only about 20 people per SME, but the ratio is above 100 in the developing economies, especially in China, Vietnam, Philippines and Indonesia.</p>
Employment	<p>5. SMEs employ about 60% of the private sector workforce, and 30% of the total workforce.</p> <p>6. Micro-enterprises employ about 21% of total APEC wide employment.</p> <p>7. Over 95% of enterprises employ less than 100 people, and over 80% employ less than 5 people.</p> <p>8. SMEs contribute about 70% of net employment growth.</p> <p>9. SMEs provide about 80% of employment in the services sector, and about 15% in the manufacturing sector.</p> <p>10. Women make up about 30% of employers/self employed in APEC – mainly in micro-enterprises</p>	<p>3. In developing economies (below about \$15,000 USD per head income) SMEs employ about 75% of people, above \$15,000 the level is closer to 50%. Japan is a major exception - Japan's SMEs employ around 80% of the workforce.</p> <p>4. More developed economies seem to have more medium sized SMEs and they play a greater role. Developing economies seem more likely to have a “missing middle”.</p> <p>5. In developed economies most of this growth probably comes from fast growth firms, in developing economies a higher proportion probably comes from net start ups.</p>
Output measures (sales, value added etc)	<p>11. SMEs contribute about 50% of sales, value added or output.</p>	<p>6. The contribution varies from lows of 15% (Singapore) and 30% (Australia) to about 60% for most other economies.</p>
Exports	<p>12. SMEs generate about 30% of direct exports (US\$930 billion in 2000), much less than the SME contribution to employment (about 60% to 70%) or output (about 50%).</p>	<p>7. SME exports figures are difficult to verify, but they range from about 5% or less (Indonesia) to around 40% (Korea) of total exports.</p> <p>8. Tariff cuts have increased total APEC</p>

	13. SMEs contribute indirectly to trade through supply chain relationships with other firms. SME contribution to total trade could rise to 50%.	member trade, but the SME contribution to direct exports has remained static or declined. Reductions in tariffs have not benefited SMEs, more emphasis needs to be put on tackling non tariff barriers if SMEs are to benefit from trade expansion.
FDI	14. SMEs generate about 50% of cases of FDI, but only less than 10% of value of FDI.	9. Korean, Japanese and Chinese Taipei SMEs contribute most FDI originating in the East Asian region.
Entrepreneurial Engine, international potential, and the new economy.	15. SMEs already contribute the bulk of growth, and SMEs could make a much bigger contribution to the Asian regional economy if efforts were made to address impediments to SME internationalization. This could add as much as \$1.18 trillion in trade over a 5 year period. 16. SMEs moving towards services and away from agriculture and manufacturing.	10. The developing economies need to create about 50 to 70 million more SMEs if they are to achieve “benchmark” levels of SME activity. 11. To achieve maximum gain from trade it is essential to improve governance, building capacity, reducing transaction costs, promoting further liberalization, addressing non tariff barriers, increasing internet access and facilitating trade and investment to improve the capacity of SMEs to export. 12. Capacity building includes: access to finance; improved professional skills (IT, management, accounting and entrepreneurship); improved business infrastructure; removal of trade barriers that particularly adversely affect SMEs. 13. E-commerce use of SMEs lags larger enterprises. Important for cost saving and growth potential. Usage of technology a problem due to: set up and usage costs; lack of adequate infrastructure and IT skills.

Source: Hall (2002a, 2002b), supplemented by information from APEC (2002) and by the authors.

### *A Caveat*

While the region has a significant and sizeable SME sector, this contribution varies by country and depends upon a number of factors, which should be borne in mind when conducting cross country comparisons, such as: resource endowments; transaction costs; economic structure and the extent of market concentration; economies of scale; stage of

economic development (at an early stage of development the economy is dominated by a large number of informal micro-enterprises and a small number of large enterprises. There is a ‘missing middle’ consisting of medium sized enterprises. This generally only happens at a later stage of economic development); institutions (government and market); culture, including the **nature and extent of domestic entrepreneurialism and innovation**; history; heterogeneity of the SME sector itself; the extent of **market liberalization and competition**; and **market friendly and supportive** government policies.

### **3. International Production/ Distribution Networks in East Asia - the Context**

Since the early 1990s international production/distribution networks have developed rapidly in East Asia, driven by market forces and facilitated by regional, sub-regional and bilateral free trade agreements (FTAs). These have resulted in a production-process wise regional division of labour and production location across countries with different income levels and development stages, and a significant shift away from a traditional north-south pattern of trade to one in which there has been a rapid increase in vertical intra-industry trade, particularly in parts and components in the machinery industries<sup>9</sup>, which is gradually dominating trade within the region. Associated with this development FDI flows have moved from import substituting industries and export oriented confined to export processing zones from which the domestic economy was insulated, to export oriented network forming type FDI (see Ando, 2006; Ando, Arndt and Kimura, 2006). In Southeast Asia the Philippines, Singapore, Malaysia and

---

<sup>9</sup> Machinery industries, as defined here, include general machinery, electric machinery, transport equipment and precision machinery (HS Codes (Harmonized System Codes) 84-92). These industries require the production of many parts, components and related technologies, highly suitable for the establishment of production networks. While the development of production networks can also be observed in other industries such as that of chemicals, textiles and garments, software and services, the machinery industry is by far and away the most important in magnitude, quantitatively and qualitatively, at this point in time. The proportion of machinery exports in total exports, particularly machinery parts and components exports is a good indicator for judging the degree of participation in international production/distribution networks.



Thailand actively import and export machinery parts and components, as is the case for Northeast Asia (China, Japan and Korea). While less developed, there are also clear indications that Indonesia, Vietnam, Myanmar, Cambodia and Laos are increasingly participating in regional production networks, but more is required in this context. A greater understanding is required of the nature of these international production/distribution networks in East Asia, their implications for trade and FDI and policy implications for less developed countries in Southeast Asia. In the context of this study, it is of particular interest to identify the challenges and opportunities they provide for the SME sector across these various economies.

The formation of international production/distribution networks has fundamentally changed the pattern of production location and international trade in East Asia. International trade statistics show that economic integration within the region has developed rapidly. The share of intra-East Asian trade, where East Asia is defined as ASEAN, China, Japan, Hong Kong, South Korea and Taiwan, increased from around 33.6 per cent in 1980 to 53.3 per cent in 2003. This figure is higher than that for NAFTA (44.5 per cent) and less than that for the EU (60.3 per cent) (see Figure 1). While the Asian financial crisis of 1997-98 did not interrupt this process of integration, the current global economic crisis seriously impacted the exports of East Asian export oriented economies because final demand in the US and Europe sharply declined. The regional production network should resume once there is sustained global economic recovery, albeit at a lower level compared to the pre-crisis period. An interesting development is that countries at a relatively lower income level are increasingly playing a significant role in the expansion of intra-regional trade in East Asia.

The trade pattern inside East Asia has changed from the traditional pattern where final products such as consumer goods, intermediate goods and capital good were predominant in trade to one where predominance is now given to parts and components (Lim and Kimura, 2008; Athukorala and Kohpaiboo, 2009) (see Figure 2). Intermediate goods in the same industry are now traded amongst Asian countries expanding intra-industry and intra regional trade. For instance, import shares of parts and components within East Asia increased from 7.2 per cent in 1980 to 32.2 per cent in 2003, while those of processed goods decreased from 37.3 per cent to 28 per cent during the same years. The shares of parts and components have become the largest traded commodity

groups (see Figure 2). This explosion of trade in intermediate goods, particularly in the machinery industries, is based on a production and process wide international division of labour among countries at different income levels and development stages. Trade patterns have now become quite different from the traditional pattern based on static comparative advantage. Production processes now involve sequential production blocks that locate across countries. Different stages of production are located in different countries and undertaken by different firms, consequently products traded between different firms in different countries are components instead of final products. While networks can be formed in various industries the most important in East Asia, both quantitatively and qualitatively, are those in the machinery industries, including general machinery, electric machinery, transport equipment and precision machinery (HS 84-92) (Kimura, 2009). The machinery industries deal with a large number of multi-layered vertical production/ distribution processes and technology, ideal for the development of cross border production/ distribution networks.

This phenomenon is known as cross border production sharing or **fragmentation of production**. Production processes are finely sliced into many stages and located in different countries in East Asia. With such vertical specialization, a slight decline in trade costs induces large trade in intermediate goods since goods may move across national borders multiple times. For example, an intermediate good is exported from country A to country B and is imported back to country A again after processing in country B. In this case, the good crosses a national border four times. When trade costs go down, the competitiveness of the whole of East Asia considerably increases.

Literature on the **fragmentation theory** and its empirical verification expanded rapidly after the seminal contribution of Jones and Kierzkowski (1990)<sup>10</sup>, proving its applicability in analysing cross border production sharing at the production process level (Ando and Kimura, 2005a). From an East Asian perspective, however, production/ distribution networks have become quite distinctive and the most developed in the world (Ando and Kimura, 2005b) as measured by: their significance for each economy in the region; their extensiveness in terms of country coverage; and their sophistication which can involve subtle combinations of intra-firm and arm's length (inter-firm)

---

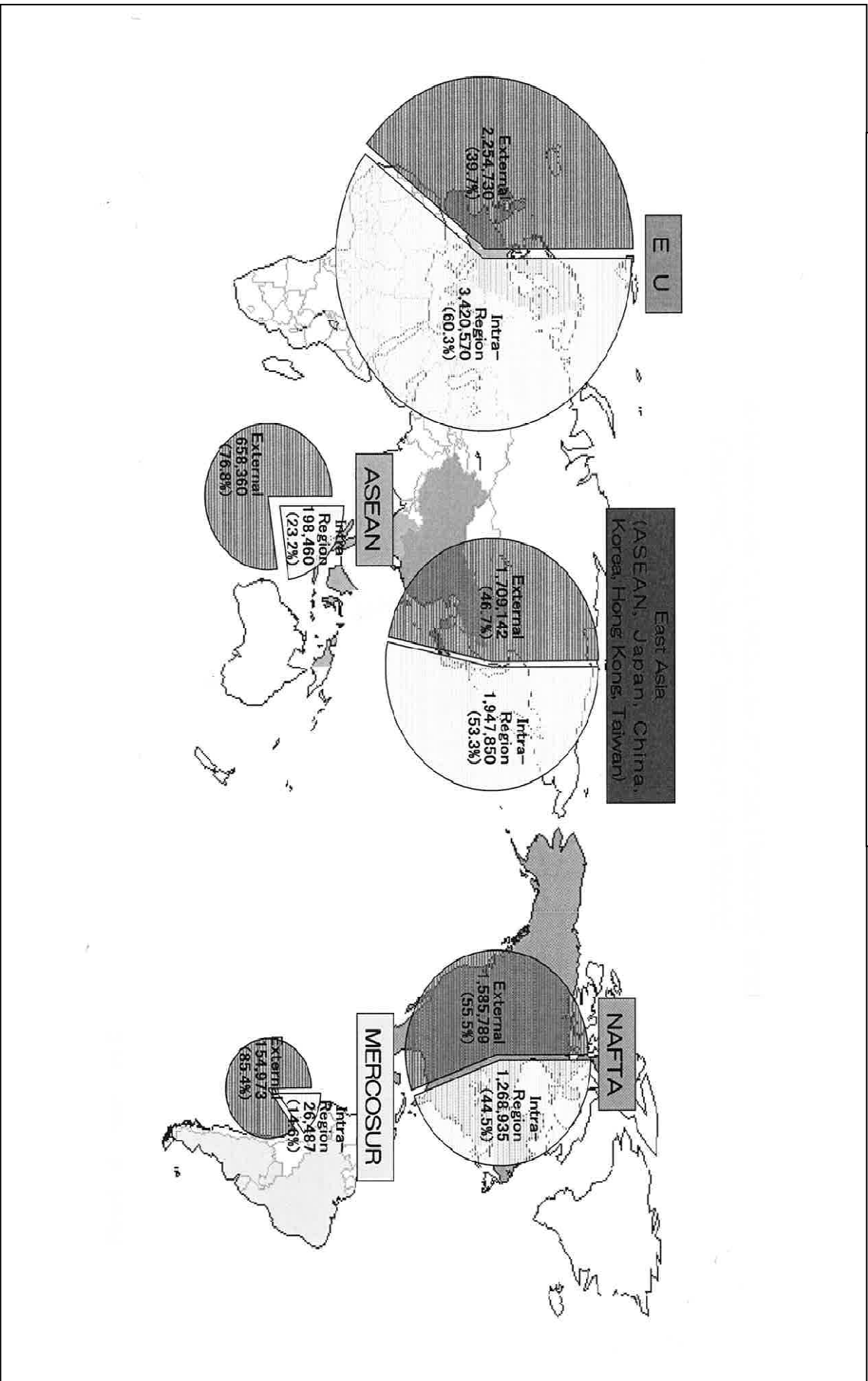
<sup>10</sup> See also Arndt and Kierzkowski (2001), Deardorff (2001) and Cheng and Kierzkowski (2001) for further elaboration of the fragmentation theory.

transactions. Consequently, these networks have developed beyond the original idea of fragmentation, requiring a re-appraisal and expansion of the original analytical framework in order to capture more subtle and sophisticated intra-firm and arm's length (inter-firm) transactions. In this context Kimura and Ando (2005) propose the concept of two dimensional fragmentations to analyse the mechanics of production/ distribution networks in East Asia<sup>11</sup>. We return to this below in the context of SME participation in the regional production/ distribution networks.

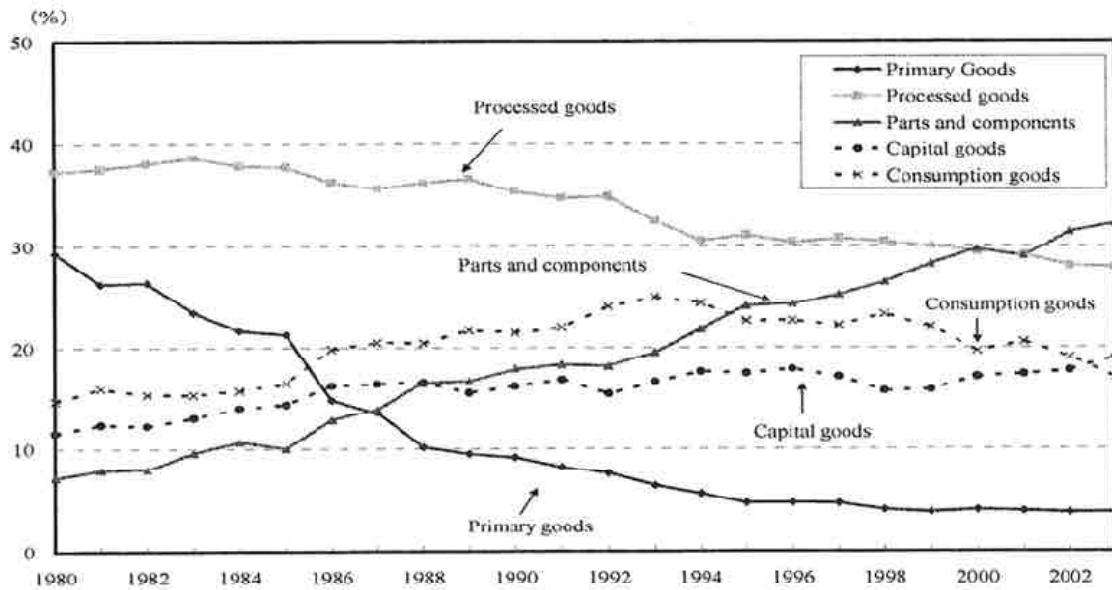
---

<sup>11</sup> An extensive discussion of this two dimensional fragmentation can also be found in Kimura and Ando (2005), especially pages 7-13.

Figure 1 Intra regional trade in East Asia



**Figure 2. Trade Patterns within East Asia 1980-2003**



Source: UN Comtrade

Fragmentation theory focuses on the location of production processes. Production processes are fragmented or separated into multiple slices and located, say, in different countries in East Asia, and makes sense when (i) there is **production cost saving in fragmented production blocks**; whereby the firm can take advantage of **differences in location advantages** between the original position and a new position. Second, incurred **service link costs** involved in connecting remotely located production blocks i.e. costs of transportation, telecommunications and various other types of coordination are low. Third, the cost of **network set-ups is small**. The feasibility of fragmented production/distribution (location and by firm) in an industry is heavily influenced by: the number of parts and components required in the production of the final product; the greater the variety of technologies utilized in the production of these parts and components (labour intensive, capital intensive); and the economic environment within individual countries and for the region as a whole. International production/distribution networks in ASEAN and surrounding East Asia have become the most advanced and sophisticated in the world in large part due to the existence of a favourable policy environment for globalizing corporate activities. By incorporating the idea of intimacy

between geographical proximity and arm's length transactions, the framework of product fragmentation can explain the simultaneous development of firm level fragmentation of production processes and the industry level formation of agglomeration. A reduction in production costs in fragmented production blocks, reduced service links costs and lower network set-up costs will all contribute to the further fragmentation of production/distribution networks.

Kimura and Ando's (2005) two dimensional fragmentation framework is particularly illuminating in explaining the growth of East Asian production/distribution networks. Product fragmentation here has two dimensions: fragmentation based on distance; fragmentation based on firm disintegration. There are advantages and disadvantages arising from both these forms of fragmentation. Table 4 summarizes these trade-offs.

What can be learned from Table 4 is that **fragmentation by distance**, involving intra and/or inter firm fragmentation (both domestic and cross border) will likely **increase service link costs** (greater transportation, telecommunications, logistics, distribution, coordination and cross border) but have the potential to **reduce production costs** from location advantage (wages, access to resources, lower utility costs, access to technological capability). **Fragmentation by firm disintegration** involving intra and/or inter firm fragmentation (both domestic and cross border) is likely to increase service link costs (related to loss of control and lack of trust) and include: additional information costs in seeking a suitable partner, monitoring cost, contract costs, dispute settlement costs, legal costs, legal and institutional system deficiencies. However this is potentially offset by reduced production costs due to the increased availability of business partners both domestic and foreign, the development of supportive industry, institutional capacity for various types of contracts and the degree of complete information. It is, therefore, apparent that reductions in service link and production costs can trigger a further rapid expansion in product fragmentation.

As the development and sophistication of production/distribution networks expand, SMEs have the opportunity to play a crucial role both as indigenous and foreign based firms in the network on an arm's length basis in various forms, including subcontracting arrangements and OEM contracts. SMEs are also essential components of industrial agglomeration. In this context, not only multi-national SMEs but also local SMEs can

be important participants in a vertical arm's length division of labour. This important role is discussed in the following sub-section.

**Table 4. Trade-offs in two dimensional fragmentations**

	<b>Service link cost connecting production blocks</b>	<b>Production cost in production blocks</b>
Fragmentation by distance (intra and inter firm, domestic and foreign)	Cost will increase with geographical distance: <ul style="list-style-type: none"> <li>• Transportation, telecommunications, logistics and distribution (inefficiency)</li> <li>• Trade impediments</li> <li>• Coordination cost</li> </ul>	Cost reduction from location advantage: <ul style="list-style-type: none"> <li>• Wage costs</li> <li>• Access to resources</li> <li>• Infrastructure service inputs (utilities, industrial estates)</li> <li>• Technology capability</li> </ul>
Fragmentation by firm disintegration	Increased transaction costs from loss of control/trust: <ul style="list-style-type: none"> <li>• Information cost from seeking suitable business partner.</li> <li>• Monitoring cost</li> <li>• Contract costs</li> <li>• Dispute settlement cost</li> <li>• Legal system and institutional system deficiencies</li> </ul>	Cost reductions from disintegration: <ul style="list-style-type: none"> <li>• Availability of various types of potential business partners including foreign and indigenous firms</li> <li>• Development of supporting industry</li> <li>• Institutional capacity for various types of contracts</li> <li>• Degree of complete information</li> </ul>

*Source:* Kimura and Ando (2005)

#### **4. International Production Networks and SMEs – Opportunities and Challenges**

Given the ongoing trend of increased globalization and regional economic integration in East Asia, significant potential exists for regional SMEs to expand their participation in regional production/distribution networks or global value chains. As discussed previously, however, they possess certain characteristics that may limit their

ability to do so<sup>12</sup>. First, they face a **lack of access to finance** due to market failures in financial markets, particularly in the banking sector, and limited primary and secondary markets such as those for SME equity and bond financing. The formal banking system remains the dominant source of credit for local businesses in the region. Worsening the problem, the current economic crisis has increased risk aversion and decreased liquidity. In response, governments have made substantial efforts to allocate formal-sector resources to support SMEs through measures such as subsidies and safeguarding banks. However, SMEs still struggle to secure long term bank loans, working capital and bridge financing. Expanding access to and options available to SMEs is important. Second, the SME sector's development is constrained by a **lack of skill and expertise in organisation and management**, which are important for enterprises' efficiency, flexibility and competitiveness (Asasen et al., 2003). The need for competent, contemporary management is compounded by the fact that drastic economic and technological developments have created new and modern ways of production and service delivery. Related to this is the issue of ICT capability in which SMEs clearly lag. Third, there is a shortage of **sustainable entrepreneurial drive** in the sector. This can be attributed to a **weak innovation culture and to an over-reliance on technologies brought in by MNCs**. Entrepreneurship capabilities are crucial for SMEs to maximise their inherent comparative advantages gained from operating on a small scale, such as the flexibility to adapt to changing markets, helping them sustain high levels of export competitiveness. Finally, there is a lack of **networking**. Many SMEs are inward looking. Networks and linkages require fundamental shifts in business strategies that SMEs may not be able to achieve because of a **lack of resources and knowledge**<sup>13</sup>.

---

<sup>12</sup> It is important to emphasise here, however, that SMEs are highly heterogeneous. Some are extremely innovative and at the cutting edge of their industry/technology, while the vast majority of SMEs possess little likelihood of growth and lack innovation and entrepreneurial drive. Consequently, only some SMEs of the total cohort have the potential to participate in such production/distribution networks.

<sup>13</sup> These issues are explored in more detail in Chapter IV.



### ***The Process of SME Integration into Production/ Distribution Networks or Value Chains***

In our previous discussion of production/distribution networks in East Asia emphasis was placed on the importance of product fragmentation, in terms of distance and firm disintegration, and the implied costs and benefits arising from this. Such costs and benefits arise from inter-firm (arm's length) rather than intra firm dealings and the role and importance of location (distance). However, the establishment of such production/distribution networks is, more usefully, seen as being multi-tiered in nature. Consequently, we can argue that production/distribution networks are part of a global production value chain. Global value chains can be interpreted as a broader concept than production/distribution networks. Global value chains are evolving tiered structures. The main role is traditionally played by a lead firm (multi-national enterprise) that manufactures the final product (Original Product or Equipment Manufacturer). This firm is supported by a small number of preferred first tier suppliers, which are supplied by other suppliers and so on, forming a tiered structure consisting of large and small enterprises. It is generally easier to enter a network as a lower tier supplier. But this position tends to be unstable as it can be easily replaced by other suppliers that offer better comparative advantages such as lower costs (Abonyi, 2005). The challenge facing SMEs is two dimensional. First, to try and **enter a global value chain**, and, second, to also **move up the tiers** by upgrading the added value content of their activities.

### ***Emerging Business Opportunities for SMEs in the Region***

Multi-national corporations have expanded their production, material and resources sourcing and markets beyond their domestic economies. Because of pressures from **economic integration, competition** and the **Just in Time (JIT) production system**, the region has now become fully connected into a Global Value Chain system which produces output for the global market place. As a result, globalization provides new opportunities for developing countries to enter international trade through production sharing and outsourcing. The international production networks developed from the early 1990s in East Asia are gradually spreading to India, Australia and New Zealand, driven by market forces and facilitated by regional, sub-regional and bilateral FTAs.

The fragmentation phenomenon suggests that differences in location advantages such as factor prices motivate fragmentation of the production process. Therefore, regional economic integration has set off dynamic growth impulses through global and regional production networking. This process has been facilitated by industrial agglomeration and fragmentation in sequential order.

Globalization and regional integration are developing rapidly. Countries most able to take advantage of these two underlying fundamental forces have been growing faster and more sustainably. At the same time, economic openness and domestic trade and investment liberalisation have dramatically increased competition in domestic, regional and global marketplaces. Larger and efficient companies are normally more able to leverage these new opportunities and challenges in domestic markets as well as across borderless external markets. This challenging new economic environment tends to put SMEs at a disadvantage compared to large-medium sized enterprises. However, the fact is that large and small-medium enterprises are the two important engines and wheels of development in East Asia. While MNCs and domestic large enterprises have been playing an important role in accelerating the industrialization process, SMEs provide the crucial industrial linkages to set off a chain reaction of broad based and sustainable development. Without SMEs as subcontractors and suppliers of intermediate inputs to MNCs and domestic large enterprises, industrial growth in developing countries and a sustained increase in domestic value added, employment, productivity and industrial linkages cannot be achieved. SMEs provide a key source of domestic employment creation, resilience against more volatile external economic fluctuations and mechanisms for local capacity building.

SMEs play a pivotal role in the functioning of international and regional production networks. Local SMEs can be fostered by utilizing globalizing market forces and regional economic integration. The issue is how to provide a critical linkage between SMEs and large local and MNCs. Governments will likely have to play a vital role in ensuring competitive market structures, in providing relevant and effective technical upgrading, marketing information and management, consortium financing and clustering (economies of scale) to SMEs.

Evidence exists to suggest that local firms and SMEs are participating in production and distribution networks, particularly in the electronics, machinery, ICT, automobile

and service industries. Local SMEs are participating in producing not only parts and components but also industrial equipment. Economic integration has provided business opportunities in not only participating in production and distribution networks but also in capturing expanded domestic and external markets. Local firms and SMEs have succeeded in establishing linkages with MNCs (either directly or indirectly) and expanding their business in integrated markets. The attainment of more dynamic, rapid and sustainable regional economic development requires the development of SMEs. To achieve this there is a need to improve the international competitiveness of SMEs through R&D, improved quality control and skills. Governments should promote the development of local parts and supplier industries. This is likely to be an effective strategy to expand the domestic content of MNCs operating in the country. The development of domestic suppliers, together with access to and availability of finance, along with increased linkages between SMEs and large enterprises are also important.

As regional production networking becomes a more important source of economic growth, outsourcing and subcontracting offer increasing opportunities for SMEs to leverage increased regional economic integration. Another important emerging business opportunity for SMEs is the advent of internet business and the widespread use of electronic and computer business design. SMEs are also expanding very rapidly in the service sectors of tourism, specialized marketing to newly emerging markets beyond the domestic market as the process of regional economic integration accelerates. Without an improvement in the efficiency of local firms and SMEs, regional integration cannot be sustained as there will be more domestic opposition and economic and social instability in countries that experience increasing unemployment. This is the crux of regional economic integration and sustainability. It must not only increase efficiency but also provide positive and acceptable benefits to every constituent member of the free trade area or economic community.

Regional economic integration will generate higher economic growth, but employment may not expand as rapidly. In addition, regional integration may tend to increase income disparity among members of the preferential trading area, if some countervailing measures are not properly instituted. In this respect the development of viable and sustainable SMEs provides an effective measure to counter the negative effects of globalization and regional economic integration. Therefore, improving the

competitiveness and capability of SMEs is vital for the sustainability of regional economic integration. Countries at different stages of economic development require different focus and core policy instruments aimed at improving the capability of their SMEs. Technology and industry upgrading are the core measures that must be continually implemented in order to be competitive, in addition to clustering and improved marketing capability. Development of the technological capability of SMEs is an integral policy for liberalizing the trade and investment regime. Regional economic integration opens up opportunities and challenges for policy makers to provide industrial and technological upgrading for SMEs. SME capacity building is discussed in more detail in Chapter IV.

## **5. Summary and Conclusions**

SMEs represent an integral part of the economies of East Asia. They make significant contributions to the economy from many perspectives – output, growth, employment, exports, poverty alleviation and economic empowerment. Globalization and regional economic integration present them with many challenges as well as opportunities. Of particular interest are the opportunities for regional SMEs to participate in regional production networks. Not all SMEs will be suitable for such participation, but it is clearly of considerable interest for governments, and for protagonists of further regional integration, to identify those SMEs most conducive for production network participation. As previously indicated the future success of regional economic integration is likely to depend upon mutual benefits for participation nations. One way of ensuring that economic growth from such integration is translated into employment growth is through developing SME sector capacities to enable them to participate effectively in regional production networks.

## References

- Abonyi, G. (2005) "Transformation of Global Production, Trade and Investment: Global Value Chains and International Production Networks", paper presented to the Expert Group Meeting on SMEs' Participation in Global and Regional Supply Chains, UNESCAP, Bangkok, November.
- Acs, Z.J. and Audretsch, D.B. (1990), *Innovation and Small Firms*, The MIT Press, Cambridge, Massachusetts.
- Ando, M. (2006), "Fragmentation and Vertical Intra-Industry Trade in East Asia", *North American Journal of Economics and Finance*, 17(3), pp.257-281.
- Ando, M. and Kimura, F. (2005a), "Global Supply Chains in Machinery Trade and the Sophisticated Nature of Production/Distribution Networks in East Asia, Mimeo. Available at <http://www.coe-econbus.keio.ac.jp/data/DP2005-015.pdf>.
- Ando, M. and Kimura, F. (2005b), "The Formation of International Production and Distribution Networks in East Asia", in T. Ito and A.K. Rose (eds.), *International Trade in East Asia*, pp.177-213, University of Chicago Press, Chicago.
- Ando, M., Arndt, S.W. and Kimura, F. (2006), "Production Networks in East Asia: Strategic Behaviour by Japanese and U.S. firms", paper presented at the Japan Centre for Economic Research, Tokyo, June.
- Arndt, S.W. and Kierzkowski, H. (2001), *Fragmentation: New Production Patterns in the World Economy*, Oxford University press, Oxford, UK.
- APEC (1998), Profile of SMEs in East Asia, (available at <http://www.actetsme.org>)
- APEC (2002), Expanding the Benefits of Cooperation for SMEs, Joint Ministerial Statement, 9<sup>th</sup> APEC Small and Medium Enterprise Ministerial meeting, Acapulco, Mexico, August.
- Asasen, C., Asasen, K. and Chuangcham, N. (2003), A proposed ASEAN policy blueprint for SME development 2004–2014. REPSF Project 02/005 33, 145 pp.
- Athukorala, P.C. and Kohpaiboon, A. (2009), Intra-regional Trade in East Asia: the Decoupling Fallacy, Crisis and Policy Challenges, ANU Working Paper in Trade and Development, 2009/09.
- Basri, Faisal H. (1994), Manufacturing Industry in the National Economy: Position of Small Scale Business, in Rahardjo, M Dawam (ed) (1994) Small Business in the Indonesian Economy, Ministry of Cooperatives and Small Enterprise of the Republic of Indonesia, Jakarta, p 165 - 177.
- Brusco, S. (1990), The idea of the Industrial District: its Genesis, in F. Pyke, G. Becattini and W. Sengenberger (eds.), *Industrial Districts and Inter-firm Cooperation in Italy*, International Institute for Labour Studies, Geneva.
- Cheng, L.K. and Kierzkowski, H. (2001), *Global Production and Trade in East Asia*, Kluwer Academic Publishers, Boston.

- Davis, S.J. Haltiwanger, J. and Schuh, S (1993), *Small Business and Job Creation: Dissecting the Myth and Reassessing the Facts*. National Bureau of Economic Research, Working Paper No 4992, Cambridge AM.
- Deardorff, A.V. (2001), "Fragmentation in Simple Trade Models", *North American Journal of Economics and Finance*, 12, pp.121-137.
- Doeringer, P. B. and Terkla, D. G. (1995), "Business strategy and cross-industry clusters", *Economic Development Quarterly*, Vol.9, No.3, pp.225-37.
- Doeringer, P. B. and Terkla, D. G. (1996), Why do industries cluster?, in by U. H. Staber et al. (eds.), *Business Networks: Prospects for Regional Development*, Walter de Gruyter, Berlin.
- Hall, C. (1995), APEC and SME policy: suggestions for an action plan (available at <http://www.arts.monash.edu.au/ausapec/smepolic.html>)
- Hall, C. (1999) Using the International Entrepreneurial Engine to Restart Asian Growth, in Leo Paul Dana (ed) *International Entrepreneurship, an Anthology*, NTU Entrepreneurship Development Centre, Singapore.
- Hall, C. (2000) E-commerce and SMEs in APEC – HRD implications and the role of PECC, Paper presented to the ninth annual meeting of PECC – HRD, Pacific Economic Cooperation Council Human Resource Development Task Force, Hua, Taiwan, October 21-22.
- Hall, C. (2002a) Profile of SMEs and SME Issues in East Asia, in C. Harvie and B.C. Lee (eds.), Chapter 2, pp.21-49, *The Role of Small and Medium Enterprises in National Economies in East Asia*, Edward Elgar, Cheltenham, UK, Chapter 2, pp.21-49.
- Hall, C. (2002b) Small business and trade in APEC, a report prepared for the APEC Ministers Responsible for Trade Meeting, Puerto Vallarta, Mexico, 29-30 May 2002.
- Hallberg, K. (2000) A Market-Oriented Strategy for Small and Medium-Scale Enterprises, IFC Discussion Paper No. 40, World Bank, Washington, D.C.
- Harvie, C. (2002) The Asian Financial and Economic Crisis and Its Impact on Regional SMEs, in C. Harvie and B.C. Lee (eds.), *Globalization and Small and Medium Enterprises in East Asia*, Edward Elgar, Cheltenham, UK, Chapter 2, pp.10-42.
- Harvie, C. (2008) "SMEs in Regional Trade and Investment Development", in Tran Van Hoa and C. Harvie, *Regional Trade Agreements in East Asia*, Chapter 9, pp. 149-186, Edward Elgar, Cheltenham, UK.
- Harvie, C. and Lee, B.C. (2002) (eds.) *The Role of Small and Medium Enterprises in National Economies in East Asia*, Edward Elgar, Cheltenham, UK.
- Harvie, C. and Lee, B.C. (2005) "Introduction: the role of small and medium-sized enterprises in achieving and sustaining growth and performance (with B.C. Lee), in C. Harvie and B.C. Lee (eds.), *Sustaining Growth and Performance in East Asia: the role of small and medium sized enterprises*, *Studies of Small and Medium sized Enterprises in East Asia*, Volume III, Chapter 1, pp. 3-27, Edward Elgar, Cheltenham, UK..

- Hill, Hal, (1995) "Small and Medium Enterprise and Rapid Industrialization: the ASEAN experience, *Journal of Asian Business*, Vol.11, No.2, pp.1 - 30.
- Jones, R.W. and Kierzkowski, H. (1990) "The Role of Services in Production and International Trade: a Theoretical Framework", in R.W. Jones and A.O. Krueger (eds.), *The Political Economy of International Trade: Essays in Honour of R.E. Baldwin*, pp.31-48, Basil Blackwell, Oxford, UK.
- Kimura, F. (2009) "The Nature and Characteristics of Production Networks in East Asia: Evidences from Micro/Panel Data Analyses, Research Unit for Statistical and Empirical Analysis in Social Sciences (Hi-Stat), Discussion paper series 093, December.
- Kimura, F. and Ando, M. (2005) "Two-dimensional Fragmentation in East Asia: conceptual Framework and Empirics", *International Review of Economics and Finance (special issue)*, 14(3), pp.317-348.
- Krugman, P. (1991) *Geography and Trade*, MIT Press, Cambridge.
- Lim, H. and Kimura, F. (2009) "The Internationalisation of SMEs in Regional and Global Value Chains", paper presented at the LAEBA Fifth Annual Conference, Singapore, 15 July.
- Marshall, A. (1920) *Principles of Economics*, 8<sup>th</sup> edition, Macmillan, London.
- Mishan, E. (1971) "Externalities", *Journal of Economic Literature*, Vol.9, pp.1-28.
- OECD (1997) *Globalization and SMEs*, Vol. 1 and 2, OECD, Paris.
- OECD (2000a) *Enhancing the Competitiveness of SMEs through Innovation*, Workshop paper No. 1, Bologna Meeting, OECD, Paris.
- OECD (2000b) *Local Partnership, Clusters, and SME Globalization*, Workshop paper No. 2, Bologna Meeting, OECD, Paris.
- OECD (2000c) *Realizing the Potential of Electronic Commerce for SMEs in the Global Market*, Workshop paper No. 3, Bologna Meeting, OECD, Paris.
- Piore, M. J. and Sabel C. F. (1984), *The Second Industrial Divide - Possibilities for Prosperity*. USA: Basic Books.
- Porter, M.E. (1990) *The Competitive Advantage of Nations*, The Free Press, New York.
- Porter, M.E. (1998) "Clusters and the new Economics of Competition", *Harvard Business Review*, pp.77-90.
- Pyke, F., Becattini, G. and Sengenberger, W. (1990) (eds.) *Industrial Districts and Inter-firm Cooperation in Italy*, International Institute for Labour Studies, Geneva.
- Pyke, F. and Sengenberger, W. (1992) *Industrial Districts and Local Economic Regeneration*, International Institute for Labour Studies, Geneva.
- Rabellotti, R. (1995) "Is there an 'industrial district model'?" Footwear districts in Italy and Mexico compared, *World Development*, Vol.23, No.1, pp.29-41.
- Scherer, F.M. (1988) "Corporate Takeovers: The Efficiency Arguments," *Journal of Economic Perspectives*, Vol. 2, No.1, pp.69-82, Winter.

- Schmitz, H. (1995) "Collective Efficiency: Growth Path for Small-Scale Industry", *Journal of Development Studies*, Vol.31, No.4, pp.529-566.
- Thee, K.W. (1994) Indonesia, in S.D. Meyanathan (ed.) *Industrial Structures and the Development of Small and Medium Enterprise Linkages: Examples from East Asia*, World Bank, Washington, D.C.
- Weber, A. (1929) *Theory of the Location of Industries*, University of Chicago Press,



## CHAPTER 3

### SMEs and Production Networks – framework

**CHARLES HARVIE**

Centre for Small Business and Regional Research,  
School of Economics, Faculty of Commerce  
University of Wollongong, Australia

*This chapter develops and presents a framework for analysis of the core ingredients/characteristics required to enhance the capability of SMEs participating in regional production networks. The framework emphasises the importance of resource factors, psychological factors and external environment factors in impacting upon the barriers and capability of an SME, and that this determines the business strategy adopted by the SME. One of these involves the decision to participate in a production network. The framework provides the basis for the empirical analysis, hypotheses testing and profiling developed in subsequent chapters, aimed at highlighting the key characteristics of SMEs that participate in production networks and, in particular, the characteristics of those SMEs that participate in high quality parts of a production network.*

*The chapter is structured as follows. Section 2 presents an overview of the framework utilised in this study, highlighting factors and relationships that will facilitate subsequent quantitative analysis of the key characteristics of SMEs likely to participate in a production network, as well as those characteristics which appear to be important in participating in a high quality production network. Section 3 highlights key relationships from the framework as a focus for subsequent analysis. Section 4 presents a summary of the major conclusions from this chapter.*

## 1. Introduction

In this chapter we develop and present a framework for analysis of the core ingredients/characteristics required to enhance the capability of SMEs participating in regional production networks. This framework will provide the basis for the empirical analysis, hypotheses testing and profiling developed in subsequent chapters, aimed at highlighting the key characteristics of SMEs that participate in production networks and, in particular, the characteristics of those SMEs that participate in, what we describe here, high quality production networks. In doing so we bring together various strands in the literature relating to the SME decision to internationalize (of which participation in a production network is obviously one option).

The chapter is structured as follows. Section 2 presents an overview of the framework utilised in this study, highlighting factors and relationships that will facilitate subsequent quantitative analysis of the key characteristics of SMEs likely to participate in a production network, as well as those characteristics which appear to be important in participating in a high quality production network<sup>1</sup>. Section 3 highlights key relationships from the framework as a focus for subsequent analysis. Section 4 presents a summary of the major conclusions from this chapter.

## 2. Framework

### *2.1. Context, Approaches and Capabilities*

To fully participate in the process of globalisation and regional production networks, SMEs need to overcome barriers related to their size, and to develop capacities enabling them to become more intrinsically engaged and competitive in global markets. Their capacity constraints, or barriers, are multi-dimensional in nature and can be usefully highlighted and explored in the context of the **integrative model** summarized in Figure 1. This integrates **approaches** in the literature concerned with

---

<sup>1</sup> As defined in this study, high quality means participation in tier 1 and 2 type production networking while low quality involves participation in tier 3 and tier 4 type production networking.

identifying (1) SME resource barriers and capabilities, (2) psychological factors impacting upon SME perceptions and attitudes, including that towards, for example, risk, trust and receptivity to new ideas, (3) the importance of the entrepreneur in the determination of psychological factors, (4) the impact of the external economic environment on the SME. These factors interact to determine the business strategy of the SME. We adapt this framework with application to the case of SME participation in production networks.

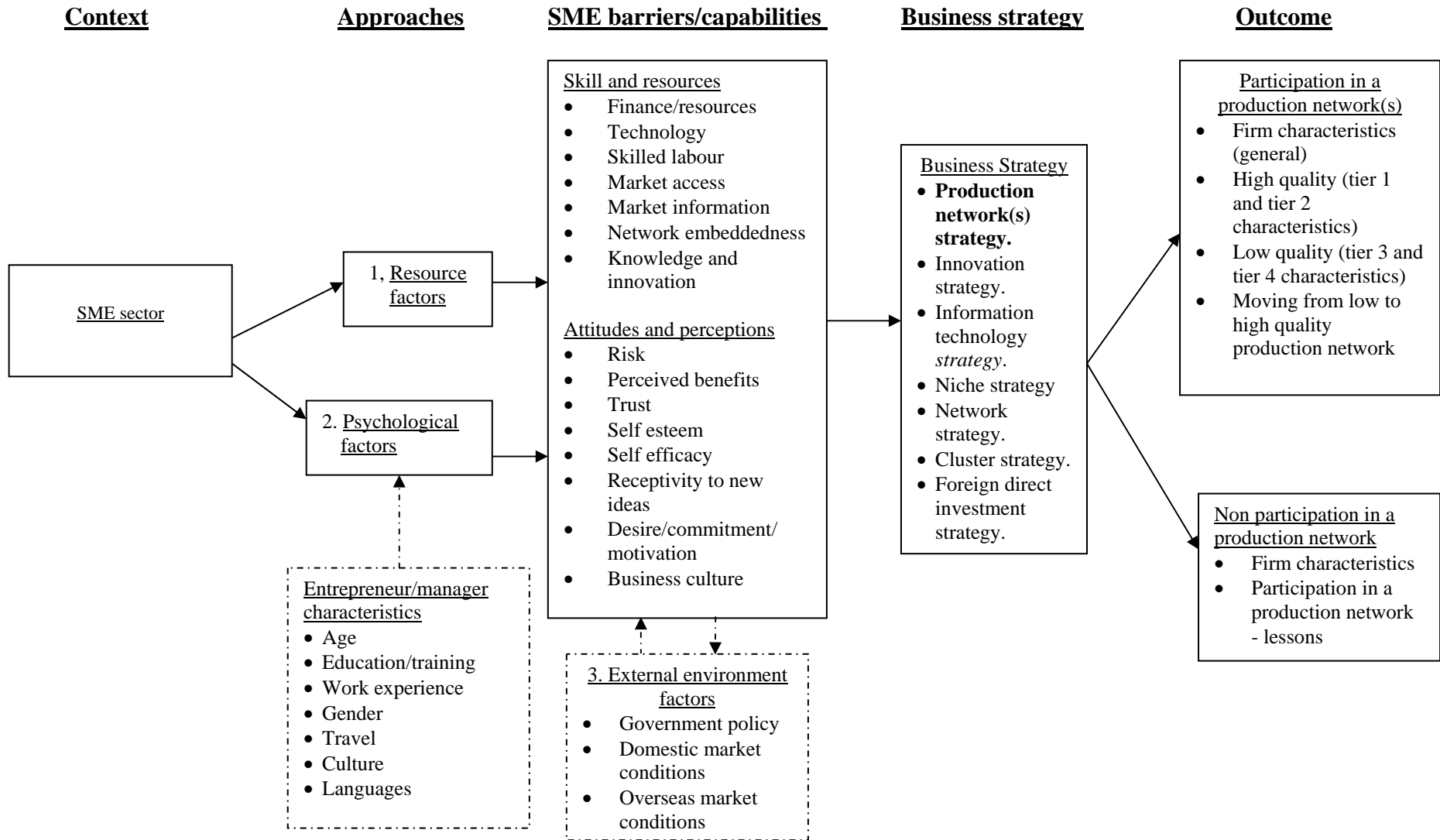
These factors can be usefully classified into the two broad headings of internal and external factors. **Internal factors** this can be further usefully broken down into two sub factors. The first of are directly relate directly to the small size and limited resources of SME. These **resource factors** relate to access to: finance, technology, skilled labour, markets, market information, network embeddedness and knowledge and innovation. The second internal factor relates to **psychological factors**, based on the characteristics of the entrepreneur, that determines the attitudes and perceptions of the SME towards risk, the benefits of participating in a production network, trust, self-esteem, self-efficacy, receptivity to new ideas, desire, commitment and motivation towards achieving outcomes from participation in a production networks etc. as well as the overall business culture of the SME. Resource and psychological factors combine to determine the business strategy adopted by the enterprise and ultimately the decision to participate, and to what degree, in a production network and the quality of that participation. In addition to these internal factors, we must also consider **external environment factors** (government policy, domestic market conditions and overseas market conditions). These are out-with the direct control of SMEs, but can also play an important role in ultimately influencing the business strategy adopted by the SME. Each of these factors is now explored in more detail.

## **Internal factors**

### *(1) Resource factors*

The Ottawa meeting of APEC in September 1997 emphasised five key internal resource factors for the capacity building of SMEs. These being access to: (1) markets; (2) technology; (3) human resources; (4) financing; and (5) information.

**Figure 1 SMEs and production networks – framework outline**



### ***1. Access to Markets.***

SMEs are recognized as facing special problems relating to their size and that, in the context of rapid trade liberalization, they need to develop capacities to take advantage of opportunities arising from a more open regional trading system and production network developments. The Internet is regarded as being of particular importance in this regard, as is the need to identify appropriate partners for joint ventures or strategic alliances, and for governments to harmonize standards and professional qualifications, including investment laws and taxation procedures, and to protect intellectual property rights. Despite cuts in average tariffs, small businesses still have difficulty in fully exploiting opportunities arising from globalization and regional trading agreements. The SME contribution to direct exports has remained static or declined. Reductions in tariffs have not benefited SMEs, and more emphasis by regional governments needs to be put on tackling non-tariff barriers (customs procedures, mobility of business people, standards of labelling requirements, access to finance, recognition of professional qualifications, consumer protection particularly regarding on line transactions, and intellectual property rights) if SMEs are to benefit from trade expansion and to enhance their exporting capacity. Greater participation by SMEs in trade is likely to generate a number of benefits. Other reasons include high transaction costs including that arising from accessing transport infrastructure and in the cost of transportation, achieving quality accreditation (such as ISO) making it impossible to access markets where ISO standards are obligatory, and in domestic markets they find it difficult to compete on equal terms with large firms relating to government tenders. With access to a larger market, individual firms will be able to benefit from economies of scale and generate additional revenue (APEC, 2002). In terms of efficiency, firms which expose themselves to more intense competition in global markets can acquire new skills, new technology and new marketing techniques. Exporters tend to apply knowledge and technologies at a faster rate and more innovatively than non-exporters. This can result in greater efficiency and productivity. A larger number of SME exporters assist skill and technology applications by spreading these over many small buyers and speeding up a multiplier effect, which extends the gains over the entire economy and not just firms that export. Ultimately, the economy will benefit from more flexible and environmentally responsive firms, higher growth

rates and long-term improvements in productivity and employment levels. Exporting, and participation in production networks, has a positive effect on living standards, as competition drives firms to invest in staff development, which in turn improves productivity, wages and working conditions. Exporting also encourages cultural diversity and the building of relationships and reputations with other countries.

SMEs also lack skills in dealing with customers both in the domestic and overseas markets. They have limited knowledge about language and culture as well as the legal and bureaucratic issues involved in participating in export markets and production networks. They may experience a lack of business infrastructure support and in some countries may be discriminated against relative to large firms.

## ***2. Access to Technology.***

In a knowledge-based economy, applications of information and communications technology can be a great leveller for SMEs. However, when SMEs have limited access to, or understanding of, these technologies, and their cost is prohibitive, prospects for acquiring and utilising them is reduced. In terms of the Internet, e-commerce use amongst small businesses is currently lagging behind their larger counterparts (OECD, 2000b). However, many small businesses view e-commerce as providing cost savings and growth potential and the gap relative to larger enterprises is closing, but further action by regional governments will be required (in terms of improved infrastructure, cost, and IT training, as well as information relating to business opportunities that e-commerce can generate). Enhancing the role and participation of small businesses in the global marketplace through e-commerce will be of critical importance. E-commerce presents small businesses with the opportunity to compensate for their traditional weakness in areas such as access to distant markets both domestic and overseas and competing with larger firms. It can provide global opportunities by enabling the flow of ideas across national boundaries, improving the flow of information and linking increased numbers of buyers and sellers. This provides opportunities for greater numbers of trading partners dealing in goods and increasingly in services. Studies suggest that small businesses with higher levels of e-commerce capabilities are more likely to identify using e-commerce to reach international markets as an important benefit. Hence the desire to export for many SMEs may have a fundamental influence

on promoting the rapid development of more advanced e-commerce capabilities. For many small businesses in the Asia-Pacific region, integrating the development of e-commerce into their future strategies for accessing both domestic and international markets is seen as being crucial. E-commerce also has the potential to lead to cost savings and efficiency gains. Raising the awareness as well as the understanding of the benefits to be obtained from e-commerce will be important in increasing its uptake by small business. To incorporate the technology into their operations small business needs to find ways to deal with high set-up costs, as well as lack of adequate infrastructure and IT skills. If these can be overcome small business will play an important part in the region's 'new economy' at least as much as it will for more traditional forms of commerce. In this regard the role of the government is likely to be crucial. This includes: development of the telecommunications infrastructure; addressing legal and liability concerns; ensuring that fair taxation practices are applied to e-commerce; addressing security issues; and raising the awareness of the business benefits of e-commerce, including the potential for export growth.

### ***3. Access to human resources.***

Human resource development for SMEs requires a comprehensive approach including: social structures and systems such as broad educational reforms; encouragement of entrepreneurship, business skills acquisition (management, accounting and marketing) and innovation in society; mechanisms for self learning and ongoing training and enhancement of human resources; and appropriate governmental support programs. Among small and micro enterprises a shortage of skills in information technology and cost are a major hindrance to business growth. Consequently, staff training in IT as well as in skills required to successfully enter export markets are required. Improved IT skills would enable: more efficient management of the business; workload sharing; and the development of more market opportunities including that of exports. Other desired skills include language and cultural expertise, as well as legal and logistical knowledge.

#### ***4. Access to financing.***

The opportunity to access small amounts of finance can be an important catalyst for small businesses to get access to the resources they need to gain a foothold in the market. This is particularly critical for micro-enterprises. Many SMEs lack awareness of financing resources and programs available from commercial banks and other private sector and government sources, and have difficulty defining and articulating their financing needs. Financial institutions, however, need to be more responsive to their needs.

#### ***5. Access to information.***

Accurate and timely information on, for example, market opportunities, financial assistance and access to technology is crucial for SMEs to compete and grow in a global market environment. This is an important role that both the government and relevant business organizations can play

In addition to these key areas for capacity building, there is also the need to encourage SME embeddedness in knowledge and business networks, including the development of strategic alliances and joint ventures, and enhancing the innovative capacity of SMEs.

#### ***6. Network embeddedness***

Entrepreneurs who develop and maintain ties with other entrepreneurs tend to outperform those who do not. A network is a group of firms using combined resources to cooperate on joint projects and can include knowledge bodies such as research institutions and universities. Business networks take different forms and serve different objectives. Some are structured and formal, even having their own legal personality. Others are informal, where, for instance, groups of firms share ideas or develop broad forms of cooperation. Some aim at general information sharing while others address more specific objectives (such as joint export ventures). Soft networks generally encompass a larger number of firms than hard networks, with membership often open to all that meet a minimum requirement (such as payment of an annual fee). Networks have come to encompass agreements with research bodies, education and training institutions and public authorities. Hard networks are more commercially focused,



involving a limited number of pre-selected firms, sometimes formally and tightly linked through a joint venture/strategic alliance. Networks can allow accelerated learning. Moreover, peer based learning – which networks permit – is the learning medium of choice for many small firms. Furthermore, to innovate, entrepreneurs often need to re-configure relations with suppliers, which networks can facilitate. Networks can allow the sharing of overhead costs and the exploitation of specific scale economies present in collective action. Networks need not be geographically concentrated. Once **trust** among participants is established, and the strategic direction agreed, operation dialogue could be facilitated through electronic means.

### ***7. Knowledge and Innovation.***

Recent studies have shown that despite the fact that a very small fraction of total business R&D in the developed economies is accounted for by SMEs, they contribute greatly to the innovation system by introducing new products and adapting existing products to the needs of their customers (OECD, 2000a). Small firms account for a disproportionate share of new product innovations despite their low R&D expenditures (Acs and Audretsch, 1990). In addition, they have also been innovative in terms of improved designs and product processes and in the adoption of new technologies. Investment in innovative activities is on the rise in SMEs and is increasing at a faster rate than that for large firms. Scherer (1988) has suggested that SMEs possess a number of advantages relative to large firms when it comes to innovative activity. First, they are less bureaucratic than highly structured organizations. Second, many advances in technology accumulate on a myriad of detailed inventions involving individual components, materials and fabrications techniques. The sales possibilities for making such narrow, detailed advances are often too small to interest large firms. Third, it is easier to sustain high interest in innovation in small organizations where the links between challenges, staff and potential rewards are tight. Firms in the developed high cost economies can no longer compete in labour intensive areas of production where they have lost their comparative advantage, but rather must shift into knowledge based economic activities where comparative advantage is compatible with both high wages and high levels of employment. This emerging comparative advantage is based on innovative activity. For the developed economies of East Asia their future international

competitiveness will also depend upon their ability to develop a capacity in knowledge intensive firms, many of which will be SMEs based upon the experience of the developed OECD economies.

## *(2) Psychological factors*

The empirical literature relating to the entrepreneur/managerial influence on exporting indicates that certain **managerial/entrepreneurial characteristics** are important. These include the decision maker's educational background, cultural background, language proficiency and experience abroad. Entrepreneur/managerial perceptions of risk, costs, and profits in overseas markets also have a strong association with exporting. However, general subjective managerial characteristics (including attitudes to risk, tolerance, innovativeness, flexibility, commitment, quality and dynamism) are rarely discussed in the literature. However, these very characteristics are consistently demonstrated as being strongly associated with the propensity to export (Leonidou, Katsikeas et al. 1998). Zou and Stan (1998) found that the most important sets of determinants of export performance are export marketing strategy and **management attitudes and perceptions**.

The performance and success of small firms have been increasingly examined from a psychological perspective (Frese, Brantjes et al. 2002; Krauss, Frese et al. 2005; and Rauch and Frese, 2007). Frese et al. (2002, p.260) argue that a psychological perspective is warranted for several reasons. First, the main actor in a small business is usually the founder and owner, who manage it daily. Second, strategy process characteristics have a direct effect on the actions required for success. Third, psychological issues need to be considered once a strategy process becomes important. The literature relating specifically to barriers to exporting by SMEs has identified several psychological barriers. These barriers include: perceptions concerning the costs, risks and profitability of exporting including an ethnocentric rather than geocentric orientation, short rather than long-term perspectives, the view that exporting is too risky, "not for us", "too much trouble", "someone else's problem" (Hamill and Gregory, 1997). Many of these perceptions are pertinent in the case of SME participation in a production network.

A recent study by Patterson (2004) of perceptions of Australian service firms' attitude toward exporting found that perceived barriers or hindrances, the perceptions of the benefits of exporting and managers' education are the construct group that differentiate exporters and non-exporters. Among these, **perceptions of the benefits of exporting** are the single most powerful variable discriminating the two groups. The study also found that firm capabilities and characteristics as well as competitive environment are not useful in discriminating exporters and non-exporters. Instead, managers' beliefs about the costs, benefits and perceived barriers are the most important in distinguishing between the two groups (Patterson, 2004, p.29). This study will also facilitate a robust analysis of some of these in the context of production network participation.

Figure 1 shows how entrepreneurial/managerial characteristics such as age, gender, education and training, work experience, business location, sector of operation, cultural background, ethnicity of the business owner, overseas travel/work experience, language skills, business skills and participation in networks can exert an important influence on business attitude and perception particularly towards such important factors as risk, trust, self esteem, self efficacy, receptivity to new ideas and overall business culture.

### *(3) External environment factors*

External environment barriers/factors are also likely to influence the SME business strategy to export or participate in a production network, and can be categorised as follows: government policies and related incentives to export or engage in a production network, and market (domestic and overseas) conditions and entry barriers to overseas markets (see Figure 1). Inclusion of the former facilitates identification of effective policies to encourage SME exporting and production network participation, while the latter can identify ongoing barriers facing SMEs wishing to access both domestic and overseas markets as well as participate in a production network. Identified barriers inhibiting access to overseas markets or production networks by SMEs can then be given high priority in future trade negotiations (such as for prospective free trade agreements involving ASEAN countries).

The three approaches – resource factors, psychological factors and external environment factors combine to determine the capacities, resources and attitude, and barriers facing the SME. These will determine the business strategy that the SME is likely and capable of pursuing. One of which being the pursuit or participation in a production network that can entail dealings as a supplier to other domestic small and large enterprises or as a supplier to a multinational enterprise.

## 2.2. *Business strategy*

In the new economy the ability of SMEs to create, access and commercialize knowledge on global markets has become an imperative source of competitiveness in global markets and for engagement in high value adding activities. Based on the experiences of developed country members of the OECD, some of the principle business strategies that have been used by innovative SMEs to be globally competitive have included the following (see OECD 2000a, p.11):

- *Innovation strategy*, in which SMEs try to appropriate returns from their knowledge base (which may or may not involve own investments in R&D).
- *Information technology strategy*, which makes innovative uses of information technology in order to reduce SME costs and increase productivity.
- *Niche strategy*, in which SMEs choose to become sophisticated global players in a narrow product line.
- *Network strategy*, in which SMEs work and co-operate with other firms, be they SMEs or large enterprises, in order to improve their ability to access and absorb innovations.
- *Cluster strategy*, in which SMEs locate in close proximity with competitors in order to take advantage of knowledge spill-overs, especially in the early stages of the industrial lifecycle (key strategy at the regional level).
- *Foreign direct investment strategy*, in which SMEs exploit firm specific ownership advantages overseas.
- *Production networks*, where SMEs attempt to take advantage of trans-national corporation outsourcing, arising from the fragmentation of production, by linking into the production networks of large companies (preferably at the high

value adding end). This can enable access to technology and new management skills, however it also requires SMEs to achieve the level of technology, quality and reliability of supply demanded by large companies.

From the perspective of this study it is the production network strategy that is of particular interest. It should be emphasised, however, that the above strategies are not necessarily mutually exclusive. In fact a number of them are likely to be complementary in nature with the overall business strategy encompassing some or all of the elements of each of these strategies. For example, the desire and ability to participate in production networks is likely to also require appropriating, and enhancing, the knowledge and innovative capacity of firm. It may also require the firm to more innovatively utilise information and communications technology, develop niche expertise in a narrow range of products and services. To gain the information and knowledge required to participate in a production network, as well as increase its absorptive capacity of new innovations and technology as required by the customer in the production network, greater embeddedness in a knowledge network may be fundamental, requiring more interaction with other SMEs, large enterprises and research and knowledge institutions. A cluster strategy, involving close proximity to the customer (just in time requirement) or close proximity to other SMEs at the same stage of production (horizontal cluster) or a different stage in the production process (vertical cluster), may also be a fundamental requirement for participation in a production network. It may also be necessary for the firm to consider foreign direct investment overseas to fully exploit firm specific advantages and to maintain its competitiveness in the production network. This was a requirement for many Japanese SMEs after large Japanese MNCs moved their activities increasingly offshore.

This study will focus upon identification of the key characteristics of SMEs (resources and psychology) that participate in a production network.

### *2.3. Outcomes – quality and depth of network production participation*

Participation in a production network may be the primary goal of an SME's business strategy, but only some will be successful while for many it will simply not be

unattainable<sup>2</sup>. For many SMEs it may not be seen as an important part of their business strategy. It is, however, of contemporary importance for many firms and governments in the region (East Asia) to identify the characteristics or ingredients that are most likely to result in successful production network participation. The holistic framework presented in Figure 1 is useful in helping to highlight some of the key characteristics that need to be focused upon. These are likely to include – access to key resources, the psychology or business culture of the firm, attitude to risk, trust, self esteem, perceived benefits of such participation and so on, as well as the external environment (government policies, domestic market stability and conditions as well as external market stability and conditions) upon which firms can exert little to no influence. In addition, it is also important to compare and contrast the characteristics of successful network participations with that of non participants, to identify what the latter need to do in order to achieve network participation. Answers to these questions will be provided in the following chapter, where an empirical analysis of data obtained from a survey questionnaire will be conducted.

While the issue of identifying the characteristics of successful participation in a production network is an important one, requiring robust evidence-based analysis, of equal importance is the quality, nature, depth and value adding contribution of this participation. It is also important, therefore, to analyse in more detail the characteristics of those SMEs participating in higher quality, higher value adding activities, as defined in this study.

### **3. Identification of Key Issues from the Framework**

From the previous discussion it is now possible to identify a number of key issues that require investigation and verification by means of a quantitative analysis. This quantitative analysis, to be conducted in the following chapter, will be based on data obtained by means of a survey questionnaire conducted in nine countries in East Asia,

---

<sup>2</sup> The requirements for participation are likely to involve issues such as price competitiveness, quality of product, ability to produce desired quantity of the product and ability to delivery by specified times.

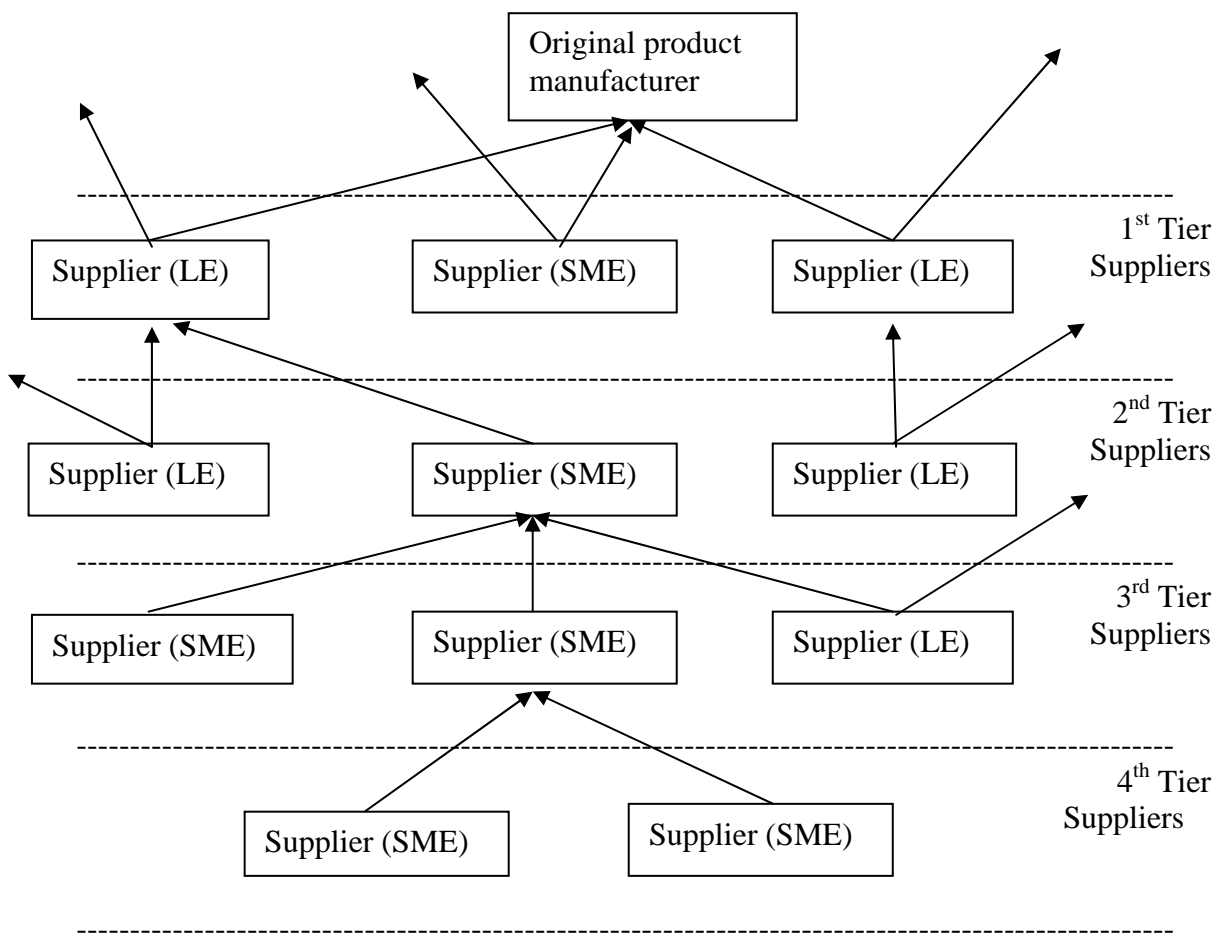
consisting of SMEs currently participating in a network and SMEs that are not. The major issues to be analysed are as follows:

1. are there any statistically significant differences in the characteristics of the cohort of firms in the sample that are participating in a production network from those that are not participating (e.g. age, size, ownership, productivity, sales, debt and skill intensity)?
2. are there statistically significant differences in the business capability characteristics for those firm that are and are not participating in a production network?
3. are there statistically significant differences in the entrepreneurial characteristics between those firms that are and are not participating in a production network?
4. what firm characteristics are statistically significant determinants of participation in a production network for those SMEs already participating in a production network?
5. what are the major business constraints to the growth of all the firms in the survey, those in production networks and those not in production networks, and are there significant differences between them?

An important issue given further emphasis in this study, beyond entry to a production network, is the quality upgrading of production network participation. SME participation can be at a variety of levels or tiers in the production process (see Figure 2). Higher level tiers (tier 1 and tier 2) are likely to involve greater skill, technology, knowledge, innovative and value adding and creation activity, as well as pricing power and brand presence (Abonyi, 2005). Production network participation at lower tiers (say tier 3 and tier 4 and below) can be reasonably anticipated to involve lower skill, technology, knowledge, innovative and value adding activity, and the need to compete on cost. In the case of the latter this could involve simple assembly activity requiring unskilled labour and standardised low level technology. Consequently, it is an important issue to consider. For many developing economies, whose SMEs are involved in low value adding activities, there are many problems. Activities in tier 3 and 4 parts of production networks may be easier to enter but they may lock the country into low technology, basic assembly, low skill and value adding activities, and involve intensive competition from other low cost labour intensive developing economies.

Placement at such a point in the production process makes them easier to replace due to relatively easy switching by customers to other sources of supply. It is likely to involve intense competition on the basis of price and labour cost and constrain overall economic development. However, it does represent a starting point, and can be viewed as an opportunity to move up the production network value chain, by increasing the value content of activities and strengthening pricing power (Abonyi, 2005). A primary objective, therefore, is to move up the value adding, skill and knowledge intensive spectrum, and to upgrade to higher tier activities in a production network.

**Figure 2. Global and Regional Production Networks and SMEs**



LE – Large enterprise  
 SME – small or medium sized enterprise

Source: Abonyi, (2005).

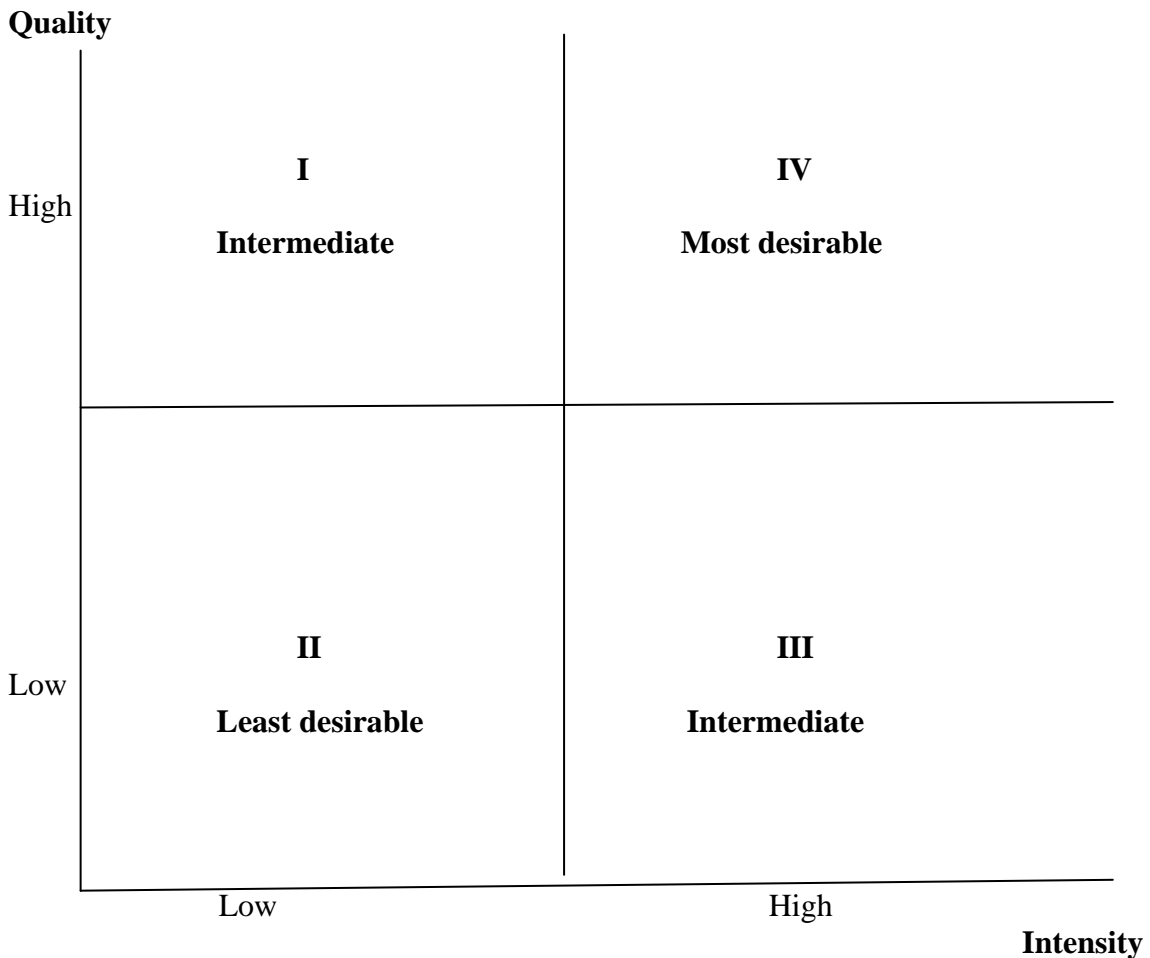


These issues can be put into perspective with the aid of the four quadrant diagram contained in Figure 3. This shows the quality-intensity nexus of production networks, and each of the four quadrants can be described as follows. In Quadrant 1, firms (SMEs) have low intensity but high quality production network participation (tier 1 and 2). The low intensity of participation may be by choice and is not necessarily a bad outcome. However, it could also be indicative that while value adding activity is high there could be capacity issues in expanding the participation of firms in such activities, which could result in a hindrance to firm and overall economy growth. This position is described here as an **intermediate position**, and suggests that policies aimed at identifying why firm intensity is low is conducive to further exploration. Further analysis of the characteristics of firms in this quadrant may shed light as to why intensity is low, and what remedial action may be required.

Quadrant II contains firms (SMEs) that are characterised as having low intensity and low quality production network participation. We can describe this as being the **least desirable quadrant** for a firm, already participating in a production network, to be located. It would suggest that the firm is involved in low value adding, knowledge and skill intensive activities which are the subject of intense competition from other low income, unskilled developing economies at a similar stage of development. Intensive competition, low quality, low skilled, low technology activity at this level could be the reason constraining this firm, or aggregate of firms, from further expansion of activity in production networks.

Quadrant III contains a cohort of firms that have high intensity but low quality production network involvement. As with firms in quadrant 1 they are in an **intermediate position**. Such firms are likely to be involved in low value adding, low skill, low technology activities. They generate their high intensity production network involvement in low tier activities and likely to do so on the basis of price competitiveness from low wages. Strategically, this again is likely to be a weak position for a firm to be in, or developing country should most of its firm production network activity be similarly characterised. Firms in this quadrant are also likely to be exposed to intense competition from other country firms in a similar situation, requiring costs (wages) to be kept low in order to maintain competitiveness.

**Figure 3. Quality-Intensity Nexus in Production Networks**



*Notes:*

Quadrant I – Low intensity-high quality production network participation (tier 1 and 2)

Quadrant II – Low intensity-low quality production network participation (tier 3 and 4)

Quadrant III – High intensity-low quality production network participation (tier 3 and 4)

Quadrant IV – High intensity-high quality production network participation (tier 1 and 2)

*Source:* Authors.

Finally, firms in Quadrant IV are in the **most enviable and desirable position**. They are characterised by high intensity high quality production network activity. Firms in this quadrant are likely to be involved in high value adding, advanced technology, innovative, knowledge and skill intensive areas of activity, which enables them to participate in tier 1 and tier 2 production network activities. Their competitive advantage is likely to be based on their innovative activities and ability to generate economic rent from their unique knowledge and skill base. Such firms are likely to

compete on the basis of quality and innovation and not solely on the basis of price. They are likely to be in a strong position to compete with rivals because of the innate or unique knowledge and skills possessed by the firm. Such firms can provide a solid foundation for economic growth and development in the 'new' economy.

While Figure 3 provides a useful means by which to categorise our cohort of SMEs that are used in the survey questionnaire conducted in this survey, it also provides a useful means by which we can address the issue of identifying strategies, at the individual firm or aggregate (government policy) levels, aimed at moving firms located near the origin in Figure 3 (in the last desirable Quadrant I) further from the origin (to the most desirable Quadrant IV). By identifying the statistically significant characteristics of enterprises in each of these quadrants, particularly those in Quadrant IV which we can regard as being the benchmark case, we can then compare these with firms in Quadrant IV. This process can also assist in identifying differences in the capacities and barriers facing enterprises in each of the four quadrants, and provide a focus for firm and government policies. One issue that we need to consider is that while the longer term objective is to move firms into Quadrant IV, this may not be feasible in the short or medium runs. Hence, for example, firms in Quadrant II may need to consider moving to Quadrant I in the short to medium run, attaining the characteristics and capacities of firms in this quadrant, before tackling the characteristics and capacities attained by firms in Quadrant IV. On the other hand firms in Quadrant II may move to Quadrant III and then IV, requiring a different short to medium term strategy. Hence Figure 3 has the potential to provide an interesting framework in which to consider short and medium term goals for firms in terms of their characteristics and capacities and constraints, if longer term objectives are to be obtained.

In the context of this study focus will be given in the next chapter to identifying how firms can move from low to high quality production network involvement. The reason for this being that we have insufficient data on the intensity of participation by firms in high and low intensity production networks<sup>3</sup>. Hence, we focus upon the characteristics of firms in high quality production network (Quadrant I and Quadrant IV) and compare these with firms in low quality production networks (Quadrants II and

---

<sup>3</sup> The survey questionnaire was only concerned with identifying if the firm was already in a network but did not attempt to quantify the extent of network involvement.

III). By doing so we are able to compare the characteristics, capabilities and barriers facing firms (SMEs) in Quadrants I and IV with those in Quadrants II and III with the objective of identifying statistically significant different characteristics, capabilities, and barriers that may need to be replicated by firms in Quadrants II and III if they are to achieve high quality production network involvement.

#### **4. Summary and Conclusions**

This chapter presented a framework to facilitate the empirical analysis conducted in the following chapter. Emphasis was given to the contribution of resources, psychological and external environmental factors impacting upon the capabilities and barriers facing SMEs. These capabilities and barriers are seen as being instrumental in the determination of the business strategy of the SME. A number of possible strategies that could be pursued by the SME to maintain competitiveness in the global economy were highlighted with particular emphasis given to participation in global and regional production networks or value chains. This was further elaborated upon to discuss the issue of not only network participation but also upgrading to participation in a high quality production network. Indeed, participation in production networks is best seen as being two-dimensional, consisting of the quality of the contribution to the production network (dependent on the extent of the knowledge, skill, innovation and value adding activities involved) as well as the intensity of participation in production networks.

The aim of the chapter has been to identify: potential characteristics of SMEs participating and not participating in production networks; potential differences in the business capability characteristics of those firm that are and are not participating in production networks; potential differences in the entrepreneurial characteristics of those firms that are and are not participating in a production network; the potentially most important factors determining participation in a production network for those SMEs already participating in a production network; potential determinants of participation in a high quality production network from that of a low quality production network; and the major potential business constraints to the growth of all the firms whether they

participate in a production network or not. In the following chapter we utilize survey based data obtained from SMEs in nine East Asian economies to elicit statistically significant evidence based answers to each of these issues. That is, we conduct an empirical analysis to identify: statistically significant differences in the characteristics of firms that engage and do not engage in production networks; statistically significant differences in their capacities as well as entrepreneurial characteristics; statistically significant determinants of SME participation in production networks as well as differences in the constraints faced by participating and non participating production network SMEs. In addition, statistical evidence will be provided as to the key constraints facing SMEs in low quality production network with those participating in high quality production networks. A statistical comparison of the importance of various forms of assistance required by firms in either of these categories is also presented.

## References

- Abonyi, G. (2005) "Transformation of Global Production, Trade and Investment: Global Value Chains and International Production Networks." paper presented to the Expert Group Meeting on SMEs' Participation in Global and Regional Supply Chains, UNESCAP, Bangkok, November.
- Abonyi, G. (2006) "A Consequence of Globalization: Emergence of Global Value Chains and International Business Network." paper presented to the Expert Group Meeting on Promoting SMEs' Participation in Global Value Chains in the Greater Mekong Subregion, Kunming, China, March.
- Acs, Z.J. and Audretsch, D.B. (1990) *Innovation and Small Firms*, The MIT Press, Cambridge, Massachusetts.
- APEC (2002) Expanding the Benefits of Cooperation for SMEs, Joint Ministerial Statement, 9<sup>th</sup> APEC Small and Medium Enterprise Ministerial meeting, Acapulco, Mexico, August.
- Frese, M., A. Brantjes, et al. (2002) "Psychological Success Factors of Small Scale Businesses in Namibia: The Roles of Strategy Process, Entrepreneurial Orientation and the Environment." *Journal of Developmental Entrepreneurship* 7(3), pp.259-282.
- Hamill, J. and K. Gregory (1997) "Internet Marketing in the Internationalisation of UK SMEs." *Journal of Marketing Management*, 13(1-3), pp.9-28.
- Krauss, S. I., M. Frese, et al. (2005) "Entrepreneurial orientation: A psychological model of success among southern African small business owners." *European Journal of Work and Organizational Psychology* 14, no.3, 315 - 344.
- Leonidou, L. C., C. S. Katsikeas, et al. (1998) "Identifying Managerial Influences on Exporting: Past Research and Future Directions." *Journal of International Marketing* 6(2), pp. 74–102.
- OECD (2000a), Enhancing the Competitiveness of SMEs through Innovation, Workshop paper No. 1, Bologna Meeting, OECD, Paris.
- OECD (2000b) "Realizing the Potential of Electronic Commerce for SMEs in the Global Market." Workshop paper No. 3, Bologna Meeting, OECD, Paris.
- Patterson, P. G. (2004) "A Study of Perceptions Regarding Service Firms' Attitudes Towards Exporting." *Australasian Marketing Journal*, 12(2), pp.19-38.
- Rauch, A. and M. Frese (2007) "Let's Put the Person Back into Entrepreneurship Research: A Meta-analysis on the Relationship between Business Owners' Personality Traits, Business Creation, and Success." *European Journal of Work and Organizational Psychology* 16, no.4, pp.353 - 385.
- Scherer, F.M. (1988) "Corporate Takeovers: The Efficiency Arguments", *Journal of Economic Perspectives*, Vol. 2, No.1, pp.69-82, Winter.

Zou, S. and Stan, SW. (1998) "The Determinants of Export Performance: a Review of the Empirical Literature between 1987 and 1997." *International Marketing Review*, 15(5), pp.333-356.

## CHAPTER 4

# Constraints to Growth and Firm Characteristics Determinants of SME Participation in Production Networks

**CHARLES HARVIE**

Centre for Small Business and Regional Research,  
School of Economics, Faculty of Commerce  
University of Wollongong, Australia

**DIONISIUS NARJOKO**

Economic Research Institute for ASEAN and East Asia (ERIA)  
Jakarta, Indonesia

**SOTHEA OUM**

Economic Research Institute for ASEAN and East Asia (ERIA)  
Jakarta, Indonesia

*This chapter provides empirical analyses of SME participation and performance in production networks. It gauges the constraints of SME growth and firm characteristics determinants, building on the framework discussed in previous chapters and based on the ERIA Survey on SME Participation in Production Networks.*

*The results of perception survey indicate differences in the constraints facing SMEs that operate in production networks, compared to those that do not operate in the networks. SMEs in production networks consider distribution-logistics and business environment barriers more importantly than those out of the networks do. The descriptive and econometric results suggest that productivity, foreign ownership, financial characteristics, innovation efforts, and managerial/entrepreneurial attitude are the important firm characteristics that determine SME participation in production networks.*

*This chapter extends the analyses by considering the issue of SMEs and moving up to higher quality tiers in production networks. For those that are in lower quality of production network, internal constraints are critical to them in contrast to external constraints faced by those that are in higher quality of production network. Meanwhile, the econometric analysis reveals similar characteristic determinants as those SME that participate in production network, the difference is that, now size becomes an important determinant while effort to innovate and managerial attitude become less important determinants.*



## **1. Introduction**

This chapter provides empirical investigation on the participation of SME in production networks. It attempts to reveal the constraints to growth and firm characteristics determinants of SME participation in production networks. The chapter builds on the background and analytical framework presented in the previous chapter in its approaches to the investigation and analysis.

The empirical investigation relies on the results of the *ERIA Survey on SME Participation in Production Networks*, which was conducted over the period two to three months period at the end 2009 in most of ASEAN countries and China. The ASEAN countries covered are Thailand, Indonesia, Malaysia, Philippines, Vietnam, Cambodia, and Laos PDR.

The rest of this chapter is organized as follows. Section 2 explains the survey conducted for this study. Section 3 presents the survey results and empirical investigation on the constraints to grow. Section 4 to 6, meanwhile, addresses the empirical analysis on the determinants of SME participations. Section 4 in particular presents the hypotheses for the determinants and Section 5 describes the adopted methodology for the empirical analysis. Section 6 presents the empirical results and analysis of the determinants of SME participation in production networks. Extending the previous section, Section 7 discusses key characteristics of SMEs participation in higher quality tiers of production networks. Finally, section 8 summarizes and concludes the empirical investigation.

## **2. The Questionnaire and Sample**

Empirical works documented in this report are based on results of questionnaire survey conducted during two to three months at the end of 2009. The questionnaire aims at collecting information on SME characteristics and perception of manager on the factors that constraints SME growth.

The questionnaire survey is presented in Appendix 1. It is divided to two parts, each of which addresses each of the survey's objectives. The first part tries to collect

information of the characteristics of the SME. This form the first part of the questionnaire, and it focuses on collecting information on the following characteristics: basic characteristics (i.e., size, age), ownership, cost and input structure, performance (i.e., sales, sales growth, profit rate, etc.), location in terms of distance to ports or industrial parks/economic processing zones (EPZs), source of finance, and capability to innovate. Meanwhile, the second part addresses the manager's perception on barriers to growth.

The second part follows OECD (2008) that all SMEs in the sample are asked to assess the importance of 44 barriers using a five-point Likert scale (“(1) very significant” to “(5) not significant”) and they were also asked to rank their constraints by 8 main categories, ranging from “very important” (1) to “less important” (8). Moreover, the SMEs were asked whether they have received any assistance from governments or non-governmental organizations (NGOs) and rate the effectiveness of those assistances which comprise of 7 main components using the same five-point Likert scale. Finally, they were asked to rate the importance of the assistances they wish to receive.

In total, there were 912 SMEs completed questionnaires. Table 1 shows a summary of the surveyed SMEs. In this survey, the firms with more than 200 workers are dropped from the sample, and there are about 780 SMEs remaining as presented in Table 1. In the sample, SMEs with staff numbers from 6 to 49 accounts for 52% of the total SMEs, followed by 18.3%, 18%, and 11.3% for those with staffs from 100 – 199, 50 – 99, and 1 – 5, respectively. The average ages of the SMEs are more than 10 years. Most SMEs in the sample are domestically owned, accounting for more than 70% of the total share in the companies.

For both 2007 and 2008, most SMEs reported growth in sales and a profit rate. Raw materials/intermediate input is the biggest part of the sampled firms' cost, on average accounting for more than 50% of total cost, followed by labor cost, utilities, and other costs, averaging about 20%, 12%, and 10%, respectively. An interest payment accounts for less 5% of total cost.

In terms of the education level of the employees, the majority of the workers have some vocational training as well as high school or lesser education. The surveyed SMEs reported that internal financing is the main source of their financing. The

majority of their working capital finance comes from retained earnings and other sources. Average borrowing cost is less than 10%. Though most SMEs sell large proportion of their products domestically, larger SMEs tend to engage more in exporting markets.

**Table 1. Characteristics of the Surveyed SMEs**

Characteristics	1 – 5 Persons			6 – 49 Persons			50 – 99 Persons			100 – 199 Persons		
	N	Mean	S.D	N	Mean	S.D	N	Mean	S.D	N	Mean	S.D
Age (year)	87	13.6	10.5	384	11.3	9.9	128	13.8	11.0	126	15.6	10.4
Ownership (%)												
Domestic	89	96.0	18.9	413	93.3	23.1	141	83.8	34.5	144	74.2	40.4
Foreign	89	4.0	18.9	413	6.2	22.6	141	14.5	33.5	144	22.4	39.6
Sale growth (%)												
2007	80	13.5	52.7	364	16.7	26.1	116	18.3	61.4	125	45.2	281.5
2008	81	6.4	23.4	365	32.5	206.6	117	28.6	100.9	127	16.1	29.2
Profit (%)												
2007	83	18.3	11.0	382	13.9	14.2	123	8.3	17.5	129	7.1	16.4
2008	84	18.5	15.2	398	11.7	27.3	135	6.2	27.2	141	8.8	17.9
Cost Structure 2008 (%)												
Labor	84	19.0	13.6	384	21.2	15.1	113	21.5	16.9	120	20.7	13.3
Raw Materials	84	48.0	17.6	392	53.2	19.8	129	58.4	21.7	137	57.7	20.6
Utilities	85	12.9	11.5	387	12.5	12.8	118	13.4	17.2	122	12.0	15.9
Interest	56	3.6	6.2	237	3.7	5.9	78	3.7	5.0	102	4.4	6.3
Other costs	76	9.4	8.7	348	10.8	10.8	99	12.0	15.8	106	12.0	15.4
Employees by Education (%)												
Tertiary	89	6.6	20.2	413	15.6	24.1	141	28.0	25.9	144	24.3	25.4
Vocational	89	14.5	30.5	413	23.8	29.5	141	18.9	18.6	144	21.3	21.7
High school or less	89	76.9	38.2	413	59.6	37.2	141	50.7	34.2	144	52.3	34.4
Source of Working Capital (%)												
Retained Earning	89	72.7	36.2	413	59.8	38.0	141	53.3	42.3	144	48.5	38.3
Bank	89	8.4	18.4	413	10.2	21.2	141	12.8	23.3	144	18.3	26.3
Other Financial Institutions	89	0.6	3.4	413	1.4	8.0	141	1.6	7.9	144	2.7	9.5
Others	89	18.4	33.2	413	25.6	34.0	141	24.4	36.5	144	27.1	37.9
Average Cost of Borrowing (%)	54	5.4	9.0	192	8.6	9.0	76	7.7	4.4	87	8.2	4.7
Sale Destination (%)												
Domestic	88	96.9	16.5	382	93.1	22.3	114	75.9	32.3	117	60.2	39.7
Export	2	90.0	14.1	49	56.2	36.2	55	54.3	29.7	82	60.5	34.9

Source: ERIA – SMEs Survey 2009.

### **3. Constraints to Growth**

This section presents an analysis on constraints faced by SMEs to grow. The analysis utilizes the information drawn from the perception part of the questionnaire.

#### **3.1. Constraints Faced by the Surveyed SMEs**

Table 2 presents the top 10 out of 44 barriers as seen by the surveyed SMEs are ranked using the average response rate (mean) and the complete results for all barriers are given in the appendix.

For the ranking of top 10 constraints for the whole sample, the first ranked constraint, “Offering competitive prices to customers” and seventh, “Difficulty in matching competitors' prices”, belong to the “Product and Price Barriers” which also rank first in Table 2. The second ranked constraint, “shortage of working capital to finance new business plan” and fourth “Lack of production capacity to expand”, all reflect “Functional Barriers” that are ranked second on the main constraint categories in Table 3. It is followed by “Poor/deteriorating economic conditions (home)” which reflects the “Business Environment Barrier”. Ranked fifth, sixth, and eighth highlights the “Information Barriers” category. Lastly, ranked tenth “Establishing and maintaining trust with business partners” is in the “Distribution, logistics, and Promotion Barriers”.

For SMEs in the production network, the ranking of top 10 constraints is quite similar to the whole sample, retaining 7 out of the top ten ranked constraints as in the whole sample. Among the 3 different constraints in the top 10 from the whole sample are: “Perceived risks in your current and new business operations” rank second, “High tax and tariff barriers (home)” rank sixth, and “Political instability (home)” which ranks seventh.

**Table 2. Ranked Top-Ten Constraints Faced by the Surveyed SMEs and by Status in Production Network**

Rank	Whole Sample	Production Network	
		IN	OUT
1	B14. Offering competitive prices to customers	B14. Offering competitive prices to customers	B7. Shortage of working capital to finance new business plan
2	B7. Shortage of working capital to finance new business plan	B35. Perceived risks in your current and new business operations	B14. Offering competitive prices to customers
3	B28. Poor/deteriorating economic conditions (home)	B28. Poor/deteriorating economic conditions (home)	B6. Lack of production capacity to expand
4	B6. Lack of production capacity to expand	B19. Establishing and maintaining trust with business partners	B2. Unreliable market data (costs, prices, market shares)
5	B1. Limited Information to locate/analyze markets/business partners	B1. Limited Information to locate/analyze markets/business partners	B1. Limited Information to locate/analyze markets/business partners
6	B2. Unreliable market data (costs, prices, market shares)	B31. High tax and tariff barriers (home)	B28. Poor/deteriorating economic conditions (home)
7	B15. Difficulty in matching competitors' prices	B30. Political instability (home)	B15. Difficulty in matching competitors' prices
8	B3. Inability to indentify and contact potential business partners	B15. Difficulty in matching competitors' prices	B3. Inability to indentify and contact potential business partners
9	B19. Establishing and maintaining trust with business partners	B6. Lack of production capacity to expand	B8. Difficulty in getting credit from suppliers and financial institutions
10	B4. Lack of managerial time to identify new business opportunities	B2. Unreliable market data (costs, prices, market shares)	B5. Insufficient quantity of and/or untrained personnel for market expansion

*Source:* ERIA – SMEs Survey 2009

The ranking for those SMEs out of the production network retains 9 out of top-ten constraints as in the whole sample ranking with only differences in order of the ranking.

The difference is “insufficient quantity of and/or untrained personnel for market” ranked tenth.

Table 3 shows the ranking of main category of constraints by the surveyed SMEs. The ranking is the same for the whole sample and those SMEs that are not in the production network. However, while the “Product and Price Barriers”, “Functional Barriers”, and “Business Environment Barrier” rank first, second, third top for the three groups, the “Informational barriers” rank lowest for SMEs that are in the production network compared with for the whole sample and those SMEs that are not in the production network.

**Table 3. Ranked Constraints by Category Faced by the Surveyed SMEs**

Rank	All sample	Production Network	
		IN	OUT
1	Product and price barriers	Product and price barriers	Product and price barriers
2	Functional barriers	Functional barriers	Functional barriers
3	Business environment barriers	Business environment barriers	Business environment barriers
4	Informational barriers	Distribution, logistics and promotion barriers	Informational barriers
5	Distribution, logistics and promotion barriers	Procedural barriers	Distribution, logistics and promotion barriers
6	Procedural barriers	Tax, tariff and non-tariff barriers	Procedural barriers
7	Tax, tariff and non-tariff barriers	Informational barriers	Tax, tariff and non-tariff barriers
8	Other barriers	Other barriers	Other barriers

Source: ERIA – SMEs Survey (2009).

In summary, results from the survey on constraints faced by SMEs reaffirm that most surveyed SMEs are operating under severe constraints internal to them. For all SMEs in the survey, both the detailed and main category ranking of constraints is consistently high on “Functional Barriers” and “Product and Price Barriers”. However,

the “Informational barriers” seems to be lower for SMEs that are in the production network compared with for the whole sample and those SMEs that are not in the production network.

### 3.2. Ranked Effectiveness and Perceptions of Needs-Assistance

The SMEs were also asked whether they have received any assistance from government or non-governmental organization (NGOs) and rate the effectiveness of those assistances which comprise of 7 main components. Table 4 shows the effectiveness and needs of assistances for all the surveyed SMEs. On average, between 32 to 48 % of SMEs have reported received assistances.

**Table 4. Ranked Effectiveness and Perception of Needs-Assistance to the Surveyed SMEs by Degree of Importance – All Sample**

Rank	Effectiveness of Assistance	% of Assisted SMEs	Perception of Needs- Assistance
1	Financing	31.5	Financing
2	Technology development and transfer	33.3	Information
3	Counseling and advice	35.8	Business linkages and networking
4	Overall improvement in investment climate	37.2	Overall improvement in investment climate
5	Business linkages and networking	40.2	Training
6	Training	41.1	Technology development and transfer
7	Information	47.7	Counseling and advice

Source: ERIA – SMEs Survey (2009).

As for the effectiveness of the assistance, “Financing”, and “Technology development and transfer” rank first and second, and followed by “Counseling and advice”, “Overall improvement in investment climate”, “Counseling and advice”, “Business linkages and networking”, “Training”, and last “Information”.

It should be logical that the assistances that are ranked top on their effectiveness should be rank lower in terms of needs-assistances for the SMEs. This is the case for “Information” which is given high priority. However, “Financing” is still the top priority of assistances needed by the SMEs. This could suggest that “Financing” is the overriding factor to facilitate further SMEs development.

When distinguishing between those that are in production network and those that are not, Table 5 shows that both groups reported to have similar proportion of assistance from NGOs or government. For those that are in production network, effective supports are in “Technology development and transfer”, “Financing”, “Counseling and advice”, “Overall improvement in investment climate”. “Business linkages and networking” and “Information” are the least effective supports they received. For those SMEs that are not in the production network, the rankings are quite similar, except that “Financing” ranks top, and “Business linkages and networking” is ranked a bit higher than those that are in production network.

As far as the perception of needs-assistances are concerned, “Overall improvement in investment climate”, “Financing”, and “Business linkages and networking” are the top priority for those SMEs that are in the production network. For those SMEs that are not in the production network, “Financing”, “Information”, followed by “Training” are their most wanted supports. Again, “Financing” is still the top priority of assistances needed by both groups underlying the fundamental constraints faced and necessity of supports needed by all SMEs.

In summary, less than half of SMEs in the surveyed sample have received assistances from NOGs or government. Even though most of SMEs are satisfied with the assistances in “Financing”, it still appears to be the most important area of supports underlying the fundamental constraints faced and relevant of supports needed by all SMEs. On top of that for SMEs in general and those that are not in the production network, supports in “Information”, “Business linkages and networking”, and “Training” are their most wanted supports. However, for SMEs that are in the production network, “Overall improvement in investment climate”, “Financing”, and “Business linkages and networking” are the top three supports they need.



**Table 5. Ranked Effectiveness and Perception of Needs-Assistance to the Surveyed SMEs by Degree of Importance and their**

Rank	In Production Network			Out Production Network		
	Effectiveness of Assistance		Perception of Needs-Assistance	Effectiveness of Assistance		Perception of Needs-Assistance
	Rank (mean)	% of Assisted SMEs		Rank	% of Assisted SMEs	
1	Technology development and transfer	30.2	Overall improvement in investment climate	Financing	31.8	Financing
2	Financing	31.0	Financing	Technology development and transfer	34.7	Information
3	Counseling and advice	35.9	Business linkages and networking	Counseling and advice	35.8	Training
4	Overall improvement in investment climate	36.7	Information	Overall improvement in investment climate	37.4	Business linkages and networking
5	Training	40.7	Training	Business linkages and networking	38.8	Technology development and transfer
6	Business linkages and networking	43.1	Technology development and transfer	Training	41.2	Overall improvement in investment climate
7	Information	48.4	Counseling and advice	Information	47.4	Counseling and advice

#### **4. Hypotheses for Firm Characteristic Determinants of SME Participation in Production Networks**

The previous section identifies the constraints of SME growth, either for all SMEs or when the SMEs are grouped into two groups according to their status in production networks. The analysis presented in the previous section is continued by another analysis on the firm characteristic determinants of SME participation in production networks. These analyses are different, yet they are related. One may view the characteristics determinants as ‘internal’ constraints to grow for firms that intend to participate in production networks. Indeed, the previous analysis points to the impression that SMEs operate under a rather severe internal constraints. All in all, the two analyses looking both from the perception and empirical results are useful for analyzing SME participation and performance in production networks, and hence, having these in our study is well justified.

Emphasizing the role of firm characteristics has become an increasingly important consideration in the empirical studies examining performance of firms. Geroski (1998) observes that size seems to be an important characteristic associated with systematic differences in firm performance. Based on this observation, he further argues that understanding and identifying the source of firm heterogeneities is a key to making some progress in explaining heterogeneity in their performance.

Justification for this approach can also be derived from the resource-based theory of firms. According to this theory, the differences observed in firms’ performance can be explained by some specific factors attached to the firms (e.g. Rumel 1984; Barney 1992). There is no clear definition, however, about which resources constitute the firm-specific resources. Nevertheless, Barney (1992) argues, these resources can be defined to include all assets, capabilities, organisational processes, firm attributes, information, knowledge, etc that are controlled by firms. Dierickx and Cool (1989) argue that the most important element of these resources is that they are not available in the market but must be developed by firms.

If firm heterogeneity matters in determining participation and performance of SMEs in production networks, the question is, what are the characteristics of firms that

represent the sources of this heterogeneity? Drawing from the discussion in the previous chapter, as well as from that in the general economic literature, the following lists the characteristics considered by this study. The discussion puts forward the hypotheses on the relationship between the characteristics and SME performance, as well as participation, in production networks.

#### **a. Size**

This study addresses small and medium firms, and therefore, it does not seem logical in considering size as a candidate for a determinant of SME participation and performance in production networks. However, and as indicated in our sample and other studies, there is still large variation in the size across even the very narrow-defined small and medium firms. Hence, it turns out that size could be an important determinant.

Larger SMEs have higher chance to participate and perform better in production networks. Traditionally, the importance of size is related to scale economies in production. If economies of scale in production exist, large firms may outperform small ones in a low demand situation by setting lower prices.<sup>1</sup>

The perspective of the five internal resources for capacity building of SMEs (see discussion in the previous chapter) also motivates the positive size-performance relationship, particularly in the context of this study. Access to the many of these resources is likely to be stronger for larger firms. In general, it is reasonable to argue that larger firms have greater access to resources, including those deemed important for SMEs growth. Consider, for example, access to finance. Larger firms also tend to be better connected to banks or other formal sources of finance. Supporting this, Claessens et al. (2000) found that the bank-dependent firms in Asian countries are mostly large firms.

#### **b. Age**

The reasoning below suggests a hypothesis of positive relationship between firm age and SME performance, as well as, participation in production networks.

---

<sup>1</sup> While theoretically sounds, this argument sometimes does not fully backed up by evidence. Literature recorded mixed findings on the positive relationship between firm size and performance.

The importance of firm age is mostly related to the experience and knowledge that a firm is able to accumulate. Theoretical explanation can be derived from Jovanovic (1982) which postulates that overtime firms learn and improve efficiency. The experience and knowledge essentially come from many sources, but in the context of this study, the most likely source is networks of firms. These networks are particularly important because it facilitates peer-based learning and allows SMEs to reconfigure relations with suppliers (see the discussion in the previous chapter on this).

Firm age is also important because credit rationing can be expected to be more adversely affect smaller firms. Central to the proposition is that the risk associated with any loan varies with respect to the duration of relationships between firms and financial institutions (Diamond 1991).

Having mentioned the arguments above, a negative relationship involving firm age might also be observed. This is because adjustment generally is more difficult to happen in older firms – Jovanovic’s firm growth model indeed suggests a more dynamism of younger firms. Therefore, one could predict that it is much easier for younger SMEs to join a production network compared to the older ones.

### **c. Foreign Ownership**

Foreign ownership is hypothesized to positively related to SMEs performance and participation in production networks.

Forming a joint venture arrangement with foreign firms is clearly favourable strategy for any SME to engage and perform well in production networks. As discussed, doing so allows SMEs to exploit firm-specific assets owned by the foreign partners, and hence improve the competitiveness of the SMEs in global markets. In practice, the advantage of this mechanism usually comes from technology transfers and sometime from financial supports.<sup>2</sup>

The significance of foreign ownership, however, may depend on the share of the ownership. In other words, it depends on whether or not the foreign party control the domestic firm. Literature on multinationals indicates that foreign parent companies may

---

<sup>2</sup> In a more general firm performance context, Desai et al. (2004) and Blalock and Gertler (2005), for example, argue and show that domestic firms with share of foreign ownership are able to overcome financial difficulties during the 1997 Asian financial crisis.

restrict the transfer of the firm-specific assets if they do not hold a significant control over the domestic firms.

#### **d. Productivity**

Firm-level productivity is hypothesized to improve both the chance of SME participation into and performance in production networks. This hypothesis draws from the most recent findings in the research of firm exporting behaviour which find that exporters are more productive than non-exporters.<sup>3</sup> The superior productivity of exporters is due to what so-called 'selection hypothesis', which 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).

Even when a firm has managed to grow from non-exporter to become an exporter, productivity still matter for the exporter's overall performance. This comes from learning from what so-called 'learning-by-exporting hypothesis', which argues that there is a learning effect from participating in exporting activities which will result in productivity improvement.<sup>4</sup>

The logic coming out from the exporting literature can be applied in the context of SME participation in production networks, and hence it justifies our hypotheses. As explained, SMEs tend to suffer from many competitiveness issues, compared to larger firms. The fact that most of end products produced by networks of productions are exported final goods, it is sensible to argue that SMEs wanting to participate in production networks need to mimic the characteristics of exporters in general. The literature briefly reviewed above suggests that productivity matters in determining a firm ability to serve export markets. In the context of SMEs and production networks,

---

<sup>3</sup> Bernard *et al.*, (1995) and Bernard and Jensen (1999), for example, documented this for US manufacturing firms, while Aw and Hwang (1995) and Sjöholm and Takii (2003) document the same fact for the Taiwanese and Indonesian manufacturing, respectively.

<sup>4</sup> 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).

an important aspect of this perhaps is translated in the ability of SMEs in meeting strict requirement demanded by the higher – and larger – firms in networks of production.

The reasoning above also justifies our hypothesis that productivity is not only expected to improve the chance of SMEs to participate in production networks, but also to improve the SMEs' performance once they are already in the networks, and/or exporting at the same time.

#### **e. Financial Characteristics: Access to Finance and Financial Leverage**

SMEs with better access to finance are hypothesized to have higher chance to engage and perform well production networks. The potential for credit rationing – defined as the degree to which credit/loan is rationed, as an impact of imperfection in capital market (Stiglitz and Weiss 1981) – is thought to be higher for smaller firms. Petersen and Rajan (1994) argue that the amount of information that banks could acquire is usually much less in the case of small firms, because banks have little information about these firms' managerial capabilities and investment opportunities. The extent of credit rationing to small firms may also occur simply because they are not usually well-collateralized (Gertler and Gilchrist 1994).

Ability of a firm to get loan depends on the how the firm is able to service the debt. This, in turn, depends on the net worth of the firm, such as the value of cash inflow and liquid assets that the firm is able to generate. Lower net worth implies lower ability to service debt and hence it reduces the chance of a firm in getting loan or higher amount of credit. Banks, or any other lending institutions, are likely to attach high risk premium to firm with low net worth position.

SMEs that participate in production networks have a chance to have better cash flows than those that do not. SMEs in production networks have more certainty in terms of their production, since most of the time they operate based on larger, stable, and more certain buying orders from other firms in the networks. A more formal and modern managerial practice by firms operating in production networks, in addition to likelihood of more interactions with banks, also helps SMEs that operate in production networks to gain more 'trust' from banks or other formal financial institutions.

All these, which commonly known as the ‘balance sheet channel’ in financial economics literature, suggest that highly leveraged SMEs are expected to have lower chance to engage and perform well in production networks.<sup>5</sup>

#### **f. Innovation Efforts**

SMEs that have significant efforts to innovate are expected to have higher chance to engage and perform well in production networks. This study considers two types of innovation efforts: business- and technology-innovation effort. Business-innovation efforts improve various aspects of business strategies necessitated by firms that want to participate and grow in production networks. Efforts to meet international standards or widen business networks, for example, should improve the chance of SMEs in acquiring contracts from final assemblers or higher tier firms.

Technology-innovation efforts improve firms’ capability of production. As explained, SMEs are usually located in low tiers of production network. Here, an improved or better production capability is critical, because the high-tiers firms demands strict requirement for the goods supplied by SMEs. Technology-innovation efforts are widespread, including improving machinery and accumulating knowledge/know-how. Having an improved production process increases a chance of SMEs to participate in production networks.

#### **g. Location**

The basic economics of the fragmentation approach of production networks are production-blocks separation with some potential cost-saving benefits (Kimura and Ando 2005). As modelled by Kimura and Ando, here the ‘distance’ create what so-called ‘service-link costs’ that are borne because of the geographical distance between the blocks, including transportation cost, communication cost, intra-firm coordination cost, etc. Therefore, cost-saving benefits need to be borne from location-specific advantages. These include not only the traditional economic factors, such as wage-level

---

<sup>5</sup> See Bernanke (1993) for the review of literature and discussion about the ‘balance-sheet channel’ as well as other relevant subjects.

and resource availability, but also the existence and quality of infrastructure and infrastructure services, and the policies of the host-country's governments.<sup>6</sup>

SMEs which are located near the production blocks or ports offer some saving of the service-link costs borne by geographical distance. Hence, this study hypothesizes that SMEs located near industrial parks or export processing zones (EPZs), as well as located near ports, are hypothesized to have higher chance to participate and perform well in production networks. Industrial parks or EPZs are the common place for the establishment of the production blocks.

#### **h. Entrepreneurial and Managerial Attitudes**

Previous chapter discusses the importance of management and entrepreneurial attitudes in determining the performance of SMEs. This study considers these attitudes as potential determinants of SME participation and performance in production networks. Specifically, it hypothesizes that willingness to take risks or new business ideas improve the chance of SME in participating and performing well in production networks. Positive attitude towards risks and new business ideas is clearly necessary to be adopted by SMEs managers given the tight competition for operation in production networks. As explained, SMEs operating in production networks tend to face a constant and high survival threat, owing to the nature of SMEs involvement in production networks that usually buying contracts from larger firms in the networks.

### **5. Statistical Framework and Measurement of Variables**

Data for the empirical analysis are constructed from the survey results. The data integrate, or pool, the survey results from all countries participate in the survey. Considering the focus of small and medium enterprises, the analysis excludes the 'large' firms from the sample. Firm size is defined in terms of employment and the large firms are defined as those with employment of more than 200. In other words, the sample size contains observations of firms with maximum employment of 200.

---

<sup>6</sup> These policies include favorable investment climate, liberal trade policy, flexible labor policy, etc. (Kimura and Ando 2005).



Some adjustments have been made to prepare the data for this study. In most cases, this involves adjustments to make the data consistent and comparable across the countries. An example is transforming the unit value of sales from local currency to US dollars. Adjustments were made for some obvious errors in data entry process. As in the typical firm-level survey, there are always incomplete or missing information. This study, however, did not attempt to replace the missing information with its prediction value. This approach is taken to minimize the potential error from the prediction values, given that sometimes there is no certainty of whether or not the existence information from the survey is sufficient to produce reliable predictions. The adjustments made and missing information reduce quite significantly the number of observations for econometric analysis, from about 700 to 350 small and medium firms.

The determinants of SME participation in production networks is examined by way of statistical regression. The statistical model in its general form is given as the following:

$$PN_i = \gamma_0 + \Gamma'X_i + \varepsilon_i \quad (1)$$

where (1) is the equation for participation in production networks.  $i$  represent firm  $i$  and  $X_i$  is set of set of explanatory variables that capture firm characteristic determinants. Industry and country-group dummy variables are included for differences across industries and countries. The industry dummy variables identify whether firms are in the following sectors: garments, auto parts and components, electronics – including electronics parts and components, or other sectors. Meanwhile, country-group dummy variables identify whether a firm operates in the group of developed ASEAN countries (i.e., Thailand, Malaysia, Indonesia, and Philippine) or group of new ASEAN member countries (i.e., Cambodia, Lao PDR, and Vietnam).

The dependent variable, or  $PN_i$ , is a binary variable and identifies whether or not a firm participate in production networks. That is,  $PN_i = 1$  if a firm participates in production networks and  $PN_i = 0$  otherwise. A participated firm is defined if it meets the following requirements: first, it supplies to any tier in a network of production

defined by Abonyi (2005), and second, it either imports intermediate inputs or exports some of its products.<sup>7</sup>

Equation (1) is estimated within the framework of binary choice models (i.e., probit or logit model), instead of linear probability model (LPM). This is mainly because the predicted probability derived from LPM may lie outside the 0-1 region, which is clearly not reasonable in practice. Despite this, a binary response model also has a number of shortcomings. One important one is that the potential for bias arising from neglected heterogeneity (i.e. omitted variables) is larger in a binary choice model than in a linear model. Nevertheless, Wooldridge (2002) points out that estimating a binary response model by a binary choice model still gives reliable estimates, particularly if the estimation purpose is to obtain the direction of the effect of explanatory variables.

### **5.1. Measurement of Variables**

The following variables are employed to account for the hypothesized firm characteristics. Firm size 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 or macroeconomic variables. The head-count measure is chosen because the number of hours worked, which is the ideal measure of employment, is not available.

Meanwhile, age of firm is proxied by the number of years the plant has been in commercial production.

Foreign ownership is proxied by the percentage share of foreign ownership. This study does not consider the discrete measure of foreign ownership (i.e., dummy variable that identify whether a firm has foreign ownership share) because, as suggested by the literature, behaviour of foreign business partners in sharing their firm-specific assets depends on the extent of the ownership of the foreign investors in a joint venture firm.

This study employs output per labor as a proxy for labour productivity. Output is proxied by the sales of firms. The more traditional approach of using value added as numerator is not adopted because value added information is not available. However,

---

<sup>7</sup> See Figure 2 in Chapter 3 for the description of tiers and location of SMEs in a network of production.

the use of output is acceptable and in fact more appropriate because output is measured at firm level.

Loan interest rate is measured by the interest rate of the loan that SMEs in the sample are able to get. This tends to be firm-specific since it reflects the risk premium valued by the banks or other lending institutions that give the loan to the SMEs.

Meanwhile, this study employs interest coverage ratio, or ICR, to measure a firm financial leverage situation. It is defined as

$$(\text{Interest coverage ratio})_i = \frac{(\text{EBIT})_i}{(\text{interest payments})_i}$$

where EBIT is equal to sales (or earnings) before deduction of interest payments and income taxes.

Interest coverage ratio measures the number of times a firm's earnings exceed debt payments. In other words, it indicates how well a firm's earnings can cover interest payments. In general, a low ICR implies a firm is highly leveraged and has low capability to take on additional debt (i.e. more financially constrained).

It is worth mentioning that ICR is very approximate. This is because the ratio tends to understate the true extent of a firm's financial leverage. It focuses only on servicing the interest liability and does not take into account debt repayment. Usually, repayment of debt principal is higher than the interest payment, and therefore drains a larger amount of cash than the interest payment. In addition, the ratio does not take into account other mandatory and discretionary items, such as dividends and capital commitment, which are not included in the earnings figure.

Distance to industrial parks or EPZ and distance to ports are employed to measure the location characteristic. As the questionnaire asks, the distance variables are measured in terms of physical distance (i.e., kilometres) and time (i.e. hours). This study experiments with these two types of unit measurements in its empirical analysis.

As commonly applied in other empirical study, this study employs skill intensity variable to proxy the human capital resources of firm. It is defined as the ratio of non-production to production labour,

$$(\text{Skill intensity})_i = \frac{(\text{total number of employee with tertiary or vocational education status})_i}{(\text{total number of employee})_i}$$

To measure the extent of firm's business-innovation efforts, four dummy variables are created to identify whether a firm: (1) meets international standards, (2) introduces ICT, (3) establishes new divisions/plants, and (4) attends/ involves in business networking activities (e.g. business association, cooperation with other firms, R&D networks, etc.).

Meanwhile, to measure the extent of firm's technology-innovation efforts, four dummy variables are created to identify whether a firm: (1) buys new machines, (2) improves its existing machinery, (3) introduces new know-how or knowledge on production, and (4) introduces new products or services to markets.

The value of all of these variables is equal to unity if a firm conducted the effort attached to each of the variables in the past three months from the survey, or zero otherwise.

Two dummy variables are created to measure firm managerial and entrepreneurial attitudes. The first dummy variable is created to identify perception on taking business risks. It takes the value of unity if managers/owners have a positive attitude towards taking business risks or zero otherwise. The second dummy variable is created to identify willingness of the managers/owners in their willingness to adopt new business strategy. The variable takes the value of unity if there is a positive attitude towards adopting new business strategy or zero otherwise.

## 6. Results and Analysis

It is useful to describe some descriptive analysis before presenting and discussing the econometric results. To do so, we compare the 'average' value of SME characteristics between SMEs that participate and do not participate in production network. Table 1 shows mean value of some characteristics for these two groups. The table also compares the mean values and statistically determine whether or not they are different.

Table 6 indicates that SMEs participated in production networks are importantly different than those are not participated. As shown in Table 6, the participated SMEs in the sample are larger, younger, and involves more of foreign ownership than those the non-participated ones. All these characteristics are statistically difference. In terms of foreign ownership, the difference is quite substantial; that is, the share of foreign ownership of SMEs in the participated group, on average, is about two times higher than of the SMEs in non-participated one.

It is important to mention that although larger, the average of foreign ownership share in the participated group is below 51%. This means that, on average, foreigners/parent foreign partners are not likely be the dominant owner. The implication is that, SMEs are may not have a strong flow of information spillovers from their foreign partners. Nonetheless, the higher foreign ownership share in the participated group indicates that somehow, SMEs still benefits from their foreign partners for their participation in production networks.

**Table 6. Average Value of SME Characteristics, between SMEs Participated and Not Participated in Production Networks**

Characteristic	In Production Networks	Out of Production Networks	Statistically different
Size (employees)	66,2	52,1	Yes <sup>+</sup>
Age (years)	10,6	13,8	Yes <sup>**</sup>
Share of foreign ownership (%)	18,2	7,2	Yes <sup>**</sup>
Labor productivity (sales/employee, thousand USD)	26,8	23,0	No <sup>2</sup>
Loan interest rate (%)	6,1	8,9	Yes <sup>**</sup>
Interest Coverage Ratio, ICR <sup>4</sup>	250,0	77,5	Yes <sup>*</sup>
Credit interest rate (%)	6,2	8,9	Yes <sup>**</sup>
Distance to industrial parks or EPZs (hours)	1,0	0,9	No <sup>3</sup>
Distance to port (hours)	1,3	1,2	No <sup>3</sup>
Skill intensity <sup>5</sup>	0,4	0,3	Yes <sup>**</sup>

*Notes:*

1. + significant at 10%; \* significant at 5%; \*\* significant at 1%

2. Significant at 65% confidence level.

3. Significant at 60% confidence level.

4. ICR is defined as the ratio of sales to payment for interest.

5. Skill intensity is defined as the proportion of skilled labor (i.e., employees with tertiary and vocational education level) in a firm total employment)

*Source:* ERIA Survey on SME Participation in Production Networks

The descriptive results, surprisingly, do not show much difference in SME productivity level between the two groups. This is rather puzzling given that one would expect that productivity should be one of the most important firm-characteristics determinants. The final inference on the importance of productivity, however, needs to be confirmed by the econometric analysis.

Table 6 suggests that SMEs in production networks are less financially constrained. The ICR is significantly larger for these SMEs. The difference in the mean of ICR between the two groups is also statistically significant. The larger ICR suggests that SMEs in production networks are able to service their loans than SMEs that are not part of the networks.

The table further suggests that SMEs in production networks are better connected to financial sectors. This is indicated by the realized interest rate on the loan which, on average, is lower for SMEs in this group, compared to the average interest rate for SMEs out of production networks. Again, the difference in the interest rate is statistically different. Moreover, the difference is suggested to be quite large. As for SMEs in the sample, and on average, those participated group managed to get 3 percentage points lower of interest rate compared to those in non-participated group.

The differences in the average of firm financial characteristics give some support to the argument that SMEs in production networks have better cash-flow due to large, stable, and more certain buying order from other firms in the networks. Moreover, it also supports the idea that SMEs in production networks are able to convey more information to the bank which reduces the extent of asymmetric information. This improves the trust of banks, or other financial institutions, on these SMEs which then reduces the risk premiums assigned to the SMEs.

Meanwhile, Table 6 does not seem to suggest the importance of location in determining SME participation in production networks. It shows that there is not much difference in the distance to industrial parks or EPZ, and to ports. This is the distance when it is measured in terms of time (i.e., in terms of hours of journey). This study experiments with the distance in terms of geographical distance (i.e., in terms of kilometers) and the same results are achieved.

Table 7 and 8 presents attempt to show the 'average' characteristics of business- and technology-innovation efforts and managerial/entrepreneurial attitudes. Because of

the variables that represent these characteristics are dummy variables, the tables present the frequencies of SMEs with unity value of the dummy variables. The frequencies are produced for two groups, one for SMEs that participate in production networks and the other for SMEs that do not participate in the networks.

**Table 7. Innovation Efforts Characteristics, Frequency (in %) of SMEs Participated and Not Participated in Production Networks**

Characteristic	In Production Networks	Out of Production Networks	Statistically different
Met international standards (e.g. ISO, etc.)	44,4	36,5	Yes *
Introduced information and communication technology	35,5	36,0	No <sup>2</sup>
Established new divisions or plants	27,0	18,8	Yes *
Involved in business network activities	52,6	47,1	No <sup>3</sup>
Bought new machinery with new functionality	58,4	47,9	Yes **
Improving the existing machinery	72,5	59,1	Yes **
Introduced new know-how in production method	49,6	40,7	Yes *
Recently introduced new products	63,4	55,1	Yes *

*Notes:*

1. + significant at 10%; \* significant at 5%; \*\* significant at 1%
2. Significant at 10% confidence level.
3. Significant at 84% confidence level.

*Source:* ERIA Survey on SME Participation in Production Networks.

Table 7 indicates that SMEs in production networks conduct have superior characteristics in terms of their efforts in conducting business innovation. It shows that the number of SMEs that conducted the wide range of business innovation over the last three months is mostly larger for this group. The table suggests SMEs in and out of production networks are not different in terms of introducing ICT and being involved in business network activities, such as business association, R&D networks, etc. SMEs between these two groups are quite different in terms of efforts to meet international standards or establish new divisions/plants.

SMEs that operate in production networks seem to have stronger technology-innovation efforts. Table 7 shows that SMEs in this group adopted new production method, bought more of new machinery, and upgraded their existing machinery in the last over the last three months to the survey. Over this period, these SMEs also introduced new production know-how and knowledge more than those that do not participate in the production networks.

Table 8 suggests that SMEs participated in production network are different than those out of the networks in terms of managerial/entrepreneurial characteristics. There is larger number of SMEs that acknowledge the risks in doing business for the participated group. In other words, there more SMEs in participated group that have positive attitude towards business risks, compared to those in the non-participated group. Not only this, the table shows that the there is larger number of SMEs that have more willingness to adopt new business strategy in the group of participated SMEs, compared to those in the other group.

**Table 8. Managerial/entrepreneurial Characteristics: Frequency (in %) of SMEs Participated and Not Participated in Production Networks**

Characteristic	In Production Networks	Out of Production Networks	Statistically different
Considering risk in business operation	52,7	30,7	Yes**
Willingness to adopt new business strategy	42,3	26,6	Yes**

*Notes:*

1. + significant at 10%; \* significant at 5%; \*\* significant at 1%

*Source:* ERIA Survey on SME Participation in Production Networks

Table 9 reports the results of maximum likelihood estimation of equation (1) for the subset of sample which consists of all firms/SMEs with the maximum size of 200 employments. The table reports the final specifications that give the best results, while the other specifications estimated during experiment stage are not reported here in the table for the reasons of less favorable results. The Wald test of overall significance in all specifications passes at 1 percent level. The table reports robust standard errors for the reason of heteroscedastic variance.



**Table 9. Firm Characteristic Determinants of SMEs in Production Networks**

Independent variable	Dependent variable: (Participation in Production Network) <sub>i</sub>												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(Size) <sub>i</sub>	0.001 (1.60)	0.001 (1.56)	0.001 (1.45)	0.000 (0.40)	0.000 (0.33)	0.000 (0.33)	0.001 (0.63)	0.001 (0.65)	0.001 (0.77)	0.001 (0.88)	0.001 (0.49)	0.001 (1.31)	0.001 (1.19)
(Size <sup>2</sup> ) <sub>i</sub>	-0.000 (1.13)	-0.000 (1.59)	-0.000 (0.89)	0.000 (0.10)	0.000 (0.21)	0.000 (0.27)	-0.000 (0.10)	-0.000 (0.13)	-0.000 (0.23)	-0.000 (0.31)	0.000 (0.11)	-0.000 (0.70)	-0.000 (0.71)
ln(Age) <sub>i</sub>	-0.075 (0.69)	-0.055 (0.52)	-0.038 (0.55)	-0.049 (0.62)	-0.049 (0.63)	0.005 (0.06)	-0.038 (0.49)	-0.048 (0.62)	-0.042 (0.53)	-0.029 (0.36)	-0.063 (0.81)	-0.044 (0.63)	-0.040 (0.57)
(Labour productivity) <sub>i</sub>	0.004 (1.91)+	0.005 (1.88)+	0.003 (2.12)*	0.003 (2.01)*	0.003 (1.97)*	0.003 (2.29)*	0.003 (2.19)*	0.003 (2.04)*	0.003 (2.33)*	0.003 (2.30)*	0.003 (2.08)*	0.003 (2.44)*	0.003 (2.32)*
(Foreign ownership share) <sub>i</sub>	0.588 (1.97)*	0.533 (2.01)*	0.415 (2.18)*	0.330 (1.49)	0.402 (1.81)+	0.433 (1.97)*	0.425 (1.93)+	0.381 (1.74)+	0.430 (1.93)+	0.439 (1.98)*	0.403 (1.83)+	0.378 (1.93)+	0.403 (2.09)*
(Loan interest rate) <sub>i</sub>	-0.035 (2.71)**	-0.031 (2.52)*	-0.033 (2.72)**	-0.031 (2.41)*	-0.030 (2.33)*	-0.029 (2.26)*	-0.031 (2.43)*	-0.032 (2.46)*	-0.031 (2.35)*	-0.031 (2.37)*	-0.031 (2.41)*	-0.012 (1.07)	-0.013 (1.25)
(Interest Coverage Ratio) <sub>i</sub>	0.0002 (1.74)+	0.0002 (1.48)	0.0002 (2.42)*	0.0002 (2.69)**	0.0002 (2.65)**	0.0002 (2.47)*	0.0002 (2.64)**	0.0002 (3.00)**	0.0002 (2.56)*	0.0002 (2.40)*	0.0002 (2.65)**	0.0002 (2.41)*	0.0002 (2.52)*
(Skill intensity) <sub>i</sub>	-0.025 (0.06)	-0.022 (0.07)	-0.432 (2.48)*	0.148 (0.64)	0.083 (0.34)	0.166 (0.71)	0.143 (0.60)	0.136 (0.59)	0.142 (0.61)	0.204 (0.86)	0.073 (0.30)	-0.468 (2.61)**	-0.459 (2.58)**
(Distance to industrial parks or EPZs) <sub>i</sub>	0.096 (0.66)	0.161 (0.96)											
(Distance to port) <sub>i</sub>	0.160 (1.27)		0.168 (1.51)	0.152 (1.52)	0.174 (1.75)+	0.129 (1.32)	0.145 (1.49)	0.145 (1.49)	0.143 (1.47)	0.136 (1.37)	0.132 (1.34)	0.135 (1.35)	0.137 (1.42)

*Table 9 continues*

Table 9. continued

Independent variable	Dependent variable: (Participation in Production Network) <sub>i</sub>												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(Dummy variable for meeting international standard) <sub>i</sub>				0.298 (2.14)*									
(Dummy variable for have introduced ICT) <sub>i</sub>				0.352 (2.30)*									
(Dummy variable for have established new divisions) <sub>i</sub>					0.603 (3.69)**								
(Dummy variable for involving in business networks) <sub>i</sub>						0.151 (1.11)							
(Dummy variable for acquiring new machinery) <sub>i</sub>							0.256 (2.05)*						
(Dummy variable for improving existing machinery) <sub>i</sub>								0.414 (3.31)**					
(Dummy variable for acquiring production knowledge) <sub>i</sub>									0.417 (3.18)**				
(Dummy variable for ability of introducing new products) <sub>i</sub>										0.312 (2.36)*			
(Dummy variable for considering risk in business operation) <sub>i</sub>											0.361 (3.25)**		
(Dummy variable for willingness to adopt new business strategy) <sub>i</sub>													0.238 (2.06)*

Table 9. continues

Table 9. concluded

Independent variable	Dependent variable: (Participation in Production Network) <sub>i</sub>												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(Dummy var. for garment sector) <sub>i</sub>			-0.047 (0.33)	0.048 (0.30)	0.042 (0.25)	0.039 (0.24)	0.002 (0.01)	-0.014 (0.08)	-0.004 (0.02)	0.079 (0.47)	-0.015 (0.09)	-0.057 (0.40)	-0.052 (0.37)
(Dummy var. for auto parts and components) <sub>i</sub>			0.394 (2.29)*	0.289 (1.41)	0.378 (1.81)+	0.305 (1.44)	0.263 (1.26)	0.232 (1.12)	0.272 (1.30)	0.365 (1.71)+	0.208 (0.98)	0.408 (2.35)*	0.398 (2.31)*
(Dummy var. for electronics, and electronics parts and component) <sub>i</sub>			0.259 (1.55)	0.355 (1.88)+	0.400 (2.12)*	0.394 (2.08)*	0.372 (1.98)*	0.334 (1.81)+	0.352 (1.88)+	0.447 (2.36)*	0.307 (1.64)	0.264 (1.56)	0.259 (1.54)
(Dummy var. for country group) <sub>i</sub>			1.163 (8.27)**	1.210 (7.77)**	1.319 (8.32)**	1.273 (8.02)**	1.238 (7.93)**	1.168 (7.47)**	1.148 (7.34)**	1.264 (8.01)**	1.166 (7.45)**	1.092 (7.65)**	1.139 (8.09)**
Constant			-1.259 (5.21)**	-1.769 (3.13)**	-1.862 (3.29)**	-2.014 (3.69)**	-1.803 (3.10)**	-1.781 (3.20)**	-2.030 (3.45)**	-2.550 (3.84)**	-1.689 (2.98)**	-1.330 (5.50)**	-1.303 (5.42)**
Observations	543	543	713	543	543	542	541	543	543	539	540	713	713

Notes:

1. Robust z statistics in parentheses
2. \*\* significant at 1%;  
 \* significant at 5%;  
 + significant at 10%,

Specification (1) to (3) are the baseline. They consider all variables except the dummy variables for the innovation efforts and managerial/entrepreneurial attitudes. These specifications are different in the way of how distance variables are included in the regression. Specification (1) include both of the distance variables, i.e., the distance to industrial parks or EPZs, while specification (2) and (3) enter each of these variables separately. Specification (1) and (2) are motivated because of potential collinearity of the two distance variables.

The key point of coming out from these specifications is the evidence that location is not an important determinants of SME participation in the networks. The estimated coefficients of the two distance variables are all statistically not significant across the specifications. In addition, all of these coefficients are positive, which are not as hypothesized.

A possible explanation points to the role of infrastructure. If theory and other empirical studies underlines that distance matter because it increases the ‘service-link costs’, good transport infrastructure could cut the disadvantage of being far from clusters of firms such as in industrial parks or EPZ which usually shelters firms that involved in production networks. This proposition deserves some supports. According to the ‘flowchart approach’ of cluster development (Kuchiki 2005), good infrastructure facilities are necessary to attract both so-called ‘anchor firms’ as well as other firms that support these firms. Firms that support these anchor firms in many cases are SMEs.

Firm productivity determines the participation of SMEs in production networks. The estimated coefficients of labor productivity are positive and, more importantly, statistically significant at 1 percent level in most of specifications. This is one of the robust findings coming out from the regressions. This finding supports our hypothesis of positive relationship between productivity and SME participation in production networks. Moreover, it accords to our argument that SMEs who plant to participate in production networks need to prepare themselves by mimicking the characteristics of exporting firms in general, and one of the most important characteristics is superior productivity – compared to non-exporting firms. As an example, a superior productivity level of SMEs operating in production networks is clearly needed given the usually strict requirement of goods produced demanded by other firms in the higher tiers of the networks.

The results suggest that foreign ownership significantly determines the participation of SMEs in production networks. This accords our hypothesis on the characteristic foreign ownership and is consistent with the key observation pulled out from the descriptive statistics presented earlier. Moreover, the magnitude of foreign ownership in determining the participation is large, indicated by the larger value of the estimated coefficients across all specifications. Foreign ownership, however, is not as important as labor productivity in determining the SME participation. The statistical significance of the estimated coefficient is only moderately, switching either at 5 or 10 percent significance level across the specifications.

Nonetheless, this finding, together with that from the descriptive analysis, supports the argument that SMEs are able to exploit firm-specific assets owned by their foreign partners to improve their competitiveness – something that is really needed for the SMEs' successful performance in production networks. The high impact of foreign ownership variable, meanwhile, indicates that SMEs are able to get high marginal benefit from having greater involvement of foreign investment in their firms. This clearly underlines a strong dependency of how much firm-specific assets or knowledge can be shared to SMEs on the shares of foreign ownership.

SMEs that conduct more actively business-innovation activities are suggested to have higher chance to participate in production networks. The estimated coefficient of the three – out of four – dummy variables of business-innovation efforts is positive and statistically significant. These are shown in the results of specification (4) to (7). The only business-innovation efforts variable that is not significant is the dummy variable for attending business networks (e.g. business associations). This confirms the earlier observation from the descriptive analysis which indicates that SMEs participated in production networks are not much different with those out of the networks in terms of business innovation activities they do.

Strong efforts in conducting technology innovation significantly determine SME participation in the networks. The estimated coefficients of all dummy variables that represent these efforts are positive and statistically significant. These are shown in the results of specification (8) to (11). The results suggest that the efforts of SMEs in conducting more actively technology innovation process significantly increase a chance of SMEs to participate in production networks. Moreover, the impact of the innovation

efforts is quite large, as it is indicated by the large value of the estimated coefficients, at least relative to the estimated coefficients of the dummy variables that represent business-innovation efforts.

The finding on the innovation efforts underlines the importance of having all necessary technology and know-how if for both getting invitation to participate in as well as survive better in production networks. As noted, production networks pose a hostile environment to SMEs, which mostly comes from strict product requirement that clearly needs adoption of advanced technology and a characteristic of SMEs that they tend to be located at lower tiers of production networks.

The results suggest that the characteristic of firm toward risk or adoption of new business idea is an important determinant of SMEs participation in production networks. The estimated coefficients of the two dummy variables that represent this, i.e., consideration on risk in business operation and willingness to adopt new business strategy are all positive and statistically significant. The magnitude of the coefficient further suggests the importance of this characteristic in increasing the probability of SMEs to participate in production network. This finding is consistent with the view that SMEs in production networks operate in a tough business environment and faces a constant and continuously survival threat. While it is not immediately relevant, it is worth mentioning that the results provide supports for the importance of psychological factors in determining performance of SMEs in general.

The result on skill intensity variable does not accord our prediction. The estimated coefficient changes sign across the specifications. In most cases, the coefficients are usually not statistically significant when they are positive (i.e., the predicted sign) but they are statistically significant when the sign is not the predicted one. This is rather surprising given the results of the other variables. However, this may be caused by strong correlation of skill intensity variables with the other variables, in particular the dummy variables for innovation efforts. It is natural to expect that firms with strong innovation efforts tend to employed more skilled workers than those with weak technological capability.

The econometric results confirm our earlier observation on the relationship between, on the one hand access to finance or financial leverage, and on the other, SME participation in production networks. It is now more convincingly to conclude that both

of these characteristics determine the chance of SME participation in production networks. In particular, stronger access to financial institutions increases the chance of SMEs to participate in production networks. As noted, the results indicate that SMEs participated in the networks suffer from lower credit-rationing problem, which arises from incomplete information, than those operated outside of the networks. This is another important characteristic to bear in mind. Meanwhile, higher chance to participate in production network is attached SMEs which are able to service their debts. This is apparent from the results of ICR variable. However, the impact of financial leverage characteristic is small, as it is indicated by the very small estimated coefficient of this variable.

## **7. Stairway to Higher-quality Production Networks**

This section extends the analysis of the previous sections by focusing more on firms/SMEs that participate in production networks. It relies on the framework of quality-intensity nexus in production networks explained in the previous chapter. Groups of firms operating in production networks can be classified into four types according to different quality and intensity, as those drawn by Figure 3 of Chapter 3.

This section examines the low- and high-quality groups in its empirical analysis. Relying on the quality-intensity nexus framework, this section asks question of how the constraints to grow are different between the two groups and how an SME can move from the low to the high group. This means that the analysis takes a comparison of firms in both quadrant II and III with firms in quadrant I and IV, referring to Figure 1. As explained, the low quality group is defined to consist of firms in Tier 3 and/or 4 of a production network structure. The high quality one, meanwhile, is defined to consist of firms in Tier 1 and/or 2.

## 7.1. Constraints and Assistances to the Surveyed SMEs Distinguished by Their Quality in Production Network

In order to move our discussion on the perception of constraints and assistances to SMEs one step further, we divide those SMEs that are in production networks into two groups. For those that are in higher quality of production networks, they belong to the top tier in the production network and the rest are in lower quality production networks.

**Table 10. Ranked Top-Ten Constraints Faced by SMEs**

Rank	In Low Quality Production Network	In Higher Quality Production Network
1	B35. Perceived risks in your current and new business operations	B30. Political instability (home)
2	B14. Offering competitive prices to customers	B28. Poor/deteriorating economic conditions (home)
3	B19. Establishing and maintaining trust with business partners	B31. High tax and tariff barriers (home)
4	B6. Lack of production capacity to expand	B14. Offering competitive prices to customers
5	B1. Limited Information to locate/analyze markets/business partners	B19. Establishing and maintaining trust with business partners
6	B28. Poor/deteriorating economic conditions (home)	B1. Limited Information to locate/analyze markets/business partners
7	B15. Difficulty in matching competitors' prices	B9. Developing new products
8	B21. Excessive transportation/insurance costs	B29. Inadequacy of basic and IT infrastructure (home)
9	B2. Unreliable market data (costs, prices, market shares)	B35. Perceived risks in your current and new business operations
10	B4. Lack of managerial time to identify new business opportunities	B37. Willingness to adopt new business strategy or ideas

Source: ERIA – SMEs Survey (2009).

Table 10 shows the top ten out of 44 constraints faced SMEs distinguished by their quality in production networks. For those that are in lower quality of production network, “Perceived risks in your current and new business operations” under “Other Barriers” category ranks top, followed by “offering competitive prices to customers” and “difficulty in matching competitors' prices” of “Product and Price Barriers” category that are ranked second and seventh. Ranked third and eighth are “establishing and maintaining trust with business partners” and “excessive transportation/insurance costs” that are in “distribution, logistics and promotion barriers” category. The “lack of production capacity to expand” and “lack of managerial time to identify new business



opportunities” that are ranked fourth and tenth are under the “Functional barriers” category. The rest are in “Informational Barriers” and “Business environment barriers” category.

For those that are in higher quality of production network, the perception of their constraints is quite different from those in the lower quality. The top two constraints are “Political instability (home)”, “poor/deteriorating economic conditions (home)”, and eighth “Inadequacy of basic and IT infrastructure (home)” are under the “Business environment barriers” category. They are followed by “high tax and tariff barriers (home)”, “offering competitive prices to customers”, “establishing and maintaining trust with business partners”, “limited Information to locate/analyze markets/business partners”, “developing new products” , “perceived risks in your current and new business operations”, and “willingness to adopt new business strategy or ideas” that are belong to “Tax, tariff and non-tariff barriers”, “Product and price barriers”, “Distribution, logistics and promotion barriers”, “Informational Barriers”, “Functional barriers”, and “Others barriers” category.

However, when ranked by main category, “Product and price barriers”, “Functional barriers”, and “Business environment barriers” are the top main constraints faced by both groups of SMEs in quality production network as shown by Table 11. “Informational Barriers”, and “Others barriers” category rank lowest.

In summary, constraints faced by SMEs are different between those that are in lower quality production network than those in the higher quality one seeing from the top ten and detailed rankings of constraints. For those that are in lower quality of production network, internal constraints are critical to them in contrast to external constraints faced by those that are in higher quality of production network.

**Table 11. Ranked Constraints by Category Faced by SMEs and their Quality in Production Network**

Rank	In Low Quality Production Network	In Higher Quality Production Network
1	Product and price barriers	Product and price barriers
2	Business environment barriers	Functional barriers
3	Functional barriers	Business environment barriers
4	Procedural barriers	Distribution, logistics and promotion barriers
5	Distribution, logistics and promotion barriers	Procedural barriers
6	Tax, tariff and non-tariff barriers	Tax, tariff and non-tariff barriers
7	Informational barriers	Informational barriers
8	Other barriers	Other barriers

*Source:* ERIA – SMEs Survey (2009).

The effectiveness and needs for assistances are shown by Table 12. On average, 60 % of SMEs in both groups of quality in production network have reported received assistances. “Financing”, “Overall improvement in investment climate” and “Technology development and transfer” are reported to be effective for those that are in lower quality of production network. “Counseling and advice”, and “Training” are the less effective. However, judging from the needs for assistances, “Overall improvement in investment climate” and “Financing” are ranked top the list underlying the critical supports for those SMEs that are in lower quality of production network.

For those that are in higher quality of production network, “Financing”, “Technology development and transfer”, and “Business linkages and networking” are ranked the most effective supports they have received. “Information” and “Counseling and advice” are the less effective. For the needs for assistances, they rate “Overall improvement in investment climate”, “Business linkages and networking” and “Financing” are top priority for them implying that continuing effective supports in

these areas are very important for those SMEs that are in higher quality of production network.

In summary, about 60 % of SMEs in both groups of quality in production network have reported received assistances. Among others, “Financing” continues to be the pressing needs of supports together with “Overall improvement in investment climate” for both groups. However, support in “Information” is more important for that are in lower quality of production network and “Business linkages and networking” for those that are in higher quality of production network.

**Table 12. Ranked Effectiveness and Perception of Needs-Assistance to the Surveyed SMEs by Degree of Importance and Quality in Production Network**

Rank	Low Quality Production Network			High Quality Production Network		
	Effectiveness of Assistance		Perception of Needs-Assistance	Effectiveness of Assistance		Perception of Needs-Assistance
	Rank (mean)	% of Assisted SMEs		Rank	% of Assisted SMEs	
1	Financing	55.8	Overall improvement in investment climate	Financing	56.4	Overall improvement in investment climate
2	Overall improvement in investment climate	63.0	Financing	Technology development and transfer	54.3	Business linkages and networking
3	Technology development and transfer	56.5	Information	Business linkages and networking	62.8	Financing
4	Business linkages and networking	70.1	Business linkages and networking	Training	64.9	Training
5	Information	74.0	Training	Overall improvement in investment climate	59.6	Information
6	Counseling and advice	57.1	Counseling and advice	Information	66.0	Technology development and transfer
7	Training	59.1	Technology development and transfer	Counseling and advice	50.0	Counseling and advice

Table 13 below shows estimation results for the firm characteristic determinants of a better-quality SMEs that participate in production network. It attempts to answer the second question posted by this section by gauging which characteristics that allow SMEs to move toward better-quality SMEs (i.e., moving from tier 3 or 4 to tier 1 or 2). The estimations utilized the ordinal logit model that allows identification of a firm/SME according to the different quality of its participation in production networks. Thus, it estimates the general form of statistical model:

$$QPN_i = \gamma_0 + \Gamma'X_i + \varepsilon_i \quad (2)$$

where  $QPN_i$  is a discrete choice variable and  $QPN_i = 1$  if a SME operate as firm in Tier 3 or 4 (i.e., low-quality SME) and  $QPN_i = 2$  if a SME operate as firm in Tier 1 or 2 (i.e., high-quality SME).  $i$  represent firm  $i$  and as in the previous section,  $X_i$  is set of set of explanatory variables that capture firm characteristic determinants. Estimations also include dummy variable for industries and country groups. Estimations are conducted only on the sample of SMEs that participate in production networks, which give the number of observation of about 190 firms/SMEs.

The results presented in Table 13 indicate rooms for improvement for SMEs that have successfully participate in production networks. This is indicated by the importance some characteristics from the estimation results.

**Table 13. Firm Characteristic Determinants of Better-quality SMEs Participated in Production Network**

	Dependent variable: (Dummy variable for the quality of participation in production networks) <sub>i</sub>									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(Size) <sub>i</sub>	0.010 (2.60)**	0.009 (2.23)*	0.011 (2.93)**	0.010 (2.67)**	0.011 (2.86)**	0.011 (2.87)**	0.013 (3.32)**	0.011 (2.89)**	0.011 (2.85)**	0.010 (2.70)**
(Size <sup>2</sup> ) <sub>i</sub>	-0.000 (0.68)	-0.000 (0.55)	-0.000 (0.80)	-0.000 (0.67)	-0.000 (0.85)	-0.000 (0.76)	-0.000 (0.77)	-0.000 (0.76)	-0.000 (0.73)	-0.000 (0.63)
ln(Age) <sub>i</sub>	0.102 (0.47)	0.090 (0.41)	0.089 (0.41)	0.138 (0.63)	0.138 (0.63)	0.112 (0.52)	0.073 (0.33)	0.086 (0.40)	0.078 (0.36)	0.096 (0.44)
(Labour productivity) <sub>i</sub>	0.010 (1.96)*	0.010 (2.00)*	0.009 (1.91)+	0.009 (1.97)*	0.010 (2.07)*	0.010 (2.06)*	0.009 (1.97)*	0.009 (1.92)+	0.010 (2.06)*	0.009 (1.97)*
(Foreign ownership share) <sub>i</sub>	1.276 (2.66)**	1.438 (2.96)**	1.329 (2.78)**	1.336 (2.80)**	1.278 (2.67)**	1.320 (2.75)**	1.226 (2.56)*	1.279 (2.67)**	1.294 (2.72)**	1.401 (2.90)**
(Loan interest rate) <sub>i</sub>	-0.067 (1.66)+	-0.070 (1.71)+	-0.073 (1.79)+	-0.076 (1.84)+	-0.074 (1.82)+	-0.070 (1.70)+	-0.077 (1.81)+	-0.063 (1.58)	-0.063 (1.60)	-0.066 (1.59)
(Interest Coverage Ratio) <sub>i</sub>	-0.0001 (0.32)	-0.0001 (0.39)	-0.0001 (0.16)	-0.0001 (0.35)	-0.0001 (0.30)	-0.0001 (0.27)	-0.0001 (0.58)	-0.0001 (0.33)	-0.0001 (0.31)	-0.0001 (0.12)
(Skill intensity) <sub>i</sub>	-0.018 (0.03)	-0.420 (0.66)	0.051 (0.09)	0.107 (0.18)	0.132 (0.22)	0.041 (0.07)	0.210 (0.35)	0.104 (0.18)	0.058 (0.10)	0.167 (0.28)
(Distance to port) <sub>i</sub>	-0.144 (0.78)	-0.095 (0.51)	-0.132 (0.72)	-0.201 (1.08)	-0.189 (1.02)	-0.153 (0.84)	-0.062 (0.33)	-0.157 (0.83)	-0.185 (1.04)	-0.228 (1.24)

*Table 13 continues*

Table 13 continued

	Dependent variable: (Dummy variable for the quality of participation in production networks) <sub>i</sub>									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(Dummy variable for meeting international standard) <sub>i</sub>	0.210 (0.56)									
(Dummy variable for have introduced ICT) <sub>i</sub>		0.976 (2.41)*								
(Dummy variable for have established new divisions) <sub>i</sub>			-0.168 (0.44)							
(Dummy variable for involving in business networks) <sub>i</sub>				0.457 (1.36)						
(Dummy variable for acquiring new machinery) <sub>i</sub>					0.197 (0.58)					
(Dummy variable for improving existing machinery) <sub>i</sub>						0.036 (0.10)				
(Dummy variable for acquiring production knowledge) <sub>i</sub>							0.908 (2.51)*			
(Dummy variable for ability of introducing new products) <sub>i</sub>								-0.106 (0.30)		
(Dummy variable for considering risk in business operation) <sub>i</sub>									0.078 (0.24)	
(Dummy variable for willingness to adopt new business strategy) <sub>i</sub>										0.646 (1.94)+

Table 13 continues

Table 13 Concluded

	Dependent variable: (Dummy variable for the quality of participation in production networks) <sub>i</sub>									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(Dummy var. for garment sector) <sub>i</sub>	0.564 (1.27)	0.651 (1.45)	0.505 (1.15)	0.513 (1.16)	0.611 (1.38)	0.563 (1.29)	0.755 (1.65)+	0.573 (1.31)	0.581 (1.34)	0.579 (1.33)
(Dummy var. for auto parts and components) <sub>i</sub>	-0.392 (0.72)	-0.302 (0.55)	-0.412 (0.75)	-0.388 (0.70)	-0.273 (0.50)	-0.311 (0.57)	-0.451 (0.80)	-0.355 (0.64)	-0.308 (0.57)	-0.318 (0.59)
(Dummy var. for electronics, and electronics parts and component)	-0.202 (0.41)	-0.157 (0.31)	-0.184 (0.37)	-0.256 (0.51)	-0.177 (0.36)	-0.148 (0.30)	-0.275 (0.55)	-0.198 (0.39)	-0.150 (0.30)	-0.175 (0.35)
(Dummy var. for country group) <sub>i</sub>	-0.373 (0.78)	-0.067 (0.13)	-0.318 (0.67)	-0.401 (0.83)	-0.324 (0.69)	-0.281 (0.60)	-0.437 (0.88)	-0.471 (1.00)	-0.353 (0.78)	-0.333 (0.72)
Observations	195	195	194	193	195	196	193	193	198	198

Notes:

1. Robust z statistics in parentheses
2. \*\* significant at 1%;  
     \* significant at 5%;  
     + significant at 10%,



Participating SME with higher size has a chance to improve their position in production network, or to move to higher tiers. The estimated coefficient of size is positive and very statistically significant at 1 percent level. It is worth mentioning that this finding is in contrast with the role of size in determining SME participation in production networks (i.e., the econometric analysis in the previous section). This suggests that SMEs only exploits the source of competitiveness from economies of scale when they have successfully established their operation in production networks; they do not really exploit the economies of scale at the stage when they are about to establish their operation in the networks. This is consistent with the view that competitive struggle among firms is more intensive or severely in production networks, compared to those out of the networks.

Foreign ownership seems to be really important for upgrading the tiers of SMEs, or for moving SMEs to high-quality level of SMEs in production networks. The estimated coefficient of foreign ownership is very large and statistically significant across the specifications. Moreover, the value of the estimated coefficients suggests that the effect of foreign ownership is significant. The estimated coefficients across the specifications suggest that a 10 percentage point increase in foreign ownership share increases the chance of an SME to move to higher tiers in production network by about 12 times, *ceteris paribus*.

Similar to the finding on size, foreign ownership seems to gain significant role only when firms/SMEs are already in production networks. Again, this is sensible given the more intensive firm competition inside the networks, which makes the marginal value of every unit of shared foreign-specific much larger than that outside production networks. However, as the previous analysis shows, foreign ownership still play a crucial role in improving a chance of SMEs to start participate in production networks.

Productivity still matters even SMEs have successfully established their operation in production networks. The estimated coefficients of labor productivity across the specification are positive and statistically significant, mostly at 5 percent level. Thus, higher productivity facilitates SMEs to move up to higher tiers, toward becoming good-quality SMEs in production networks. The finding on productivity is consistent with the finding on foreign ownership. Analytically, this suggests that SMEs, or firms in general in this matter, really tend to mimic the characteristics of strong exporting firms.

The fact that foreign ownership and labor productivity still play their important role indicates a continuously learning process even firms/SMEs have already established their position in networks of production.

Firm's innovation effort determines quality upgrading of SMEs toward the higher tiers. There is, however, rather weak evidence on this, at least when one compares with the finding of these characteristics for the determinants of SME participation in production networks. This is because, unlike this finding, only two out of eight innovation-efforts variables that are positive and statistically important, and these are the dummy variable for have introduced ICT and the dummy variable for acquiring production knowledge. The estimated coefficients of the other variables are very statistically insignificant, indicating that they do not play the role for upgrading to the higher tiers.

The characteristic of firm toward risk does not seem to create a strong impact for upgrading SMEs into a higher tier. While the estimated coefficient of the two variables that represent this characteristic are is positive, there is only one estimated coefficient that is statistically significant, and this is the estimated coefficient of the dummy variable for willingness to adopt new business strategy.

## **8. Summary and Conclusion**

This chapter provides empirical investigation on the participation of SME in production networks. It attempts to reveal the constraints to growth and firm characteristics determinants of SME participation in production networks. It builds on the background and analytical framework presented in the previous chapter in its approaches to the investigation and analysis.

The empirical investigation relies on the results of the *ERIA Survey on SME Participation in Production Networks*, which was conducted over the period two to three months period at the end 2009 in most of ASEAN countries and China. The ASEAN countries covered are Thailand, Indonesia, Malaysia, Philippines, Vietnam, Cambodia, and Laos PDR.

The survey results on the perception of constraints faced by SMEs reaffirm that most surveyed SMEs are operating under severe constraints internal to them. For all SMEs in the survey, both the detailed and main category ranking of constraints is consistently high on “Functional Barriers” and “Product and Price Barriers”. However, the “Informational barriers” seems to be lower for SMEs that are in the production network compared with for the whole sample and those SMEs that are not in the production network. Less than half of SMEs in the surveyed sample have received assistances from NOGs or government. Even though most of SMEs are satisfied with the assistances in “Financing”, it still appears to be the most important area of supports underlying the fundamental constraints faced and relevant of supports needed by all SMEs. On top of that for SMEs in general and those that are not in the production network, supports in “Information”, “Business linkages and networking”, and “Training” are their most wanted supports. However, for SMEs that are in the production network, “Overall improvement in investment climate”, “Financing”, and “Business linkages and networking” are the top three supports they need.

The conclusion from these perceptions is clearly indicative for a further empirical investigation on the firm characteristics that determine SME participation and performance in production networks. The other part of the study addresses this.

The descriptive and econometric analyses suggest that productivity, foreign ownership, financial characteristics, innovation efforts, and managerial/entrepreneurial attitude are the important firm characteristics that determine SME participation in production networks.

The descriptive analysis finds that SMEs participated in production networks are importantly different than those are not participated. They are larger, younger, and involves more of foreign ownership than those the non-participated ones. Regarding foreign ownership, SMEs may not receive strong flow of information spillovers from their foreign partners. This is because the average of foreign ownership share is less than 51%. Nonetheless, the higher foreign ownership share in the participated group indicates that somehow, SMEs still benefits from their foreign partners for their participation in production networks.

Firm productivity determines the participation of SMEs in production networks. The estimated coefficients of labor productivity from estimations are positive and

statistically very significant. This finding is robust. It supports our hypothesis of positive relationship between productivity and SME participation in production networks. Moreover, it accords to our argument that SMEs who plan to participate in production networks need to prepare themselves by mimicking the characteristics of exporting firms, one of which is high level of productivity. The superiority in productivity is needed given the strict requirement of goods produced by other firms in participated in production networks.

SMEs that actively conduct innovation activities seem to have higher chance to participate in production networks. The innovation efforts here covered those related to the activities made improvement in terms of business strategies and technological capability. This finding is consistent with the idea that firms need to be more productive if they wish to engage in production network activities.

SMEs in production networks are less financially constrained and have better access to financial sector. The latter is indicated in the descriptive analysis by the lower loan interest rate these SMEs, compared to those not participated in the networks. These findings, particularly the former, suggest that SMEs in production networks have better cash-flow due to large, stable, and more certain buying order from other firms in the networks. The findings also support the idea that SMEs in production networks are able to convey more information to the bank which reduces the extent of asymmetric information.

The characteristic of firm toward risk or adoption of new business idea is another important determinant. The estimated coefficients of the two dummy variables that represent this, i.e., consideration on risk in business operation and willingness to adopt new business strategy are all positive and statistically significant. The coefficient further suggests that the impact this characteristic is large. This finding is consistent with the view that SMEs in production networks operate in a tough business environment and faces a constant and continuously survival threat, because SMEs will not have a favourable survival chance if they are reluctant to accept new ideas and not willing to face the risky business in the networks.

Empirical analyses in this chapter also consider the issue of SMEs in moving up tiers in a network of production, from the low- to high-quality Tiers. First, in terms of the constraints to grow, SMEs are different between those that are in lower quality

production network than those in the higher quality one seeing from the top ten and detailed rankings of constraints. For those that are in lower quality of production network, internal constraints are critical to them in contrast to external constraints faced by those that are in higher quality of production network. About 60 % of SMEs in both groups of quality in production network have reported received assistances. Among others, “Financing” continues to be the pressing needs of supports together with “Overall improvement in investment climate” for both groups. However, support in “Information” is more important for that are in lower quality of production network and “Business linkages and networking” for those that are in higher quality of production network.

Meanwhile, the econometric analysis reveals that size, productivity, foreign ownership, and to some extent, financial characteristics, innovation efforts, and managerial attitude, as the important firm characteristics to upgrade the Tier position of SMEs in production networks. The finding on size suggests that SMEs really exploits competitiveness from economies of scale only when they are able to engage in the networks. This behavior is also implied by foreign ownership and productivity.

## References

- Abonyi, G. (2005) "Integrating SMEs into Global and Regional Value Chains: Implications for Subregional Cooperation in Greater Mekong Subregion." Prepared for UNESCAP, Bangkok.
- Aw, Bee Y. and A.R. Hwang (1995) "Productivity and Export Market: A Firm-level Analysis." *Journal of Development Economics*, 47(2), pp.313-32.
- Barney, J. (1992) "Integrating Organizational Behavior and Strategy Formulation Research: A Resource-based Analysis." In P. Shrivastava, A. Huff, and J. Dutton (eds.), *Advances in Strategic Management*. Greenwich, CT: JAI Press, pp. 39-62.
- Bernanke, B. (1993) "Credit in the Macroeconomy." *Federal Reserve Bank of New York Quarterly Review*, 18(1), pp.50-70.
- Bernard, A.B. and J.B. Jensen (1999) "Exceptional Exporter Performance: Cause, Effect, or both?" *Journal of International Economics*, 47(1), pp.1-25.
- Bernard, A.B., J.B. Jensen and R.Z. Lawrence (1995) "Exporters, Jobs, and Wages in U.S. Manufacturing: 1976-1987." *Brookings Papers on Economic Activity, Microeconomics*, 1995, pp.67-119.
- Blalock, G. and P. Getler (2004) "Learning from Exporting Revisited in a Less Developed Setting." *Journal of Development Economics*, 75(2), pp. 397-416.
- Claessens, S., S. Djankov and L.C. Xu (2000) "Corporate Performance in the East Asian Financial Crisis." *World Bank Research Observer*, 15(1), pp.23-46.
- Desai, M., C.F. Foley and K.J. Forbes (2004) "Financial Constraints and Growth: Multinational and Local Firm Responses to Currency Crisis." *NBER Working Paper Series*, No. 10545, Cambridge, MA: NBER.
- Diamond, D. (1991) "Monitoring and Reputation: The Choice Between Bank Loans and Directly Placed Debt." *Journal of Political Economy*, 99(4), pp.688-721.
- Dierickx, I. and K. Cool (1989) "Asset Stock Accumulation and Sustainability of Competitive Advantage." *Management Science*, 35(12), pp.1504-11.
- Geroski, P.A. (1998) "An Applied Econometrician's View of Large Company Performance." *Review of Industrial Organization*, 13(6), pp.271-93.
- Gertler, M. and S. Gilchrist (1994) "Monetary Policy, Business Cycles and the Behavior of Small Manufacturing Firms." *Quarterly Journal of Economics*, 109 (2), pp.309-340.
- Jovanovic, B. (1982) "Selection and the Evolution of Industry." *Econometrica*, 50 (3), pp.649-70.
- Kimura, F. and M. Ando (2005a) "Two-dimensional Fragmentation in East Asia: Conceptual Framework and Empirics." *International Review of Economics and Finance*, 14, pp.317-48.

- Kuchiki, A. (2005) "A Flowchart Approach." In A. Kuchiki and M. Tsuji (eds.), *Industrial Cluster in Asia: Analyses of Their Competition and Cooperation*. New York: Palgrave MacMillan, pp.169-199.
- Organization for Economic Cooperation and Development (OECD) (2008) "Removing Barriers to SME access to International Markets."
- Petersen, M.A. And R.G. Rajan (1994) "The Benefits of Firm-creditor Relationship: Evidence from Small Business Data." *Journal of Finance*, 49(1), pp.3-37.
- Rumelt, R.P. (1984) "Towards a Strategic Theory of the Firm." In R.B. Lamb (ed.), *Competitive Strategic Management*. Englewood Cliffs, NJ: Prentice Hall, pp. 556-70.
- Sjoholm, F. and S. Takii (2003) "Foreign Networks and Exports: Results from Indonesian Panel Data." *ICSEAD Working Paper Series*, Vol. 2003-33, Kitakyushu: ICSEAD.
- Stiglitz, J.E. And A. Weiss (1981) "Credit Rationing in Markets with Imperfect Information." *American Economic Review*, 71 (3), pp.393-410.
- Wooldridge, Jeffrey M. (2002) *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: MIT Press.

Appendix 1. The ERIA Survey on SME Participation in Production Network

All Information is Confidential		<b>ERIA Survey on SME Participation in Production Networks**</b>																																								
(Country Code:.....)																																										
(Cambodia: CAM, China: CHN, Indonesia : IND, Malaysia: MLS, Laos: LAO, Philippines : PHL, Thailand: THA, Vietnam: VTN)																																										
General Information																																										
Q1. Name of Company																																										
Q2. Year of Establishment																																										
Q3. Type of Business	<input type="checkbox"/> 1. Garment <input type="checkbox"/> 2. Parts, Components, and Automotives (including motorbikes) <input type="checkbox"/> 3. Electrical, Electronic, parts and machinery <input type="checkbox"/> 4. Other, specify: .....																																									
Q4. Company size	Number of employees (persons) <input type="checkbox"/> 1. 1-5 persons <input type="checkbox"/> 3. 50-99 <input type="checkbox"/> 5. more than 200 <input type="checkbox"/> 2. 6-49 <input type="checkbox"/> 4. 100-199																																									
Q5. Company Status	What percentage of your firm is owned by Domestic .....% Foreign .....%    Nationality..... Government State .....% Joint-Venture .....%    Nationality.....																																									
Q6. Company Cost Structure	a) For Fiscal Year 2007 and 2008, please provide the following information about this establishment <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">2007</th> <th style="text-align: center;">2008</th> </tr> </thead> <tbody> <tr> <td>Total sales</td> <td style="text-align: right;">.....\$</td> <td style="text-align: right;">.....\$</td> </tr> <tr> <td>Profit</td> <td style="text-align: right;">.....%</td> <td style="text-align: right;">.....%</td> </tr> <tr> <td>Share of Cost of labor in total cost</td> <td style="text-align: right;">.....%</td> <td style="text-align: right;">.....%</td> </tr> <tr> <td>Share of cost of raw materials/intermediate goods used in total cost</td> <td style="text-align: right;">.....%</td> <td style="text-align: right;">.....%</td> </tr> <tr> <td>Share of Cost of electricity, fuel and water in total cost</td> <td style="text-align: right;">.....%</td> <td style="text-align: right;">.....%</td> </tr> <tr> <td>Share of interest payments (loan) in total cost</td> <td style="text-align: right;">.....%</td> <td style="text-align: right;">.....%</td> </tr> <tr> <td>Others</td> <td style="text-align: right;">.....%</td> <td style="text-align: right;">.....%</td> </tr> </tbody> </table> b) For fiscal year 2008, what is the total number and composition of employment in terms of education/training? <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Total</th> <th style="text-align: center;">% of female</th> </tr> </thead> <tbody> <tr> <td>.....persons</td> <td style="text-align: right;">.....%</td> <td style="text-align: right;">.....%</td> </tr> <tr> <td>With Tertiary education</td> <td style="text-align: right;">.....%</td> <td style="text-align: right;">.....%</td> </tr> <tr> <td>Vocational Training</td> <td style="text-align: right;">.....%</td> <td style="text-align: right;">.....%</td> </tr> <tr> <td>High school or less</td> <td style="text-align: right;">.....%</td> <td style="text-align: right;">.....%</td> </tr> </tbody> </table>				2007	2008	Total sales	.....\$	.....\$	Profit	.....%	.....%	Share of Cost of labor in total cost	.....%	.....%	Share of cost of raw materials/intermediate goods used in total cost	.....%	.....%	Share of Cost of electricity, fuel and water in total cost	.....%	.....%	Share of interest payments (loan) in total cost	.....%	.....%	Others	.....%	.....%		Total	% of female	.....persons	.....%	.....%	With Tertiary education	.....%	.....%	Vocational Training	.....%	.....%	High school or less	.....%	.....%
	2007	2008																																								
Total sales	.....\$	.....\$																																								
Profit	.....%	.....%																																								
Share of Cost of labor in total cost	.....%	.....%																																								
Share of cost of raw materials/intermediate goods used in total cost	.....%	.....%																																								
Share of Cost of electricity, fuel and water in total cost	.....%	.....%																																								
Share of interest payments (loan) in total cost	.....%	.....%																																								
Others	.....%	.....%																																								
	Total	% of female																																								
.....persons	.....%	.....%																																								
With Tertiary education	.....%	.....%																																								
Vocational Training	.....%	.....%																																								
High school or less	.....%	.....%																																								
Q7. Sources of Finance	a) Indicate source of your company finance <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">For : Total Working Capital</th> <th style="text-align: center;">Capital Expansion</th> </tr> </thead> <tbody> <tr> <td>Retained earnings</td> <td style="text-align: right;">.....%</td> <td style="text-align: right;">.....%</td> </tr> <tr> <td>Bank</td> <td style="text-align: right;">.....%</td> <td style="text-align: right;">.....%</td> </tr> <tr> <td>Other financial institutions</td> <td style="text-align: right;">.....%</td> <td style="text-align: right;">.....%</td> </tr> <tr> <td>Others ( <input type="checkbox"/> government concession/subsidized loan, <input type="checkbox"/> suppliers, <input type="checkbox"/> money lenders, <input type="checkbox"/> personal saving, and <input type="checkbox"/> relatives)</td> <td style="text-align: right;">.....%</td> <td style="text-align: right;">.....%</td> </tr> </tbody> </table> b) What is the average annual cost/rate of interest on borrowing?				For : Total Working Capital	Capital Expansion	Retained earnings	.....%	.....%	Bank	.....%	.....%	Other financial institutions	.....%	.....%	Others ( <input type="checkbox"/> government concession/subsidized loan, <input type="checkbox"/> suppliers, <input type="checkbox"/> money lenders, <input type="checkbox"/> personal saving, and <input type="checkbox"/> relatives)	.....%	.....%																								
	For : Total Working Capital	Capital Expansion																																								
Retained earnings	.....%	.....%																																								
Bank	.....%	.....%																																								
Other financial institutions	.....%	.....%																																								
Others ( <input type="checkbox"/> government concession/subsidized loan, <input type="checkbox"/> suppliers, <input type="checkbox"/> money lenders, <input type="checkbox"/> personal saving, and <input type="checkbox"/> relatives)	.....%	.....%																																								
Q8. Sources of Raw Materials/Intermediate inputs	What percentage of your firm's raw materials/intermediate inputs is sourced from a) Are they your ultimate buyers? b) How far are they from your plants? <table style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td>Other local SMEs</td> <td style="text-align: right;">.....%</td> <td><input type="checkbox"/> Yes <input type="checkbox"/> No</td> <td style="text-align: right;">.....Km, .....Hours</td> </tr> <tr> <td>Local large Firms</td> <td style="text-align: right;">.....%</td> <td><input type="checkbox"/> Yes <input type="checkbox"/> No</td> <td style="text-align: right;">.....Km, .....Hours</td> </tr> <tr> <td>Other domestic suppliers</td> <td style="text-align: right;">.....%</td> <td><input type="checkbox"/> Yes <input type="checkbox"/> No</td> <td style="text-align: right;">.....Km, .....Hours</td> </tr> <tr> <td>The rest from imports</td> <td style="text-align: right;">.....%</td> <td><input type="checkbox"/> Yes <input type="checkbox"/> No</td> <td style="text-align: right;">Countries: .....</td> </tr> </tbody> </table>			Other local SMEs	.....%	<input type="checkbox"/> Yes <input type="checkbox"/> No	.....Km, .....Hours	Local large Firms	.....%	<input type="checkbox"/> Yes <input type="checkbox"/> No	.....Km, .....Hours	Other domestic suppliers	.....%	<input type="checkbox"/> Yes <input type="checkbox"/> No	.....Km, .....Hours	The rest from imports	.....%	<input type="checkbox"/> Yes <input type="checkbox"/> No	Countries: .....																							
Other local SMEs	.....%	<input type="checkbox"/> Yes <input type="checkbox"/> No	.....Km, .....Hours																																							
Local large Firms	.....%	<input type="checkbox"/> Yes <input type="checkbox"/> No	.....Km, .....Hours																																							
Other domestic suppliers	.....%	<input type="checkbox"/> Yes <input type="checkbox"/> No	.....Km, .....Hours																																							
The rest from imports	.....%	<input type="checkbox"/> Yes <input type="checkbox"/> No	Countries: .....																																							
Q9. Sale patterns <i>(Please refer to the glossary for assistance with any unfamiliar terminology)</i>	a) What is the annual growth rate of your sales? <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">2007</th> <th style="text-align: center;">2008</th> </tr> </thead> <tbody> <tr> <td>.....%</td> <td style="text-align: right;">.....%</td> <td style="text-align: right;">.....%</td> </tr> </tbody> </table> b) Proportion of products sold: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">1) Size</th> <th style="text-align: center;">2) Distance from your plants</th> </tr> </thead> <tbody> <tr> <td>a) Domestic buyers .....%</td> <td></td> <td></td> </tr> <tr> <td>    of which: Final Assemblers .....%</td> <td style="text-align: center;"><input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> L</td> <td style="text-align: right;">.....Km, .....Hours</td> </tr> <tr> <td>                  First Tier .....%</td> <td style="text-align: center;"><input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> L</td> <td style="text-align: right;">.....Km, .....Hours</td> </tr> <tr> <td>                  Second Tier .....%</td> <td style="text-align: center;"><input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> L</td> <td style="text-align: right;">.....Km, .....Hours</td> </tr> <tr> <td>                  Third Tier and More .....%</td> <td style="text-align: center;"><input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> L</td> <td style="text-align: right;">.....Km, .....Hours</td> </tr> <tr> <td>                  Whole/Retailers .....%</td> <td style="text-align: center;"><input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> L</td> <td style="text-align: right;">.....Km, .....Hours</td> </tr> <tr> <td>b) Direct Exports .....%</td> <td colspan="2" style="text-align: right;">Countries: .....</td> </tr> </tbody> </table>				2007	2008	.....%	.....%	.....%		1) Size	2) Distance from your plants	a) Domestic buyers .....%			of which: Final Assemblers .....%	<input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> L	.....Km, .....Hours	First Tier .....%	<input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> L	.....Km, .....Hours	Second Tier .....%	<input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> L	.....Km, .....Hours	Third Tier and More .....%	<input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> L	.....Km, .....Hours	Whole/Retailers .....%	<input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> L	.....Km, .....Hours	b) Direct Exports .....%	Countries: .....										
	2007	2008																																								
.....%	.....%	.....%																																								
	1) Size	2) Distance from your plants																																								
a) Domestic buyers .....%																																										
of which: Final Assemblers .....%	<input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> L	.....Km, .....Hours																																								
First Tier .....%	<input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> L	.....Km, .....Hours																																								
Second Tier .....%	<input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> L	.....Km, .....Hours																																								
Third Tier and More .....%	<input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> L	.....Km, .....Hours																																								
Whole/Retailers .....%	<input type="checkbox"/> S <input type="checkbox"/> M <input type="checkbox"/> L	.....Km, .....Hours																																								
b) Direct Exports .....%	Countries: .....																																									
Q10. Location of plants	a) Distance from main ports (water/air) .....Km, .....Hours b) Distance from EPZ or Industrial Park <input type="checkbox"/> within <input type="checkbox"/> Outside.....Km, .....Hours																																									
Q11. Business Capability	a) Human resources development <ol style="list-style-type: none"> <li>Annual expense on staff training in the past 5 years .....US\$</li> </ol> b) Has your business made efforts for improving business processes or organizations in the past three years? <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Yes</th> <th style="text-align: center;">No</th> </tr> </thead> <tbody> <tr> <td>1. met an international standard (ISO or others)?</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>2. Introduced ICT (information and communication technologies) and reorganized business processes by it?</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>3. established new divisions or new plants?</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>4. attended/involved in business associations, cooperation with other firms, R&amp;D networks, trade fairs, etc.?</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </tbody> </table> c) Has your business operation adopted a new production method in the past three years? <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Yes</th> <th style="text-align: center;">No</th> </tr> </thead> <tbody> <tr> <td>1. Bought new machines or facilities with new functions to operation</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>2. Improved existing machines, equipment, or facilities</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>3. Introduced new know-how on production methods</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </tbody> </table>				Yes	No	1. met an international standard (ISO or others)?	<input type="checkbox"/>	<input type="checkbox"/>	2. Introduced ICT (information and communication technologies) and reorganized business processes by it?	<input type="checkbox"/>	<input type="checkbox"/>	3. established new divisions or new plants?	<input type="checkbox"/>	<input type="checkbox"/>	4. attended/involved in business associations, cooperation with other firms, R&D networks, trade fairs, etc.?	<input type="checkbox"/>	<input type="checkbox"/>		Yes	No	1. Bought new machines or facilities with new functions to operation	<input type="checkbox"/>	<input type="checkbox"/>	2. Improved existing machines, equipment, or facilities	<input type="checkbox"/>	<input type="checkbox"/>	3. Introduced new know-how on production methods	<input type="checkbox"/>	<input type="checkbox"/>												
	Yes	No																																								
1. met an international standard (ISO or others)?	<input type="checkbox"/>	<input type="checkbox"/>																																								
2. Introduced ICT (information and communication technologies) and reorganized business processes by it?	<input type="checkbox"/>	<input type="checkbox"/>																																								
3. established new divisions or new plants?	<input type="checkbox"/>	<input type="checkbox"/>																																								
4. attended/involved in business associations, cooperation with other firms, R&D networks, trade fairs, etc.?	<input type="checkbox"/>	<input type="checkbox"/>																																								
	Yes	No																																								
1. Bought new machines or facilities with new functions to operation	<input type="checkbox"/>	<input type="checkbox"/>																																								
2. Improved existing machines, equipment, or facilities	<input type="checkbox"/>	<input type="checkbox"/>																																								
3. Introduced new know-how on production methods	<input type="checkbox"/>	<input type="checkbox"/>																																								



<p>Q.11 continues...</p>	<p>d) Has your business introduced new products or services to the market in the past three years? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p style="padding-left: 40px;">if YES</p> <p style="padding-left: 40px;">to the existing market or new market? <input type="checkbox"/> Existing <input type="checkbox"/> New</p> <p style="padding-left: 40px;">by using the existing technologies or new technologies for your operation? <input type="checkbox"/> Existing <input type="checkbox"/> New</p> <p style="padding-left: 40px;">the average percentage increase in sales of new products in the past three years?.....%</p>																																																																										
<p>Q12. Assistance from Government, NGOs, and others</p>	<p>a) Have you received the following assistances?</p> <p>1) <b>Training</b> in general business management, entrepreneurship, and particular business skills such as marketing, accounting, and finance;</p> <p>2) <b>Counseling and advice</b>, often on a 'firm by firm' basis, and where particularly effective, as follow-up to training;</p> <p>3) <b>Technology development and transfer</b>, involving the adaptation, design and development of technologies and their dissemination to SMEs;</p> <p>4) <b>Market information</b> including complexity of production networks, buyers, technology, increasingly available through ICT-based facilities, as well through traditional mechanisms such as trade fairs, exhibitions, visits/tours;</p> <p>5) <b>Business linkages and networking</b> involving the development and strengthening of commercial linkages between SMEs and large firms (e.g. subcontracting) and among SMEs (e.g. development of 'enterprise clusters'), business associations;</p> <p>6) <b>Financing</b> aimed at channeling funds to SMEs either directly (e.g. special purpose financial institutions such as 'SME Banks') or indirectly (e.g. through special 'window' of commercial banks, perhaps at preferential rates);</p> <p>7) <b>Overall improvement in investment climate</b> (e.g. political and macroeconomic stability; laws, regulations, and dispute resolutions; reduce corruption and bureaucratic barriers; fair competition, infrastructure etc.); and</p> <p>8) <b>Others</b>, specify.....</p>	<table style="width:100%; border-collapse: collapse;"> <tr> <th style="width:10%;"></th> <th style="width:10%;">Yes</th> <th style="width:10%;">No</th> <th colspan="5"></th> </tr> <tr> <td style="border-top: 1px solid black;">1</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td colspan="5"></td> </tr> <tr> <td style="border-top: 1px solid black;">2</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">1 <input type="checkbox"/></td> <td style="text-align: center;">2 <input type="checkbox"/></td> <td style="text-align: center;">3 <input type="checkbox"/></td> <td style="text-align: center;">4 <input type="checkbox"/></td> <td style="text-align: center;">5 <input type="checkbox"/></td> </tr> <tr> <td style="border-top: 1px solid black;">3</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">1 <input type="checkbox"/></td> <td style="text-align: center;">2 <input type="checkbox"/></td> <td style="text-align: center;">3 <input type="checkbox"/></td> <td style="text-align: center;">4 <input type="checkbox"/></td> <td style="text-align: center;">5 <input type="checkbox"/></td> </tr> <tr> <td style="border-top: 1px solid black;">4</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">1 <input type="checkbox"/></td> <td style="text-align: center;">2 <input type="checkbox"/></td> <td style="text-align: center;">3 <input type="checkbox"/></td> <td style="text-align: center;">4 <input type="checkbox"/></td> <td style="text-align: center;">5 <input type="checkbox"/></td> </tr> <tr> <td style="border-top: 1px solid black;">5</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">1 <input type="checkbox"/></td> <td style="text-align: center;">2 <input type="checkbox"/></td> <td style="text-align: center;">3 <input type="checkbox"/></td> <td style="text-align: center;">4 <input type="checkbox"/></td> <td style="text-align: center;">5 <input type="checkbox"/></td> </tr> <tr> <td style="border-top: 1px solid black;">6</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">1 <input type="checkbox"/></td> <td style="text-align: center;">2 <input type="checkbox"/></td> <td style="text-align: center;">3 <input type="checkbox"/></td> <td style="text-align: center;">4 <input type="checkbox"/></td> <td style="text-align: center;">5 <input type="checkbox"/></td> </tr> <tr> <td style="border-top: 1px solid black;">7</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">1 <input type="checkbox"/></td> <td style="text-align: center;">2 <input type="checkbox"/></td> <td style="text-align: center;">3 <input type="checkbox"/></td> <td style="text-align: center;">4 <input type="checkbox"/></td> <td style="text-align: center;">5 <input type="checkbox"/></td> </tr> <tr> <td style="border-top: 1px solid black;">8</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">1 <input type="checkbox"/></td> <td style="text-align: center;">2 <input type="checkbox"/></td> <td style="text-align: center;">3 <input type="checkbox"/></td> <td style="text-align: center;">4 <input type="checkbox"/></td> <td style="text-align: center;">5 <input type="checkbox"/></td> </tr> </table>		Yes	No						1	<input type="checkbox"/>	<input type="checkbox"/>						2	<input type="checkbox"/>	<input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	3	<input type="checkbox"/>	<input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	4	<input type="checkbox"/>	<input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	5	<input type="checkbox"/>	<input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6	<input type="checkbox"/>	<input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	7	<input type="checkbox"/>	<input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8	<input type="checkbox"/>	<input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	<p>b) If Yes, are they adequate and/or effective? (1: very.....5: Not at all)</p> <p>1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p>
	Yes	No																																																																									
1	<input type="checkbox"/>	<input type="checkbox"/>																																																																									
2	<input type="checkbox"/>	<input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>																																																																				
3	<input type="checkbox"/>	<input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>																																																																				
4	<input type="checkbox"/>	<input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>																																																																				
5	<input type="checkbox"/>	<input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>																																																																				
6	<input type="checkbox"/>	<input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>																																																																				
7	<input type="checkbox"/>	<input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>																																																																				
8	<input type="checkbox"/>	<input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>																																																																				

<p><b>Perceptions of Barriers to SME Development</b></p>	
<p>Barriers to SME Development are defined as all those constraints that hinder a firm's ability to initiate, to develop, or to sustain business operations in both domestic and overseas markets.</p> <p>Q13. Thinking about your overall experience how significant a barrier to expanding your product or service are the following:</p> <p><i>(Please refer to the glossary for assistance with any unfamiliar terminology)</i></p>	<p><b>INTERNAL BARRIERS</b> - barriers internal to the enterprise associated with organizational resources/capabilities and company approach to business development.</p> <p style="padding-left: 40px;">Rank from: 1. Very significant ..... 5. Not significant</p> <p><b>INFORMATIONAL BARRIERS</b></p> <p><b>B1. Limited Information to locate/analyze markets/business partners</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B2. Unreliable market data (costs, prices, market shares)</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B3. Inability to identify and contact potential business partners</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>FUNCTIONAL BARRIERS</b></p> <p><b>B4. Lack of managerial time to identify new business opportunities</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B5. Insufficient quantity of and/or untrained personnel for market expansion</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B6. Lack of production capacity to expand</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B7. Shortage of working capital to finance new business plan</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B8. Difficulty in getting credit from suppliers and financial institutions</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>PRODUCT AND PRICE BARRIERS</b></p> <p><b>B9. Developing new products</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B10. Adapting to demanded product design/style</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B11. Meeting product quality/standards/specifications</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B12. Meeting packaging/labeling requirements</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B13. Offering technical/after-sales service</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B14. Offering competitive prices to customers</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B15. Difficulty in matching competitors' prices</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B16. Anti-competitive or informal practices</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p>

	<p><b>DISTRIBUTION, LOGISTICS AND PROMOTION BARRIERS</b></p> <p><b>B17. Complexity of production value chain</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B18. Accessing a new production chain</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B19. Establishing and maintaining trust with business partners</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B20. Unavailability of inventories/warehousing facilities</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p>
	<p><b>B21. Excessive transportation/insurance costs</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B22. Participation in promotional activities to target markets/business partners</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p>
	<p><b>EXTERNAL BARRIERS</b> - barriers stemming from the home and foreign/target/host environment, within which the firm operates.</p> <p><b>PROCEDURAL BARRIERS</b></p> <p><b>B23. Unfamiliarity with complexity of procedures/paperwork</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B24. Difficulties in enforcing contracts and resolving disputes</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B25. Lack of home government assistance/incentives</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B26. Unfavourable home rules and regulations</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B27. Unfavourable host/foreign rules and regulations</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>BUSINESS ENVIRONMENT BARRIERS</b></p> <p><b>B28. Poor/deteriorating economic conditions</b></p> <p>a) Home Market 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p>b) Foreign Market 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B29. Inadequacy of basic and IT infrastructure</b></p> <p>a) Home Market 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p>b) Foreign Market 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B30. Political instability</b></p> <p>a) Home Market 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p>b) Foreign Market 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>TAX, TARIFF AND NON-TARIFF BARRIERS</b></p> <p><b>B31. High tax and tariff barriers</b></p> <p>a) Home Market 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p>b) Foreign Market 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B32. Inadequate property rights protection (e.g. intellectual property)</b></p> <p>a) Home Market 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p>b) Foreign Market 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements)</b></p> <p>a) Home Market 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p>b) Foreign Market 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B34. High costs of Customs administration, in exporting or importing</b></p> <p>a) Home Market 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p>b) Foreign Market 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>OTHER BARRIERS</b></p> <p><b>B35. Perceived risks in your current and new business operations</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B36. Lack of the perceived benefits from joining production networks</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B37. Willingness to adopt new business strategy or ideas</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p> <p><b>B38. Others, please specify.....</b> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/></p>
Q14. Selecting from the barriers by main category above, what do you consider to be the most important barriers to the operation of your firm? (please rank 1: highest..... 8:lowest)	<input type="checkbox"/> INFORMATIONAL BARRIERS <input type="checkbox"/> FUNCTIONAL BARRIERS <input type="checkbox"/> PRODUCT AND PRICE BARRIERS <input type="checkbox"/> DISTRIBUTION, LOGISTICS AND PROMOTION BARRIERS <input type="checkbox"/> PROCEDURAL BARRIERS <input type="checkbox"/> BUSINESS ENVIRONMENT BARRIERS <input type="checkbox"/> TAX, TARIFF AND NON-TARIFF BARRIERS <input type="checkbox"/> OTHER BARRIERS

<b>Perceptions of assistance to SMEs</b>	<input type="checkbox"/>
Q15. What sort of assistance would be most effective to you in overcoming the barriers you faced in the conduct of your business (please rank the degree of importance 1: highest to 8:lowest)	<input type="checkbox"/> <b>Training</b> in general business management, entrepreneurship, and particular business skills such as marketing, accounting, and finance; <input type="checkbox"/> <b>Counseling and advice</b> , often on a 'firm by firm' basis, and where particularly effective, as follow-up to training; <input type="checkbox"/> <b>Technology development and transfer</b> , involving the adaptation, design and development of technologies and their dissemination to SMEs; <input type="checkbox"/> <b>Information</b> on market including complexity of production networks, buyers, technology, increasingly available through ICT-based facilities, as well through traditional mechanisms such as trade fairs, exhibitions, visits/tours; <input type="checkbox"/> <b>Business linkages and networkings</b> involving the development and strengthening of commercial linkages between SMEs and large firms (e.g. subcontracting) and among SMEs (e.g. development of 'enterprise clusters'), business associations; <input type="checkbox"/> <b>Financing</b> aimed at channeling funds to SMEs either directly (e.g. special purpose financial institutions such as SME Banks') or indirectly (e.g. through special 'window' of commercial banks, perhaps at preferential rates; <input type="checkbox"/> <b>Overall improvement in investment climate</b> (e.g. political and macroeconomic stability; laws, regulations, and dispute resolutions; reduce corruption and bureaucratic barriers; fair competition, infrastructure etc.); and <input type="checkbox"/> <b>Others</b> , specify..... ..... .....

\*\*Large part of this questionnaire is adapted from OECD (2008) "Removing Barriers to SME Access to International Markets".

THANK YOU VERY MUCH FOR YOUR COOPERATION

# Notes for Interviewers

## Brief points of guidance for the interview:

- a) It is the face-to-face type of questionnaire survey;
- b) Interviewers should be familiar with all the terminology;
- c) Sample size must be at least 100 firms;
- d) For Q3 of the questionnaire, the distribution of sample size for each business sector should reflect the share of the sector in the total country's manufacturing output.

## Glossary

**Production Value Chain:** refers to the full range of *value-added activities* required to bring a product from its conception, through design, sourcing raw materials and intermediate inputs, production, marketing, distribution and support to final consumers.

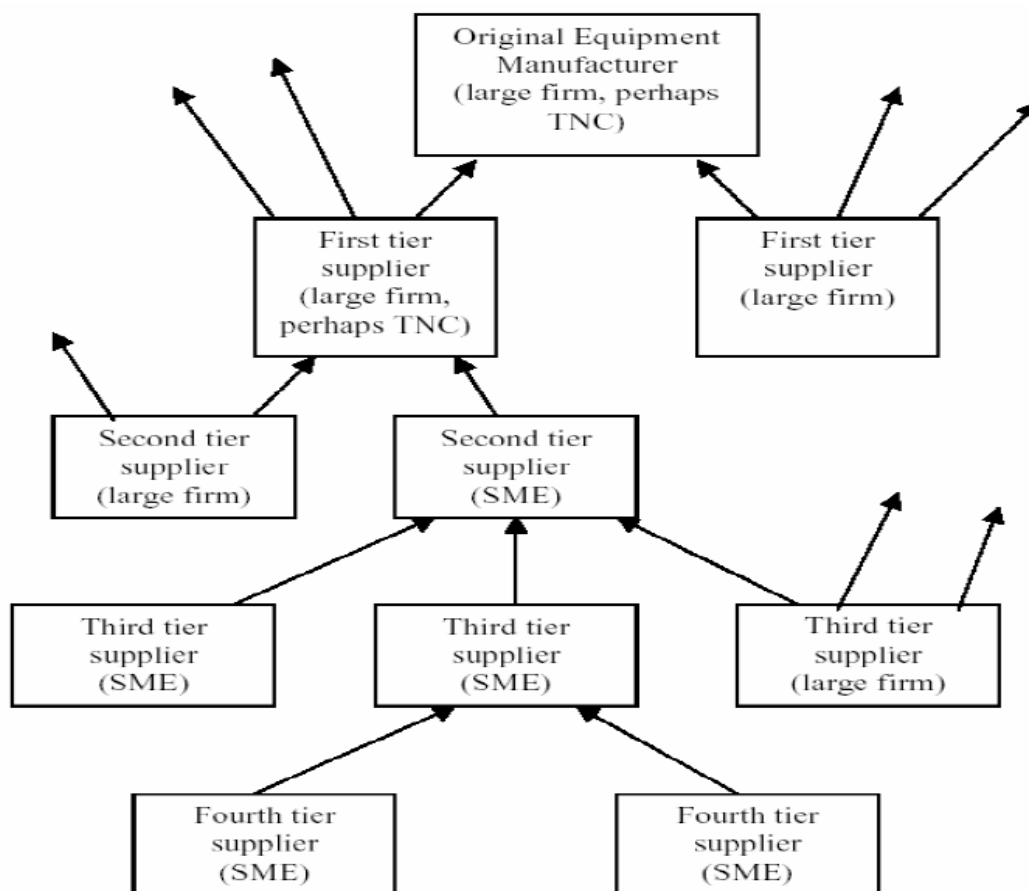
**Final Assemblers:** are lead firms, original equipment manufacturers (such as Toyota, Sony, Levi, Carrefour...).

**First Tier:** are normally large-firm wholesalers or global suppliers who are surrounded by lower-tier suppliers.

**Second Tier:** can be large-firm or SME suppliers of parts, components, and other inputs to the next higher-tier

**Third and More Tier:** are lower-end in the production networks, value chains, predominantly SMEs doing low-skill, low-value added activities, producing relatively simple outputs, and competing on the basis of low cost, with

## Illustration of the tiers of firms:



Source: Abonyi (2005)

**INTERNAL BARRIERS:** Barriers internal to the enterprise associated with organizational resources/capabilities

**Informational Barriers:** problems in identifying, selecting, and contacting potential markets due to information inefficiencies.

**(B1) Limited information to locate/analyze markets/business partners:** difficulty in knowing what national and international sources of information is available or required to reduce the level of uncertainty.

**(B2) Unreliable market data (costs, prices, market shares):** problems associated with the source, quality, and comparability of available information used to attempt to increase understanding of markets (including access to data, ability to retrieve data quickly, and the cost of obtaining data).

**(B3) Inability to Identify and contact potential business partners:** difficulty in strategically and/or proactively identifying and selecting opportunities in foreign markets (including customers, contacts, business partners and joint ventures).

**FUNCTIONAL BARRIERS:** inefficiencies of various functions internal to the enterprises such as human resources, production, and finance.

**(B4) Lack of managerial time devoted to new business opportunities:** inability of managers to devote sufficient time, resources and energy towards selecting, entering and expanding into new markets, designing marketing strategies, and conducting business.

**(B5) Insufficient quantity of and/or untrained personnel for market expansion:** problems associated with insufficient numbers of personnel to handle the excess work demanded by new operations, in addition to a lack of specialized knowledge and expertise within the company to deal with new business opportunities.

**(B6) Lack of production capacity to expand:** an inexistence of or inability to generate production to expand business operations.

**(B7) Shortage of working capital to finance new business plan:** difficulty in allocating and/or justifying adequate expenditure towards researching markets, adapting marketing strategies and/or inability to access financing assistance from governmental agencies, banks and other investors.

**(B8) Difficulty in getting credit from suppliers and financial institutions:** problems due to lack of trust to receive credit from suppliers, and lack of collateral to access to credit from financial institutions.

**PRODUCT AND PRICE BARRIERS:** pressures imposed by external forces on adapting the elements of the company's marketing strategy including barriers associated with the company's product, pricing, distribution, logistics, and promotional activities both domestic and overseas.

**(B9) Developing new products:** inability, difficulty or unwillingness to develop entirely new products to changing specific market needs and wants.

**(B10) Adapting demanded product design/style:** inability, difficulty or unwillingness to adapt the company's product design or style to the idiosyncrasies of each market (*e.g.* different conditions of use, variations in purchasing power, dissimilar consumer tastes, diverse socio-cultural settings).

**(B11) Meeting product quality/standards/specifications:** inability, difficulty, or unwillingness to adapt products necessitated by both legal and non-legal differences in quality standards and preferences among markets.

**(B12) Meeting packaging/labeling requirements:** inability, difficulty or unwillingness to adapt: packaging for requirements such as safety during transportation, storage and handling; and/or labeling for requirements such as different languages, specific information required by the host country (such as expiry dates, types of ingredients and net weight), and symbols, pictures, and colours preferred by foreign markets.

**(B13) Offering technical/after-sales service:** problems associated with the provision of technical and/or after-sales service including delays and increased costs associated with: geographical distances between the company and its market; setting up servicing operations in strategic locations; maintaining large quantities of spare parts; adjusting the approach to after-sales service for variations in conditions of use, competitive practices, and physical

**(B14) Offering competitive prices to customers:** inability to offer customers competitive prices because of: higher unit costs due to small production runs; additional costs incurred in modifying product, packaging and/or service; higher administrative, operational and transportation expenses; extra taxes, tariffs, and fees imposed; and higher costs of marketing and distribution.

**(B15) Difficulty in matching competitors' prices:** lack of price competitiveness due to factors that are controllable (*e.g.* strict adoption of a cost-plus pricing method) and/or uncontrollable (*e.g.* differences among countries' cost structure of production, distribution, and logistics; adoption of dumping practices by competitors; and government policy to subsidies local industry).

**(B16) Anti-competition or informal practices:** problems due to monopoly or entry-barriers, smuggling and other unfair competitive behavior

**(B17) Complexity of production value chain:** problems associated with adjusting production methods according to the variations and idiosyncrasies within each production chain (*e.g.* range and quality of services offered, and number of layers of a production chain).

**(B18) Accessing production chain:** problems associated with gaining access to production chain (including production that is occupied by the competition; the costs of managing the length of the production; or various levels of the system being controlled by a certain producer).

**(B19) Establishing and maintaining trust between business partners:** difficulties in obtaining and maintaining reliable business partners who meet the: structural (territorial coverage, financial strength, physical facilities), operational (product assortment, logistical arrangements, warehouse facilities), and behavioral (market reputation, relationships with government, co-operative attitude) requirements of the partner and is not already engaged by a

**(B20) Unavailability of inventories/warehousing facilities:** problems associated with finding/building adequate warehousing including lack of proper installations to safeguard product quality, prohibitive storage fees, outdated warehousing equipment technology, and the need for a multiple warehousing system.

**(B21) Excessive transportation/insurance costs:** the exacerbation of transportation costs because of large distances to and within markets, poor infrastructural facilities, limited availability of transportation, and delays in product delivery; and/or insurance costs because of the higher risks associated with selling goods.

**(B22) Participation in promotional activities to target markets/business partners:** problems associated with adjusting promotional activities due to variations in buying motives, consumption patterns, and government regulations including: variations in the composition of the target audience, inappropriate content of the advertising message, unavailability or different use of advertising media, restrictions in the frequency/duration of advertising, and insufficient means to assess advertising effectiveness across markets.

**EXTERNAL BARRIERS:** Barriers stemming from the home and host environment within which the firm

**Procedural Barriers:** barriers associated with the operating aspects of transactions with foreign customers.

**(B23) Unfamiliarity with complexity of procedures/paperwork:** difficulty in understanding and/or managing customs documentation, shipping arrangements, and other procedures.

**(B24) Difficulties in enforcing contracts and resolving disputes:** problems associated with: enforcing contracts due to poor quality (*e.g.* non-verifiable information, ambiguity, lack of consideration or mutual acceptance, and/or unreasonable breadth of the contract); enforcing contracts because of unclear expectations, misinterpretation, "bad faith" and/or unwillingness of contract partner(s) to uphold the contract; resolving disputes because of nonexistent or unsophisticated dispute resolution mechanisms, time and/or cost of accessing foreign legal systems, lack of knowledge of laws, and conflicts of laws; and/or unwillingness of contract partner(s) to participate in dispute

**GOVERNMENTAL BARRIERS:** Barriers associated with the actions or inaction by the home government in relation to its indigenous companies and exporters.

**(B25) Lack of home government assistance/incentives:** support and/or encouragement by government agencies to SMEs.

**(B26) Unfavourable home rules and regulations:** local producers are restricted by controls imposed by the home government including restrictions on exports of either components or final-products to certain hostile countries and/or restrictions on products with national security or foreign policy significance.

**(B27) Unfavourable host/foreign rules and regulations:** local producers are restricted by controls imposed by the host government including restrictions on exports of either components or final-products to certain hostile countries and/or restrictions on products with national security or foreign policy significance.

**BUSINESS ENVIRONMENT BARRIERS:** Barriers associated with the economic, political-legal and socio-cultural environment of the market(s) within which the company operates or is planning to operate.

**(B28) Poor/deteriorating economic conditions:** unpredictable consumer behavior caused by economic effects such as large foreign debts, high inflation rates, and high unemployment levels in markets, which erode their citizens' purchasing power and impacts on their spending habits (*e.g.* seeking more economical products, purchasing goods less often, and carefully selecting what they buy).

**(B29) Inadequacy of basic and IT infrastructure:** poor roads, ports, and logistic supporting facilities, high utility costs, non-existent or unsophisticated IT infrastructures (*e.g.* hardware, software, security, and broadband) are in place to support the distribution, sale, purchase, marketing, and servicing of products or services over electronic systems such as the Internet and other computer networks.

**(B30) Political instability:** difficulty in initiating or maintaining operations due to economic (low household incomes, inflationary trends, large foreign debt), societal (crime, theft, disorder, religious fundamentalism, ethnic tension, high degree of corruption), and/or political (authoritarian regime, conflict with neighbours, military

**TAX, TARIFF AND NON-TARIFF BARRIERS:** Barriers associated with restrictions on importing or exporting, and internationalizing imposed by government policies and regulations in home or foreign markets.

**(B31) High tax and tariff barriers:** the burden associated with excessive tax applied to imported goods to artificially inflate prices of imports and protect domestic industries from foreign competition.

**(B32) Inadequate property rights protection (e.g. intellectual property):** difficulties associated with an inadequate legal framework to protect the ownership, use, control, benefit, transferral or sale of both physical and intangible property especially intellectual property (*e.g.* copyrights, patents, trademarks and trade secrets).

**(B33) Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements):** difficulties associated with meeting high, non-transparent, inconsistent and/or discriminatory country-specific standards for imported goods including: sanitary and phytosanitary requirements; industrial and environmental protection standards; conformity assessment procedures (testing and re-testing, verification, inspection and certification to confirm products fulfill standards); and technical standards (*e.g.* preparation, adoption and application of different standards for specific characteristics of a product such as production, design, functions and

**(B34) High costs of Customs administration, in exporting or importing:** costs associated with, divergent interpretations of customs valuation rules by different Customs administrations (including the use of arbitrary or fictitious customs values); delay in customs clearance procedures (*e.g.* excessive and/or irrelevant paperwork, congestion at points of entry, delay and cost of cargo clearance); lack of procedures for prompt review; and lack of transparency and/or irregular/illegal practices (*e.g.* unofficial customs procedures, unwritten rules and unpublished changes, unofficial fees to accelerate processing, and the absence of information on customs regulations and

**(B35) Perceived risks in your current and new business operations:** the willingness to take risks by owners/managers reflecting the attitude towards and assessment of risks.

**(B36) Lack of the perceived benefits from joining production networks:** reflecting the inability to perceive benefits by owners/managers.

**(B37) Willingness to adopt new business strategy or ideas:** reflecting how well owners/managers are opened to new initiatives/ideas to improve their business.

## **Appendix 2. List of Constraints and their Category**

---

### **INFORMATIONAL BARRIERS**

---

- B1. Limited Information to locate/analyze markets/business partners
  - B2. Unreliable market data (costs, prices, market shares)
  - B3. Inability to indentify and contact potential business partners
- 

### **FUNCTIONAL BARRIERS**

---

- B4. Lack of managerial time to identify new business opportunities
  - B5. Insufficient quantity of and/or untrained personnel for market expansion
  - B6. Lack of production capacity to expand
  - B7. Shortage of working capital to finance new business plan
  - B8. Difficulty in getting credit from suppliers and financial institutions
- 

### **PRODUCT AND PRICE BARRIERS**

---

- B9. Developing new products
  - B10. Adapting to demanded product design/style
  - B11. Meeting product quality/standards/specifications
  - B12. Meeting packaging/labeling requirements
  - B13. Offering technical/after-sales service
  - B14. Offering competitive prices to customers
  - B15. Difficulty in matching competitors' prices
  - B16. Anti-competitive or informal practices
- 

### **DISTRIBUTION, LOGISTICS AND PROMOTION BARRIERS**

---

- B17. Complexity of production value chain
  - B18. Accessing a new production chain
  - B19. Establishing and maintaining trust with business partners
  - B20. Unavailability of inventories/warehousing facilities
  - B21. Excessive transportation/insurance costs
  - B22. Participation in promotional activities to target markets/business partners
- 

### **PROCEDURAL BARRIERS**

---

- B23. Unfamiliarity with complexity of procedures/paperwork
  - B24. Difficulties in enforcing contracts and resolving disputes
  - B25. Lack of home government assistance/incentives
  - B26. Unfavorable home rules and regulations
  - B27. Unfavorable host/foreign rules and regulations
- 

### **BUSINESS ENVIRONMENT BARRIERS**

---

- B28. Poor/deteriorating economic conditions (home)
  - B28. Poor/deteriorating economic conditions (foreign)
  - B29. Inadequacy of basic and IT infrastructure (home)
  - B29. Inadequacy of basic and IT infrastructure (foreign)
  - B30. Political instability (home)
  - B30. Political instability (foreign)
- 

### **TAX, TARIFF AND NON-TARIFF BARRIERS**

---

- B31. High tax and tariff barriers (home)
- B31. High tax and tariff barriers (foreign)
- B32. Inadequate property rights protection (*e.g.* intellectual property)- (home)
- B32. Inadequate property rights protection (*e.g.* intellectual property) - (foreign)



B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) -  
(home)

---

B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) -  
(foreign)

B34. High costs of Customs administration, in exporting or importing (home)

B34. High costs of Customs administration, in exporting or importing (foreign)

---

**OTHER BARRIERS**

---

B35. Perceived risks in your current and new business operations

B36. Lack of the perceived benefits from joining production networks

B37. Willingness to adopt new business strategy or ideas

---

---

*Source:* OECD (2008)

### Appendix 3. Complete Ranking of Perception of Barriers for SMEs – Whole Sample

Barrier	Obs	Mean	S.D.	Rank
B14. Offering competitive prices to customers	796	2.72	1.25	1
B35. Perceived risks in your current and new business operations	796	2.75	1.33	2
B28. Poor/deteriorating economic conditions (home)	741	2.78	1.26	3
B19. Establishing and maintaining trust with business partners	796	2.79	1.27	4
B1. Limited Information to locate/analyze markets/business partners	793	2.79	1.27	5
B31. High tax and tariff barriers (home)	795	2.81	1.24	6
B30. Political instability (home)	796	2.82	1.20	7
B15. Difficulty in matching competitors' prices	794	2.88	1.32	8
B6. Lack of production capacity to expand	794	2.90	1.34	9
B2. Unreliable market data (costs, prices, market shares)	792	2.90	1.33	10
B4. Lack of managerial time to identify new business opportunities	796	2.93	1.28	11
B21. Excessive transportation/insurance costs	791	2.95	1.26	12
B34. High costs of Customs administration, in exporting or importing (home)	795	2.97	1.30	13
B7. Shortage of working capital to finance new business plan	758	3.02	1.29	14
B37. Willingness to adopt new business strategy or ideas	789	3.04	1.27	15
B3. Inability to indentify and contact potential business partners	757	3.04	1.44	16
B9. Developing new products	794	3.06	1.24	17
B32. Inadequate property rights protection (e.g. intellectual property)- (home)	791	3.09	1.24	18
B25. Lack of home government assistance/incentives	780	3.10	2.26	19
B5. Insufficient quantity of and/or untrained personnel for market expansion	791	3.12	1.30	20
B11. Meeting product quality/standards/specifications	793	3.12	1.33	21
B18. Accessing a new production chain	795	3.12	1.29	22
B10. Adapting to demanded product design/style	791	3.13	1.40	23
B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) - (home)	791	3.14	1.27	24
B29. Inadequacy of basic and IT infrastructure (home)	791	3.15	1.25	25
B36. Lack of the perceived benefits from joining production networks	682	3.16	1.38	26
B13. Offering technical/after-sales service	794	3.19	1.27	27
B20. Unavailability of inventories/warehousing facilities	757	3.21	1.42	28
B16. Anti-competitive or informal practices	793	3.21	1.94	29
B30. Political instability (foreign)	758	3.22	1.37	30
B8. Difficulty in getting credit from suppliers and financial institutions	791	3.22	1.25	31
B22. Participation in promotional activities to target markets/business partners	743	3.22	1.22	32
B17. Complexity of production value chain	778	3.27	1.33	33
B26. Unfavorable home rules and regulations	794	3.31	1.88	34
B28. Poor/deteriorating economic conditions (foreign)	778	3.34	1.24	35
B32. Inadequate property rights protection (e.g. intellectual property) - (foreign)	778	3.34	1.30	36
B24. Difficulties in enforcing contracts and resolving disputes	719	3.37	1.52	37
B29. Inadequacy of basic and IT infrastructure (foreign)	704	3.38	1.45	38
B31. High tax and tariff barriers (foreign)	721	3.42	1.48	39
B12. Meeting packaging/labeling requirements	746	3.43	1.45	40

B34. High costs of Customs administration, in exporting or importing (foreign)	715	3.49	1.42	41
B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) - (foreign)	647	3.51	1.50	42
B23. Unfamiliarity with complexity of procedures/paperwork	718	3.51	1.49	43
B27. Unfavorable host/foreign rules and regulations	720	3.53	1.52	44

#### **Appendix 4. Complete Ranking of Perception of Barriers for SMEs in Production Network**

Barrier	Obs	Mean	S.D.	Rank
B14. Offering competitive prices to customers	248	2.50	1.20	1
B35. Perceived risks in your current and new business operations	245	2.51	1.19	2
B28. Poor/deteriorating economic conditions (home)	231	2.57	1.20	3
B19. Establishing and maintaining trust with business partners	247	2.57	1.29	4
B1. Limited Information to locate/analyze markets/business partners	247	2.62	1.29	5
B31. High tax and tariff barriers (home)	231	2.64	1.31	6
B30. Political instability (home)	230	2.67	1.48	7
B15. Difficulty in matching competitors' prices	247	2.67	1.23	8
B6. Lack of production capacity to expand	247	2.68	1.30	9
B2. Unreliable market data (costs, prices, market shares)	248	2.69	1.23	10
B4. Lack of managerial time to identify new business opportunities	247	2.70	1.30	11
B21. Excessive transportation/insurance costs	245	2.71	1.30	12
B34. High costs of Customs administration, in exporting or importing (home)	219	2.76	1.37	13
B7. Shortage of working capital to finance new business plan	247	2.77	1.32	14
B37. Willingness to adopt new business strategy or ideas	244	2.78	1.26	15
B3. Inability to identify and contact potential business partners	247	2.79	1.35	16
B9. Developing new products	247	2.80	1.27	17
B32. Inadequate property rights protection (e.g. intellectual property)- (home)	232	2.81	1.49	18
B25. Lack of home government assistance/incentives	247	2.84	1.32	19
B5. Insufficient quantity of and/or untrained personnel for market expansion	248	2.85	1.27	20
B11. Meeting product quality/standards/specifications	247	2.88	1.33	21
B18. Accessing a new production chain	245	2.89	1.29	22
B10. Adapting to demanded product design/style	247	2.89	1.38	23
B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) - (home)	232	2.93	1.44	24
B29. Inadequacy of basic and IT infrastructure (home)	230	2.93	1.26	25
B36. Lack of the perceived benefits from joining production networks	245	2.94	1.30	26
B13. Offering technical/after-sales service	245	2.95	1.38	27
B20. Unavailability of inventories/warehousing facilities	246	2.96	1.48	28
B16. Anti-competitive or informal practices	245	2.97	1.38	29
B30. Political instability (foreign)	231	2.99	1.59	30
B8. Difficulty in getting credit from suppliers and financial institutions	247	2.99	1.36	31
B22. Participation in promotional activities to target markets/business partners	247	3.00	1.26	32
B17. Complexity of production value chain	247	3.01	1.27	33
B26. Unfavorable home rules and regulations	246	3.03	1.36	34
B28. Poor/deteriorating economic conditions (foreign)	230	3.04	1.49	35
B32. Inadequate property rights protection (e.g. intellectual property) - (foreign)	231	3.05	1.60	36

B24. Difficulties in enforcing contracts and resolving disputes	246	3.05	1.37	37
B29. Inadequacy of basic and IT infrastructure (foreign)	230	3.07	1.47	38
B31. High tax and tariff barriers (foreign)	231	3.09	1.55	39
B12. Meeting packaging/labeling requirements	246	3.10	1.37	40
B34. High costs of Customs administration, in exporting or importing (foreign)	218	3.11	1.53	41
B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary	231	3.15	1.60	42
B23. Unfamiliarity with complexity of procedures/paperwork	246	3.20	1.29	43
B27. Unfavorable host/foreign rules and regulations	246	3.24	1.47	44

### Appendix 5. Complete Ranking of Perception of Barriers for SMEs Out of Production Network

Barrier	Obs	Mean	S.D.	Rank
B7. Shortage of working capital to finance new business plan	549	2.74	1.34	1
B14. Offering competitive prices to customers	548	2.82	1.26	2
B6. Lack of production capacity to expand	549	2.84	1.25	3
B2. Unreliable market data (costs, prices, market shares)	547	2.87	1.24	4
B1. Limited Information to locate/analyze markets/business partners	546	2.87	1.25	5
B28. Poor/deteriorating economic conditions (home)	510	2.88	1.27	6
B15. Difficulty in matching competitors' prices	549	2.88	1.19	7
B3. Inability to identify and contact potential business partners	547	2.93	1.30	8
B8. Difficulty in getting credit from suppliers and financial institutions	548	2.96	1.27	9
B5. Insufficient quantity of and/or untrained personnel for market expansion	548	2.97	1.28	10
B4. Lack of managerial time to identify new business opportunities	545	2.99	1.33	11
B19. Establishing and maintaining trust with business partners	547	3.04	1.33	12
B35. Perceived risks in your current and new business operations	546	3.15	1.24	13
B9. Developing new products	547	3.18	1.21	14
B31. High tax and tariff barriers (home)	527	3.18	1.24	15
B21. Excessive transportation/insurance costs	544	3.19	1.23	16
B13. Offering technical/after-sales service	548	3.20	1.30	17
B20. Unavailability of inventories/warehousing facilities	545	3.21	1.36	18
B30. Political instability (home)	527	3.21	1.39	19
B25. Lack of home government assistance/incentives	533	3.22	2.58	20
B11. Meeting product quality/standards/specifications	544	3.22	1.27	21
B22. Participation in promotional activities to target markets/business partners	544	3.22	1.24	22
B10. Adapting to demanded product design/style	548	3.22	1.24	23
B37. Willingness to adopt new business strategy or ideas	547	3.24	1.21	24
B18. Accessing a new production chain	546	3.25	1.25	25
B17. Complexity of production value chain	547	3.27	1.26	26
B16. Anti-competitive or informal practices	548	3.32	2.14	27
B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) - (home)	526	3.34	1.32	28
B36. Lack of the perceived benefits from joining production networks	546	3.34	1.20	29
B34. High costs of Customs administration, in exporting or importing (home)	463	3.35	1.35	30
B29. Inadequacy of basic and IT infrastructure (home)	513	3.35	1.19	31
B32. Inadequate property rights protection (e.g. intellectual property)- (home)	525	3.38	1.36	32

B26. Unfavorable home rules and regulations	532	3.38	1.31	33
B23. Unfamiliarity with complexity of procedures/paperwork	532	3.40	1.21	34
B12. Meeting packaging/labeling requirements	548	3.41	2.06	35
B24. Difficulties in enforcing contracts and resolving disputes	532	3.48	1.24	36
B27. Unfavorable host/foreign rules and regulations	500	3.52	1.43	37
B28. Poor/deteriorating economic conditions (foreign)	474	3.55	1.41	38
B30. Political instability (foreign)	488	3.55	1.45	39
B31. High tax and tariff barriers (foreign)	490	3.58	1.41	40
B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) - (foreign)	487	3.69	1.41	41
B29. Inadequacy of basic and IT infrastructure (foreign)	485	3.69	1.35	42
B34. High costs of Customs administration, in exporting or importing (foreign)	429	3.71	1.44	43
B32. Inadequate property rights protection (e.g. intellectual property) - (foreign)	489	3.75	1.42	44

## Appendix 6. Complete Ranking of Perception of Barriers for SMEs in Low Quality Production Network

Barrier	Obs	Mean	S.D.	Rank
B35. Perceived risks in your current and new business operations	152	2.49	1.14	1
B14. Offering competitive prices to customers	154	2.51	1.21	2
B19. Establishing and maintaining trust with business partners	153	2.61	1.25	3
B6. Lack of production capacity to expand	154	2.68	1.31	4
B1. Limited Information to locate/analyze markets/business partners	154	2.68	1.31	5
B28. Poor/deteriorating economic conditions (home)	149	2.70	1.15	6
B15. Difficulty in matching competitors' prices	154	2.71	1.24	7
B21. Excessive transportation/insurance costs	153	2.73	1.28	8
B2. Unreliable market data (costs, prices, market shares)	154	2.73	1.24	9
B4. Lack of managerial time to identify new business opportunities	154	2.75	1.29	10
B31. High tax and tariff barriers (home)	148	2.77	1.27	11
B7. Shortage of working capital to finance new business plan	154	2.79	1.39	12
B34. High costs of Customs administration, in exporting or importing (home)	140	2.80	1.34	13
B3. Inability to indentify and contact potential business partners	154	2.84	1.34	14
B30. Political instability (home)	148	2.86	1.49	15
B37. Willingness to adopt new business strategy or ideas	151	2.92	1.24	16
B32. Inadequate property rights protection (e.g. intellectual property)- (home)	149	2.93	1.46	17
B5. Insufficient quantity of and/or untrained personnel for market expansion	154	2.95	1.22	18
B10. Adapting to demanded product design/style	154	2.96	1.37	19
B9. Developing new products	154	2.97	1.27	20
B18. Accessing a new production chain	152	2.98	1.30	21
B25. Lack of home government assistance/incentives	153	3.00	1.33	22
B11. Meeting product quality/standards/specifications	154	3.01	1.31	23
B36. Lack of the perceived benefits from joining production networks	152	3.02	1.30	24
B13. Offering technical/after-sales service	153	3.03	1.40	25
B20. Unavailability of inventories/warehousing facilities	153	3.05	1.47	26
B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) - (home)	149	3.09	1.40	27
B22. Participation in promotional activities to target markets/business partners	153	3.10	1.27	28
B17. Complexity of production value chain	153	3.10	1.23	29
B30. Political instability (foreign)	149	3.13	1.65	30
B26. Unfavorable home rules and regulations	153	3.14	1.32	31
B29. Inadequacy of basic and IT infrastructure (home)	148	3.15	1.24	32
B28. Poor/deteriorating economic conditions (foreign)	148	3.16	1.52	33
B16. Anti-competitive or informal practices	153	3.16	1.38	34
B24. Difficulties in enforcing contracts and resolving disputes	153	3.17	1.35	35
B29. Inadequacy of basic and IT infrastructure (foreign)	148	3.18	1.52	36
B34. High costs of Customs administration, in exporting or importing (foreign)	139	3.18	1.57	37
B8. Difficulty in getting credit from suppliers and financial institutions	154	3.18	1.35	38
B32. Inadequate property rights protection (e.g. intellectual property) - (foreign)	148	3.24	1.58	39
B23. Unfamiliarity with complexity of procedures/paperwork	153	3.26	1.27	40
B12. Meeting packaging/labeling requirements	153	3.28	1.35	41
B31. High tax and tariff barriers (foreign)	148	3.32	1.56	42
B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) - (foreign)	148	3.33	1.59	43
B27. Unfavorable host/foreign rules and regulations	153	3.43	1.45	44

## Appendix 7. Complete Ranking of Perception of Barriers for SMEs in High Quality Production Network

Barrier	Obs	Mean	S.D.	Rank
B30. Political instability (home)	82	2.32	1.41	1
B28. Poor/deteriorating economic conditions (home)	82	2.33	1.25	2
B31. High tax and tariff barriers (home)	83	2.40	1.36	3
B14. Offering competitive prices to customers	94	2.50	1.21	4
B19. Establishing and maintaining trust with business partners	94	2.50	1.34	5
B1. Limited Information to locate/analyze markets/business partners	93	2.51	1.26	6
B9. Developing new products	93	2.52	1.25	7
B29. Inadequacy of basic and IT infrastructure (home)	82	2.54	1.20	8
B35. Perceived risks in your current and new business operations	93	2.55	1.27	9
B37. Willingness to adopt new business strategy or ideas	93	2.55	1.26	10
B25. Lack of home government assistance/incentives	94	2.57	1.27	11
B32. Inadequate property rights protection (e.g. intellectual property)- (home)	83	2.60	1.52	12
B4. Lack of managerial time to identify new business opportunities	93	2.61	1.31	13
B15. Difficulty in matching competitors' prices	93	2.61	1.23	14
B2. Unreliable market data (costs, prices, market shares)	94	2.63	1.23	15
B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) - (home)	83	2.64	1.48	16
B16. Anti-competitive or informal practices	92	2.64	1.31	17
B21. Excessive transportation/insurance costs	92	2.66	1.34	18
B31. High tax and tariff barriers (foreign)	83	2.67	1.45	19
B8. Difficulty in getting credit from suppliers and financial institutions	93	2.68	1.30	20
B11. Meeting product quality/standards/specifications	93	2.68	1.35	21
B34. High costs of Customs administration, in exporting or importing (home)	79	2.68	1.43	22
B5. Insufficient quantity of and/or untrained personnel for market expansion	94	2.69	1.34	23
B3. Inability to identify and contact potential business partners	93	2.70	1.36	24
B6. Lack of production capacity to expand	93	2.70	1.30	25
B32. Inadequate property rights protection (e.g. intellectual property) - (foreign)	83	2.71	1.60	26
B30. Political instability (foreign)	82	2.73	1.44	27
B7. Shortage of working capital to finance new business plan	93	2.75	1.21	28
B18. Accessing a new production chain	93	2.75	1.26	29
B10. Adapting to demanded product design/style	93	2.78	1.41	30
B12. Meeting packaging/labeling requirements	93	2.80	1.35	31
B20. Unavailability of inventories/warehousing facilities	93	2.81	1.49	32
B36. Lack of the perceived benefits from joining production networks	93	2.81	1.30	33
B13. Offering technical/after-sales service	92	2.82	1.34	34
B28. Poor/deteriorating economic conditions (foreign)	82	2.82	1.42	35
B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) - (foreign)	83	2.83	1.57	36
B24. Difficulties in enforcing contracts and resolving disputes	93	2.85	1.39	37
B26. Unfavorable home rules and regulations	93	2.85	1.41	38
B17. Complexity of production value chain	94	2.85	1.34	39
B22. Participation in promotional activities to target markets/business partners	94	2.85	1.24	40
B29. Inadequacy of basic and IT infrastructure (foreign)	82	2.87	1.36	41
B27. Unfavorable host/foreign rules and regulations	93	2.94	1.47	42
B34. High costs of Customs administration, in exporting or importing (foreign)	79	2.99	1.45	43
B23. Unfamiliarity with complexity of procedures/paperwork	93	3.09	1.32	44

### Appendix 8. Ranked Constraints by Category Faced by SMEs

All Sample					In Production Network					Out Production Network				
Barrier	Obs	Mean	S.D.	Rank	Barrier	Obs	Mean	S.D.	Rank	Barrier	Obs	Mean	S.D.	Rank
Product and Price Barriers	788	2.96	1.71	1	Product and Price Barriers	247	2.95	1.76	1	Product and Price Barriers	541	2.96	1.68	1
Functional Barriers	788	3.76	1.90	2	Functional Barriers	247	3.84	1.92	2	Functional Barriers	541	3.72	1.90	2
Business Environment Barriers	787	3.96	1.94	3	Business Environment Barriers	247	3.91	2.07	3	Business Environment Barriers	540	3.99	1.88	3
Informational Barriers	785	4.27	2.10	4	Distribution, Logistics and Promotion Barriers	247	4.34	1.84	4	Informational Barriers	538	4.04	2.08	4
Distribution, Logistics and Promotion Barriers	785	4.32	1.77	5	Procedural Barriers	247	4.36	2.04	5	Distribution, Logistics and Promotion Barriers	538	4.30	1.74	5
Procedural Barriers	785	4.54	1.90	6	Tax, Tariff and Non-Tariff Barriers	247	4.53	2.26	6	Procedural Barriers	538	4.62	1.83	6
Tax, Tariff and Non-Tariff Barriers	786	4.89	2.17	7	Informational Barriers	247	4.77	2.05	7	Tax, Tariff and Non-Tariff Barriers	539	5.06	2.11	7
Other Barriers	765	7.30	1.64	8	Other Barriers	243	7.30	1.73	8	Other Barriers	522	7.30	1.60	8

### Appendix 9. Ranked Constraints by Category Faced by SMEs and Quality in Production Network

Low Quality Production Network					High Quality Production Network				
Barrier	Obs	Mean	S.D.	Rank	Barrier	Obs	Mean	S.D.	Rank
Product and Price Barriers	153	2.90	1.72	1	Product and Price Barriers	94	3.03	1.82	1
Business Environment Barriers	153	3.75	2.00	2	Functional Barriers	94	3.62	1.91	2
Functional Barriers	153	3.98	1.92	3	Business Environment Barriers	94	4.17	2.16	3
Procedural Barriers	153	4.38	2.02	4	Distribution, Logistics and Promotion Barriers	94	4.26	1.68	4
Distribution, Logistics and Promotion Barriers	153	4.40	1.93	5	Procedural Barriers	94	4.33	2.08	5
Tax, Tariff and Non-Tariff Barriers	153	4.46	2.19	6	Tax, Tariff and Non-Tariff Barriers	94	4.65	2.38	6
Informational Barriers	153	4.69	2.12	7	Informational Barriers	94	4.88	1.96	7
Other Barriers	150	7.41	1.56	8	Other Barriers	93	7.13	1.97	8



### Appendix 10. Ranked Effectiveness of the Assistance to the Surveyed SMEs

All Sample					In Production Network					Out Production Network				
Assistance	Obs	Mean	S.D.	Rank	Assistance	Obs	Mean	S.D.	Rank	Assistance	Obs	Mean	S.D.	Rank
Financing	175	0.32	0.47	1	Technology development and transfer	75	0.30	0.46	1	Financing	175	0.32	0.47	1
Technology development and transfer	191	0.35	0.48	2	Financing	77	0.31	0.46	2	Technology development and transfer	191	0.35	0.48	2
Counseling and advice	197	0.36	0.48	3	Counseling and advice	89	0.36	0.48	3	Counseling and advice	197	0.36	0.48	3
Overall improvement in investment climate	206	0.38	0.49	4	Overall improvement in investment climate	91	0.37	0.48	4	Overall improvement in investment climate	206	0.38	0.49	4
Business linkages and networking	214	0.39	0.49	5	Training	101	0.41	0.49	5	Business linkages and networking	214	0.39	0.49	5
Training	227	0.41	0.49	6	Business linkages and networking	107	0.43	0.50	6	Training	227	0.41	0.49	6
Information	261	0.48	0.50	7	Information	120	0.48	0.50	7	Information	261	0.48	0.50	7

### Appendix 11. Ranked Effectiveness of the Assistance to the Surveyed SMEs by Quality in Production Network

Low Quality Production Network					High Quality Production Network				
Assistance	Obs	Mean	S.D.	Rank	Assistance	Obs	Mean	S.D.	Rank
Financing	86	1.13	1.39	1	Financing	53	1.64	1.53	1
Overall improvement in investment climate	97	1.21	1.42	2	Technology development and transfer	51	1.80	1.71	2
Technology development and transfer	87	1.23	1.56	3	Business linkages and networking	59	1.90	1.55	3
Business linkages and networking	108	1.40	1.56	4	Training	61	1.90	1.46	4
Information	114	1.46	1.51	5	Overall improvement in investment climate	56	1.91	1.64	5
Counseling and advice	88	1.49	1.45	6	Information	62	2.18	1.56	6
Training	91	1.52	1.52	7	Counseling and advice	47	2.28	1.69	7

### Appendix 12. Ranked Perception of the Assistance by the Surveyed SMEs

All Sample					In Production Network					Out Production Network				
Assistance	Obs	Mean	S.D.	Rank	Assistance	Obs	Mean	S.D.	Rank	Assistance	Obs	Mean	S.D.	Rank
Financing	175	0.32	0.47	1	Technology development and transfer	75	0.30	0.46	1	Financing	175	0.32	0.47	1
Technology development and transfer	191	0.35	0.48	2	Financing	77	0.31	0.46	2	Technology development and transfer	191	0.35	0.48	2
Counseling and advice	197	0.36	0.48	3	Counseling and advice	89	0.36	0.48	3	Counseling and advice	197	0.36	0.48	3
Overall improvement in investment climate	206	0.38	0.49	4	Overall improvement in investment climate	91	0.37	0.48	4	Overall improvement in investment climate	206	0.38	0.49	4
Business linkages and networking	214	0.39	0.49	5	Training	101	0.41	0.49	5	Business linkages and networking	214	0.39	0.49	5
Training	227	0.41	0.49	6	Business linkages and networking	107	0.43	0.50	6	Training	227	0.41	0.49	6
Information	261	0.48	0.50	7	Information	120	0.48	0.50	7	Information	261	0.48	0.50	7

### Appendix 13. Ranked Perception of the Assistance by the Surveyed SMEs and Quality in Production Network

Low Quality Production Network					High Quality Production Network				
Assistance	Obs	Mean	S.D.	Rank	Assistance	Obs	Mean	S.D.	Rank
Overall improvement in investment climate	150	3.45	2.27	1	Overall improvement in investment climate	90	3.73	2.37	1
Financing	150	3.57	2.05	2	Business linkages and networking	90	3.76	1.87	2
Information	150	3.87	1.82	3	Financing	90	3.80	2.28	3
Business linkages and networking	150	3.88	2.00	4	Training	90	3.94	2.09	4
Training	150	4.33	1.95	5	Information	90	4.09	1.86	5
Counseling and advice	150	4.53	1.84	6	Technology development and transfer	90	4.16	1.70	6
Technology development and transfer	150	4.64	1.88	7	Counseling and advice	90	4.69	1.78	7

## CHAPTER 5

# Constraints on SMEs in Cambodia and their Participation in Production Networks

**Chheang Vannarith,**

Cambodia Institute for Cooperation and Peace (CICP), Cambodia

**Sothea Oum,**

Economic Research Institute for ASEAN and East Asia (ERIA), Indonesia.

**Leng Thearith**

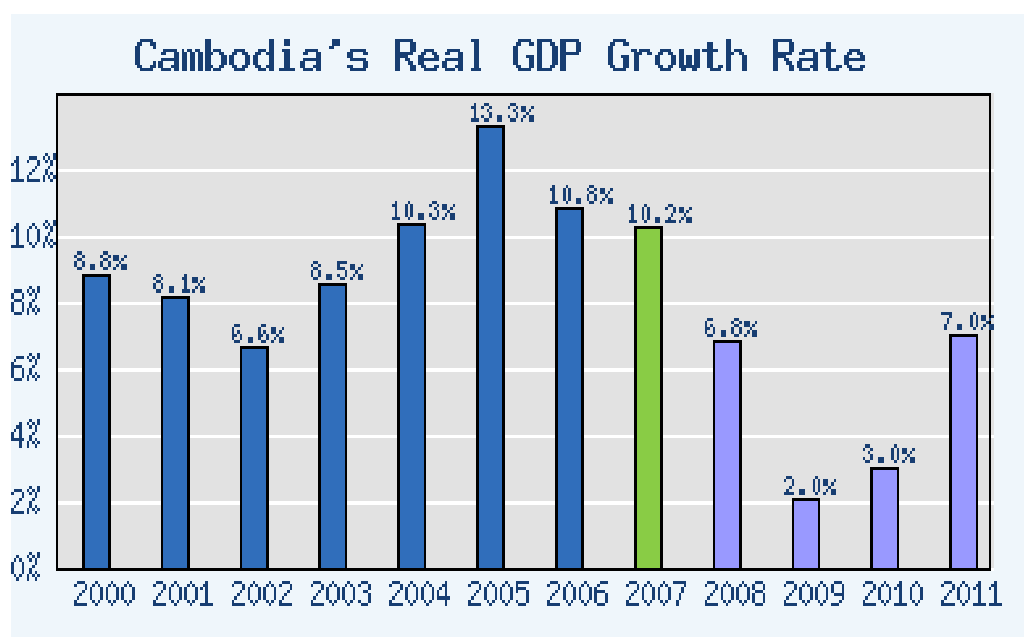
Cambodia Institute for Cooperation and Peace (CICP), Cambodia

*SMEs have played a significant role in Cambodian economic development, especially in the context of the global economic crisis. Regional integration in Southeast and East Asia has created both opportunities and challenges for Cambodia's SMEs. Their limited capacity for business expansion and integration in production networks restrain Cambodia SMEs from making use of regional integration. There are certain different characteristics for those SMEs that participate in production networks from those which do not, such as their higher productivity, business capability and innovation. Most surveyed SMEs are operating under severe internal constraints. Though SMEs receive some assistance, they still need support in the fields of "Business linkages and networking" and "Financing". Since access to financing is consistently viewed as one of the biggest constraints faced by SMEs, specialized SME banks, which are very common in the region, should be established, or a loan or mortgage guarantee from the government as practiced in Indonesia should be considered. An SME Development Fund and SME Business Development Services (BDS) could be another option to iron out these constraints.*

## 1. Introduction

The Cambodian economy has strongly integrated itself within the regional and global economies after it became a full member of ASEAN in 1999 and the WTO (World Trade Organization) in 2004. Regionalization and globalization have assisted Cambodian economic development through export led growth in economic structure and tourism services. The Cambodian economy has performed well in the last decade in which the real annual GDP growth was at an average of 9.5 percent. However, the global economic crisis has contracted the Cambodian economy in all sectors at different levels. The most affected industries are the textile and tourism industries.

**Figure 1**



Source: Ministry of Economy and Finance, <http://www.mef.gov.kh/>.

The global economic crisis has had an adverse impact on the Cambodian economy since the end of 2008. The GDP contracted to 6.8 percent in 2008 and was estimated to plunge further to 2 percent in 2009. The international institutions estimated that Cambodian GDP growth could be lower than the government's calculation. The International Monetary Fund (IMF), for instance, predicted - 2.75% growth, World Bank forecasted - 1% growth, and the Economic Intelligence Unit estimated -3% growths in 2009, (UNDP, 2009). Although there

are differences or gaps in estimating the drop in GDP, there are significant clues which lead us to believe that the Cambodian economy is facing huge challenges ahead.

The garment sector, which accounts for approximately 12 percent of GDP, is the main income generator for Cambodian labor forces. The sector employs 4 percent of the Cambodian labor force of whom 90 percent are women. The remittances from factory workers help to reduce poverty in rural areas. Textile exports account for 72 percent of Cambodia's total merchandise exports. The sector has been strongly affected by the global economic downturn due to the fact that approximately 90 percent of investment capital comes from overseas and the main textiles markets are the United States and Europe. The garment export market grew only 2 percent in 2008 and is expected to decline in 2009 and 2010. According to forecasts made by the Asian Development Bank (ADB) and the IMF, the garment industry will fall to -5% in 2009. In the first five months of 2009, garment exports dropped 27 per cent. As result of the global economic crisis and lack of demand, 50 factories were closed. Consequently, approximately 60, 000 of 400, 000 garment workers have lost their jobs since September 2008, World Bank (2010).

**Table 1. Markets for Cambodian Garments**

Market	Value in 2007 (US\$'000)	Share of total in 2007 (%)	Value in 2008 (US\$'000)	Share of total in 2008 (%)
Total	1,899	100	2,001	100
USA	1,359	72	1,405	70
EU	391	21	404.5	20
Canada	100.5	5	130.6	6.5
Japan	7	0.4	7.9	0.4
Rest of world	42.6	2	53.09	2.7

*Source:* Ministry of Commerce

Short term contracts (normally less than three months) have been used by the factory owners and managers to deal with the fluctuating and decreasing demand since the crisis took place. This management policy has adversely impacted on the livelihoods of the workers. The decrease in production resulted in less working and overtime hours and also caused the average wage of the workers to decline further. After suspending and closing their operations, many of the factory employers were no longer responsible for the laid-off employees.

Agriculture, which contributes about 32 percent of GDP is also faced with some challenges due to low growth forecasts. In 2009, the estimated growth is 5-6% (by ADB) and 1.5% by the IMF. The impact of this has been felt mainly in the form of lower prices and revenues. Agricultural production is expanding but the price is decreasing. These impacts on the family incomes of farmers due to increased costs of agricultural commodities and materials used for farming, such as, fertilizers, fuels and labor, and the low price of their harvested products and limited markets. In addition, the production of industrial crops is decreasing due to the decreasing material demand from factories.

The tourism sector is faced with difficulties given that the number of international tourist arrivals to Cambodia has dropped below expectation. In 2008, Cambodia received only 2.1 million tourists; 2.3% lower than the target set by the Royal Government. In 2009, it is estimated that the industry will drop to -2% (forecast by ADB) and -6% (forecast made by IMF). The number of entrance tickets sold at the Angkor Temple complex dropped remarkably in early 2009. In the first three months of 2009, the number had dropped to -22.38 percent compared with the same period in the previous year. Several hotels and restaurants were closed down in Siem Reap town.

The construction sector, which contributes 7 percent of GDP, has been shrinking due to the lack of investment and also due to construction projects that were suspended. It is estimated that in 2009 the sector will have negative growth: -1.5% (by ADB) and -2% (by IMF). The price of real estate has decreased continuously since the end of 2008.

Overall, Cambodia's economic performance had been going quite smoothly during the last decade except in 2009 in which the global financial and economic crisis reduced Cambodian growth to the lowest level it had ever experienced during the last 15 years.

The current economic situation places more emphasis on the role of Small and Medium Enterprises (SME)s in sustainable economic development. Even during an economic crisis, SMEs can operate normally with less impact from the crisis than is experienced by larger firms. Moreover, the SMEs are confronted with increasing challenges resulting from East Asian regionalism, especially fierce competition from stronger industries of other ASEAN member countries such as, China, Japan, and South Korea. It also vividly reflects the lack of export capacity of Cambodian SMEs to the region. Therefore, it has become necessary for the Royal Government of Cambodia and Cambodia's SMEs to identify the constraints which they have been facing so as to minimize undesirable outcomes of East Asian regional integration and find ways to benefit from the integration through promoting exports.

To achieve this end, this report will shed light on the current situation of SMEs in Cambodia (definitions and characteristics), the existing literature on the subject will be referred to in order to construct a conceptual framework and to allow space for academic contributions, and ultimately examine the challenges and constraints faced by SMEs. Several ways to assist SMEs to integrate into the regional production networks and markets will be determined.

## **2. Literature Review on SME studies in Cambodia**

SMEs play a crucial role in the economic development of Cambodia. Even so, research related to SMEs is limited, especially research concerning the constraints with which the SMEs are faced in the context of regionalism. For instance, Shariff and Peou (2008) did their research on a subject related to SMEs in Cambodia, but the study focused only on the relationship between entrepreneurial values, firm financing and management, and the growth performance of SMEs. Specifically, the research concluded that the growth performance of the SMEs is subject to the ability of entrepreneurs in creating and aligning the company. Harner (2003) also conducted his own study on SMEs in Cambodia. However, his research is limited to the barriers that prevent SMEs from receiving financial assistance from the banks. Harner identified six constraints which the banks in Cambodia face and which therefore cause difficulties in lending money to SMEs (1) perception that the current legal system of Cambodia is not able to protect the interests of the banks; (2) high funding costs; (3) the lack of access by the banks to long-term capital; (4) inability to track information on loan applicants; (5) the need to meet the National Bank of Cambodia's high liquidity ratio; and (6) lack of ability to assess, and manage, risks pertaining to term loans.

In addition to the research done by Shariff, Peou, and Harner, Meas Wat Ho (2006) directed his research onto the role of Cambodia's SMEs in the private sector, and the economic development following the government's adoption of an economic liberalization policy in the early 1990s, which concludes that the labor intensive nature of SMEs helps to shift the structure of employment in the rural areas. The study also suggested that the products of SMEs could not compete in international markets due to their low quality. While this research, one way or another, attempted to identify the challenges that Cambodia's SMEs

face, due to the opening of its markets, the examples chosen in the studies were limited to rice milling SMEs only.

Baily (2007) also did a study of Cambodia’s SMEs in an attempt to discover the major constraints which the domestic SMEs face, and identified three barriers to SME development in Cambodia. These are the weak regulatory and legal framework of the government, limited SME access to finance, and a shortage of SME-supporting activities. This paper will fill the gap caused by the limitation of past research in the field of SMEs, especially research which attempts to discover the constraints viewed from a regional integration perspective.

### 3. General Characteristics of Cambodia’s SMEs

As of March 2009, there were 376,761 enterprises in Cambodia 93% of which were small and Medium Enterprises.<sup>1</sup> According to a survey conducted by the National Institute of Statistics (NIS) in 2000, almost 80% of Cambodian SMEs were engaged in the food, beverages, and tobacco sectors.<sup>2</sup> 13% of the SMEs were small-scale garment and textile, machinery, and non-metallic operations, and 7% were furniture manufacturers. Noticeably, the data from the Ministry of Industry, Mines, and Energy of Cambodia in 2005 also gave a similar result. Specifically, slightly more than 80% of Cambodian SMEs were involved in food, beverages and tobacco as shown in Table 1 below:

**Table 2. Characteristics of SMEs in Cambodia**

Enterprises Types	2000	2001	2002	2003	2004	2005
Food, beverages and tobacco	20,152	21,871	21,568	20,869	22,712	23,343
Textile wearing apparel leather	366	2,382	1,417	1,406	1,672	1,662
Wood Products including furniture	869	141	13	13	16	-
Paper products printing publishing	24	23	15	21	25	31
Chemicals petroleum coal plastics	297	277	275	96	120	153
Non-metallic mineral products	666	721	757	681	680	718
Fabricated metal products	1,824	1,454	1,899	1,850	2,239	2,222
Other manufacturing	1,208	1,286	976	1,049	667	618
Total	25,406	28,155	26,920	25,985	28,131	28,747

<sup>1</sup> Visal, “Cambodia has more than 300,000 Enterprises and More Than 1.4 Million Workers,” *The Raksmei Kampuchia*, Vol.17, Issue. 5070, December 11<sup>th</sup>, 2009.

<sup>2</sup> Baily, Peter, “Cambodian Small and Medium Sized Enterprises: Constraints, Policies, Proposals for Their Development,” ERIA Research Report, 2007, [http://www.eria.org/research/images/pdf/PDF%20No.5/No,5-1-Cambodian.pdf] (accessed 15 November 2009)



Source: Cambodian Ministry of Industry Mines and Energy, Cambodian National Institute of Statistics Yearbook 2006.

#### 4. Definition of SMEs and the Survey Sample

The definition of Small and Medium Enterprises varies from one country to another because of differences in the size of capital, labor forces, and contexts of countries.

For Cambodia, before 2005, the definition of SMEs varied. For instance, the National Institute of Statistics (NIS) stated that enterprises could be considered as small when the number of employees was less than 10. When the number was 11 or more, they would be regarded as large. Further, SMEs that employed between 11 and 100 employees would be classed as medium.<sup>3</sup> In contrast, the Ministry of Industry, Mines, and Energy held the opinion that small enterprises were those with less than 50 staff members.

In order to avoid double standards in the definition of SMEs, the Government of Cambodia SME Sub-committee, in July 2005, suggested that enterprises be classified as follows:

**Table 3. Definitions of SMEs in Cambodia**

	Number of Employees	Financial Determined by Assets excluding land (USD)
Micro	Less than 11	50,000
Small	11-50	50,000-250,000
Medium	51-100	250,000-500,000
Large	Over 100	Over 500,000

Source: Royal Government of Cambodia Sub-committee on SMEs (2005).

For data collection in this study, standard questionnaires were distributed to the representatives of SMEs in Phnom Penh, the capital city of Cambodia. The data collection had two phases: first we invited about 60 SMEs to attend a workshop on SMEs and East Asian Regional Integration held on October 5, 2009 with presentations made by experts in the field of SMEs and Regional Integration. During the workshop, the participants received explanations about the objectives of the research, some concepts regarding the roles of SMEs

<sup>3</sup> Baily, Peter, "Cambodian Small and Medium Sized Enterprises: Constraints, Policies, Proposals for Their Development," ERIA Research Report, 2007, [<http://www.eria.org/research/images/pdf/PDF%20No.5/No,5-1-Cambodian.pdf>] (accessed 15 November 2009)

and regional integration in East Asia, and the challenges and opportunities deriving from regional integration. In addition to the explanation and clarifications, the questionnaires were distributed to the participants. As a result, 51 questionnaires were completed. For the second phase of data collection, face-to-face interviews were carried out at the SME locations, by three research assistants. Another 60 SMEs were chosen randomly for the second phase of data collection.

In total, there were 111 completed questionnaires. For the purpose of this study, the definition of SMEs is different from the standard definition of the Cambodian government. SMEs here are those that employ not more than 200 employees. In this survey, the firms with more than 200 workers are dropped from the sample, and there are 99 SMEs remaining as presented in Table 4. Most of the sample SMEs has staff numbers from 6 to 49, which accounts for 90% of the total SMEs. It means that SMEs in Cambodia are relatively small in terms of their staffing. 14% of the sampled SMEs are in the Garments sector, 20% in Parts, Components, and automotive products, and the rest are “Others”.

**Table 4. Sample of the Surveyed SMEs by Type and Size**

Type	Number of Employees				Total	% of Total
	1 – 5	6 - 49	50 - 99	100 - 199		
Garments	1	13	0	0	14	14.1%
Automotive Parts, and Components,	1	19	0	0	20	20.2%
Others	3	57	2	3	65	65.7%
Total	5	89	2	3	99	
% of Total	5.05%	89.90%	2.02%	3.03%		100%

*Source:* ERIA – SME Survey 2009.

## 5. Analysis of the Survey Results

### 5.1. Characteristics of the Surveyed SMEs

Table 5 shows a summary of the surveyed SMEs. The average ages of the SMEs are 5.4 years for garments, 6.3 for automotive parts and components, and 9.3 for others. Most SMEs in the sample are domestically owned, accounting for 99% of the total. Only one SME, in the “others” category, is foreign-owned.

The average sales growth in 2007 was about 12% for all industries, but the growth in 2008 slowed down, reflecting a lower GDP growth compared with 2007. For both 2007 and

2008, most SMEs reported a profit of about 20%. Only 1 SME in the survey reported exporting about 20% of its products abroad. All the rest sell their products domestically.

Raw materials/intermediate input is the biggest part of the sampled firms' cost, accounting for more than 60% of total cost, followed by other costs, averaging about 13% for garments, 12% for automotive parts and components, and 18% for others. The share of labor cost averages about 16% for garments, 9% for automotive parts and components, and 12% for others. Utilities cost averages of about 10% for garments, 7% for automotive parts and components, and 9% for others. Only one SME in the Garment industry reported an interest payment (of about 10% of total cost), and 10 SMEs in others paid an average of 6.4% of total cost.

**Table 5. Characteristics of the Surveyed SMEs**

Characteristics	Garments			Automotive parts and components			Others		
	N	Mean	S.D	N	Mean	S.D	N	Mean	S.D
Age (year)	14	5.4	1.6	20	6.3	3.3	65	9.3	5.0
Ownership (%)									
Domestic	14	100.0	0.0	20	100.0	0.0	64	99.8	1.3
Foreign	0	.	.	0	.	.	1	100.0	.
Sales (% growth)									
2007	14	12.3	3.5	20	11.3	2.7	63	12.9	8.2
2008	14	-0.8	19.2	20	-1.2	16.4	65	-2.9	20.2
Profit (%)									
2007	13	23.2	9.0	20	19.3	5.6	64	20.5	8.6
2008	13	23.5	9.7	20	19.0	6.7	64	19.5	8.3
Cost Structure 2008 (%)									
Labor	14	15.8	4.2	20	9.2	3.1	65	12.3	4.4
Raw Materials	14	60.1	4.0	20	71.7	7.7	65	59.9	7.4
Utilities	14	10.4	3.2	20	7.4	2.0	65	8.9	5.4
Interest	1	10.0	.	0	.	.	10	6.4	3.5
Other costs	14	13.1	6.5	20	11.8	6.9	65	17.9	8.9
Employees by Education (%)									
Tertiary	0	.	.	5	24.0	26.1	37	19.5	9.9
Vocational	14	92.9	4.7	20	69.3	19.6	65	57.8	18.0
High school or less	11	9.1	3.0	17	30.9	12.0	61	33.4	16.6
Source of Working Capital (%)									
Retained Earning	14	45.4	13.7	19	27.1	14.7	65	37.0	15.7
Bank	1	40.0	.	1	20.0	.	12	20.4	13.2
Other Financial Institutions	0	.	.	0	.	.	3	36.7	37.9
Others	14	51.8	12.0	20	73.3	14.4	64	58.5	15.0
Average Cost of Borrowing (%)	1	10.0	.	0	.	.	12	7.8	2.9
Sale Destination (%)									
Domestic	14	100.0	0.0	20	100.0	0.0	65	99.7	2.5
Export	0	.	.	0	.	.	1	20.0	.

Source: ERIA – SMEs Survey 2009.

In terms of the education level of the employees, the majority of the workers within the garment sector have some vocational training as well as high school or lesser education. For SMEs in automotive parts and components, 24% of their employees have a tertiary education,

and for the others category, 19% possess a tertiary education, while the rest of their employees have some vocational training as well as a high school or lesser education.

The surveyed SMEs reported that internal financing is the main source of their financing. The majority of their working capital finance comes from retained earnings and other sources (e.g. family). Out of the total 99 SMEs, 17 reported borrowing from banks and other financial institutions for their working capital.

## 5.2. Business Capability and Innovation of the Surveyed SMEs

When asked questions which reflected their business capability and innovation performance in the past 3 years, none of the SMEs in garments and automotive parts and components have met international standards (e.g. ISO) compared with about 23% of SMEs in others. There are no SMEs in garments and only 2 in automotive parts and components that have applied information and communication technology (ICT) compared with about 63% in others. About half of the SMEs in garments, and automotive parts and components, participate in business networks and trade fairs, compared with 94% in others.

**Table 6. Business Capability and Innovation of the Surveyed SMEs**

Business Capability and Innovation	Garments		Automotive parts and components		Others	
	N	% of total	N	% of total	N	% of total
Meeting international standards (ISO)	0	0.0	0	0.0	15	23.1
Introducing ICT	0	0.0	2	10.0	41	63.1
Establishing new divisions or plant	1	7.1	7	35.0	15	23.1
Participation in business network, trade fairs	7	50.0	10	50.0	61	93.8
New machines or facilities	13	92.9	19	95.0	42	64.6
Improving existing machines	14	100.0	19	95.0	57	87.7
Introducing new ideas	12	85.7	7	35.0	58	89.2
Introducing new products into new markets	3	21.4	5	25.0	46	70.8
Introducing new products using new technology	2	14.3	3	15.0	43	66.2

Source: ERIA – SMEs Survey 2009.

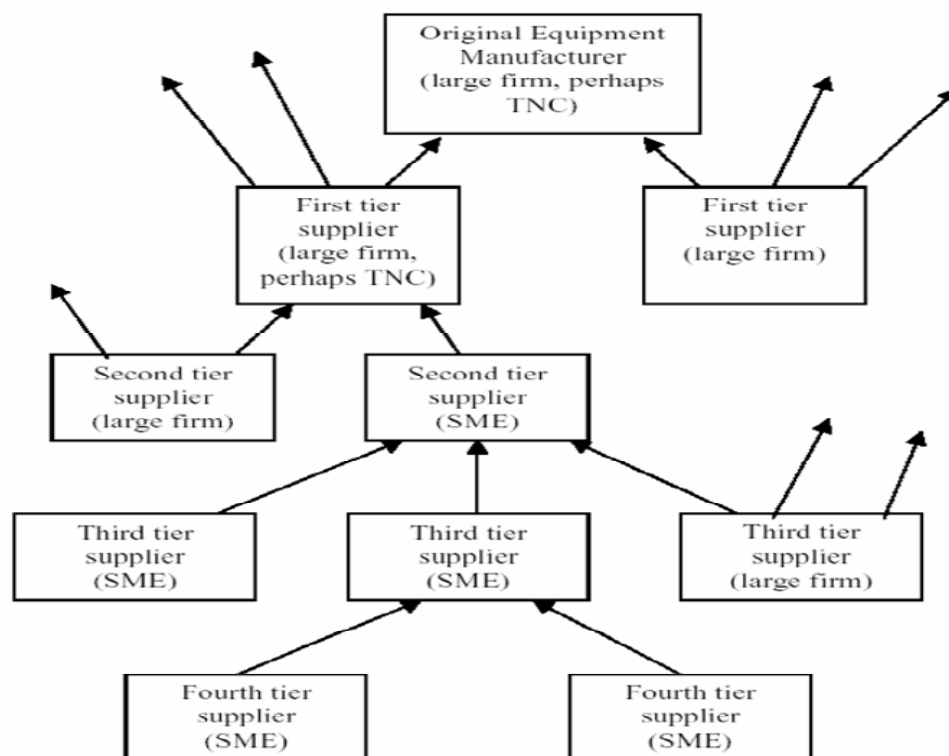
In terms of process innovation (new machines, improving existing machines, and introduction of new ideas), the majority of the SMEs in garments, and automotive parts and components, have done so; a higher percentage than those in others. However, only 21% of SMEs in garments, and 25% of SMEs in automotive parts and components reported introducing new products into new markets compared with 71% of those in others. Finally, about 14% of SMEs in garments and 15% of SMEs in automotive parts and components have

reported introducing new products using new technology compared with 66% of those in others.

### 5.3. SMEs Participation in Production Networks

Following Abonyi (2005), SMEs participation in production networks is limited to the ones that sell their products to those in a higher tier in the production chain as shown in Figure 2.

**Figure 2. SMEs in Production Network**



*Source:* Abonyi (2005).

As noted by Abonyi (2005), SMEs are normally located at a lower tier in the production network and are often associated with performing low-skill, low-value added activities, producing simple products, and competing on price with limited capacity and options for upgrading. The higher the position of SMEs in production networks the better, since being in the lower tier is associated with a greater chance of dropping out due to fiercer cost competition from other suppliers.

From the above definition, 28 out of 99 SMEs in the surveyed sample are in production networks. Out of the 28 in the networks, none are from the garments sector, 8 are from automotive parts and components, and 20 SMEs are from others.

There seems to be not much difference in the SMEs that are in networks, from the general characteristics of the firms in the survey, as described in section 5.1, except for the fact that the SMEs in the production networks seem to have a higher proportion of employees who have a tertiary education level compared with those that are not in networks.

However, their most interesting characteristics are the distinctive features of their business capability and innovation performance, comparing the SMEs in the production networks and those that are not, as shown in Table 7.

**Table 7. Selected Characteristics, Business Capability and Innovation of the Surveyed SMEs by Status in Production Network**

Business Capability and Innovation	IN		OUT	
	N	% of total	N	% of total
Meeting international standards(ISO)	3	10.7	12	16.9
Introducing ICT	17	60.7	26	36.6
Establishing new divisions or plants	9	32.1	14	19.7
Participation in business network, trade fairs	27	96.4	51	71.8
New machines or facilities	24	85.7	50	70.4
Improving existing machines	25	89.3	65	91.5
Introducing new ideas	24	85.7	53	74.6
Introducing new products into new markets	21	75.0	33	46.5
Introducing new products using new technology	19	67.9	29	40.8

*Source:* ERIA – SMEs Survey 2009.

Except for meeting international standards (e.g. ISO) and improving existing equipment, the majority of SMEs participating in production networks has better capabilities and is engaged more in both product and process innovation.

#### **5.4. Constraints Faced by the Surveyed SMEs**

Following OECD (2008), all SMEs in the sample were asked to assess the importance of 44 barriers using a five-point Likert scale (“(1) very significant” to “(5) not significant”) and they were also asked to rank their constraints using 8 main categories, ranging from “very important” (1) to “least important” (8). All the rankings are shown in Tables and 10. The

grouping of the main category of constraints and the complete results for all barriers are given in the appendix.

Table 8 presents the top 10 out of 44 barriers as seen by the surveyed SMEs, ranked using the average response rate (mean). For the ranking of the top 10 constraints for the whole sample, the top 2, i.e., “the lack of managerial time to identify new business opportunities” and “lack of production capacity to expand”, plus the fourth “shortage of working capital to finance new business plans” and the tenth “lack of human capital”, all reflect “Functional Barriers” that are also ranked highly on the main constraint categories in Table 9. The third and ninth ranked constraints are in “Product and Price Barriers” which are also consistently ranked highly in the main categories in Table 9. Ranked sixth is “limited information”, seventh “inability to identify and contact potential business partners”, and eighth “unreliable market data” are all in the “Information Barriers category”. Lastly, ranked fifth “establishing and maintaining trust with business partners” is in the “Distribution, logistics, and Promotion Barriers category” as shown in the appendix.

For SMEs in production networks, the ranking of the top 10 constraints is quite similar to the whole sample, retaining 8 out of the top ten ranked constraints as in the whole sample. Belonging to the “Functional Barriers” main category which ranks the same as in the whole sample, “lack of production capacity to expand” ranked top, followed by “lack of managerial time to identify new business opportunities” ranked third, and “shortage of working capital to finance new business plans” ranked fourth. However, two different constraints from the whole sample are present in the SMEs in the production networks, i.e., ranked ninth “unavailability of inventories/warehousing facilities” and tenth “Perceived risks in current and new business operations” which are within the “Distribution, logistics, and Promotion Barriers” and “Others Barriers” category, respectively.



**Table 8. Ranked Top-Ten Constraints Faced by the Surveyed SMEs and by Status in Production Network**

Rank	Whole Sample	Production Network	
		IN	OUT
1	B4. Lack of managerial time to identify new business opportunities	B6. Lack of production capacity to expand	B4. Lack of managerial time to identify new business opportunities
2	B6. Lack of production capacity to expand	B14. Offering competitive prices to customers	B6. Lack of production capacity to expand
3	B14. Offering competitive prices to customers	B4. Lack of managerial time to identify new business opportunities	B7. Shortage of working capital to finance new business plans
4	B7. Shortage of working capital to finance new business plans	B7. Shortage of working capital to finance new business plans	B14. Offering competitive prices to customers
5	B19. Establishing and maintaining trust with business partners	B19. Establishing and maintaining trust with business partners	B2. Unreliable market data (costs, prices, market shares)
6	B1. Limited Information to locate/analyze markets/business partners	B1. Limited Information to locate/analyze markets/business partners	B5. Insufficient quantity of and/or untrained personnel for market expansion
7	B3. Inability to identify and contact potential business partners	B13. Offering technical/after-sales service	B1. Limited Information to locate/analyze markets/business partners
8	B2. Unreliable market data (costs, prices, market shares)	B3. Inability to identify and contact potential business partners	B19. Establishing and maintaining trust with business partners
9	B13. Offering technical/after-sales service	B20. Unavailability of inventories/warehousing facilities	B3. Inability to identify and contact potential business partners
10	B5. Insufficient quantity of and/or untrained personnel for market expansion	B35. Perceived risks in your current and new business operations	B13. Offering technical/after-sales service

Source: ERIA – SMEs Survey 2009.

The ranking for those SMEs not in production networks retains all top-ten constraints as in the whole sample with differences only in the order of the ranking.

Table 9 shows the ranking of the main category of constraints by the surveyed SMEs. The ranking is the same for the whole sample and for those SMEs that are not in production networks. However, while the “Business Environment Barrier” and “Functional Barriers” rank first and second at the top of the whole sample, and among SMEs not in production

networks, “Product and Price Barriers” and “Functional Barriers” rank first and second for SMEs that are in the production networks, followed by the “Business Environment Barrier”

**Table 9. Ranked Constraints by Category Faced by the Surveyed SMEs**

Rank	All sample	Production Network	
		IN	OUT
1	Business Environment Barrier	Product and Price Barriers	Business Environment Barrier
2	Functional Barriers	Functional Barriers	Functional Barriers
3	Product and Price Barriers	Business Environment Barrier	Product and Price Barriers
4	Information Barriers	Information Barriers	Information Barriers
5	Distribution, logistics, and Promotion Barriers	Tax, Tariff and Non-Tariff Barriers	Distribution, logistics, and Promotion Barriers
6	Tax, Tariff and Non-Tariff Barriers	Distribution, logistics, and Promotion Barriers	Tax, Tariff and Non-Tariff Barriers
7	Procedural Barriers	Procedural Barriers	Procedural Barriers
8	Other Barriers	Other Barriers	Other Barriers

*Source:* ERIA – SMEs Survey 2009.

In summary, results from the survey on the constraints faced by SMEs in Cambodia reaffirm the fact that, overwhelmingly, most surveyed SMEs are operating under severe internal constraints. In general, for the SMEs in the sample and those that are not in the production networks, the majority of the constraints are in their Functional Barriers (management, finance capability) and ability to compete (Product and Price barriers), and “Information” appear to be their main hindrances. However, when separately ranked from the main category, the business environment barrier appears to be the main constraint, reflecting the fact that “peace and stability” is still a great concern given the tragic experiences throughout the country’s history. For SMEs that are in production networks, both the detailed and main category ranking of constraints is consistently high on “Functional Barriers” and “Product and Price Barriers”.

## 5.5. Ranked Effectiveness and Perceptions of Needs-Assistance

The SMEs were also asked whether they have received any assistance from the government or non-governmental organizations (NGOs) and to rate the effectiveness of the assistance which comprises 7 main components.

Table 10 shows the effectiveness and types of assistance for all the surveyed SMEs. Quality of support in “Business linkages and networking” and “Information” is reported to be high, as 89% and 85% of SMEs received these services, respectively. “Training” and “Financing” appear to be lower.

**Table 10. Ranked Effectiveness and Perception of Needs-Assistance to the Surveyed SMEs by Degree of Importance – All Sample**

Rank	Effectiveness of Assistance	% of Assisted SMEs	Perception of Needs- Assistance
1	Information	84.8	Business linkages and networking
2	Business linkages and networking	88.9	Financing
3	Technology development and transfer	50.5	Overall improvement in investment climate
4	Training	24.2	Information
5	Overall improvement in investment climate	63.6	Technology development and transfer
6	Financing	19.2	Counseling and advice
7	Counseling and advice	39.4	Training

Source: ERIA – SMEs Survey 2009.

As for the effectiveness of the assistance, “Information” and “Business linkages and networking” rank first and second, followed by “Technology development and transfer”, “Training”, “Overall improvement in investment climate”, “Financing”, and finally “Counseling and advice”.

It should be logical that the types of assistance that are ranked top in their effectiveness should be ranked lower in terms of needs-assistance of the SMEs. However, “Business linkages and networking”, “Overall improvement in the investment climate” and “Information” still tend to be the most popular type of assistance needed by the SMEs. This

could suggest that these two factors together with “Financing” are the overriding factors which should be addressed to facilitate the further development of SMEs in Cambodia.

When distinguishing between those SMEs that are in production networks and those that are not, Table 11 shows that both groups reported having effective support in “Information” and “Business linkages and networking”. However, those that are not in production networks tend to have insufficient “Financing” support compared with those in production networks.

As far as the perception of needs-assistance is concerned, “Business linkages and networking” and “Financing” are the top priority for those SMEs that are in the networks. For those SMEs that are not in production networks, “Financing” ranks top of the list, followed by “Business linkages and networking”, “Information”, and “Overall improvement in the investment climate”, of the top four.

In summary, the survey on effectiveness and needs-assistance could provide another avenue through which to identify ways and priorities to effectively help SMEs in Cambodia overcome constraints in either their normal expansion or their participation in foreign markets and production networks. The supports can be targeted at SMEs in general or focused according to the degree of importance of their participation in production networks.

**Table 11. Ranked Effectiveness and Perception of Needs-assistance to the Surveyed SMEs by Degree of Importance and their Status in Production Network**

Rank	In Production Network			Out of Production Network		
	Effectiveness of Assistance		Perception of Needs- Assistance	Effectiveness of Assistance		Perception of Needs- Assistance
	Rank (mean)	% of Assisted SMEs		Rank	% of Assisted SMEs	
1	Information	96.4	Business linkages and networking	Information	80.3	Financing
2	Business linkages and networking	100.0	Overall improvement in investment climate	Business linkages and networking	84.5	Business linkages and networking
3	Financing	21.4	Financing	Technology development and transfer	46.5	Information
4	Overall improvement in the investment climate	67.9	Information	Training	23.9	Overall improvement in investment climate
5	Training	25.0	Technology development and transfer	Counseling and advice	36.6	Technology development and transfer
6	Counseling and advice	46.4	Counseling and advice	Overall improvement in investment climate	62.0	Counseling and advice
7	Technology development and transfer	60.7	Training	Financing	18.3	Training

Source: ERIA – SMEs Survey 2009.

### **Box1. Case Study of Ly Ly Food Industry**

Ly Ly Food Industry was established in 2002 by a young Cambodian female entrepreneur with a mission to provide jobs to Cambodians, create a market for local products, namely corn and rice, and substitute imported foreign products. The company has grown quite remarkably since its inception. There were only 25 workers in 2002 with an investment capital of about 100, 000 US Dollars, now the company has more than 100 employees. The production cost structure of the company is 40 percent packaging (plastic bags are imported from Vietnam), 30 percent labor (totally domestic labor), and 30 percent on other costs (electricity, water etc...).

The target market is children, and average sales are about 400, 000 packs per day. The company's net profit is around 10 percent of total sales. Profit is mainly used for reinvestment and business expansion. The machinery was imported from mainland China. On-the-job training is used to create a pool of human resources, with this capacity building partially assisted by several Non-Governmental Organizations such as IMPACT Cambodia, GTZ, and the World Bank. Management skills and production know-how are the top priority for human resources development. IMPACT also provides vitamins to be integrated into the products in order to improve the health of the children/consumers.

The main strengths of the company are entrepreneurship, support from the government and international organizations, human resource management, and marketing strategy. The company's vision (help Cambodian farmers to find a market and assist Cambodian people in finding employment) is strongly supported by the consumers and other key stakeholders alike.

The main challenges are the high cost of electricity and imported packages from the neighboring country, Vietnam. The company wants to export their products to neighboring countries but the complicated export process and their lack of capacity prevent the company from doing so. The lack of high production technology is limiting the production capacity of the company. The owner- manager is looking for a partnership or joint venture with foreign investors to introduce a new high technology form of production. Strategic management to expand new business opportunities is also a constraint.

### **Box1: Case Study of Eurotech**

Eurotech is a drinking water producer in Cambodia. This company is owned by a Cambodian businesswoman. The company was founded in 1993 with only 10 staff and a limited operation (Products are basically distributed in Phnom Penh). Nowadays, Eurotech has become the leading water producer in the country with 200 staff members and its production has been recognized by Cambodian Standard (CS) and ISO 9001-2000. The company revenue in 2008 was 1,740,000 USD. This success, according to the company, is due to the government's efforts in easing all complicated procedures for enterprises so that they can operate their businesses and expand their trade relations with other countries. We can infer that East Asian regionalism has at least made the Royal Government of Cambodia carry out its internal reforms with the aim of attracting local and external investment. In addition, regionalism has also made local producers try their best to improve the quality of products, which are subject to competition from other countries in the region. In the case of Eurotech, the company has tried hard to compete with other products in the local market by importing water purifiers and raw materials (such as bottles and covers) from British and American companies.

Despite some opportunities brought about by East Asian regionalism, the company also pinpointed a series of challenges ranging from the lack of funds or credit support to expand their businesses, lack of knowledge and production skills, and lack of government support for entrepreneurs in seeking overseas markets, weak financial systems, fake products, and high tariff rates on imported raw materials. Another noticeable challenge, which could be triggered by the regional integration of Cambodian SMEs (based on Eurotech's experience), is the high tariff imposed on raw materials, which leads to high production costs. This suggests that the Royal Government of Cambodia needs to expedite the process of tariff cuts so that businesses could have a variety of options to reduce their production costs. The case of Eurotech reveals that the company could have more options in choosing the import source of raw materials, for example from ASEAN countries or non-ASEAN countries, if the tariffs imposed on the materials from ASEAN countries were greatly reduced. By doing so, Eurotech would be able to reduce its production costs, ultimately raising the competitiveness of its products in overseas markets.

## **6. Conclusion and Policy Recommendations**

SMEs have played a significant role in Cambodian economic development, especially in the context of the global economic crisis. Regional integration in Southeast and East Asia has created both opportunities and challenges for Cambodia's SMEs. Their limited capacity for business expansion and integration in production networks restrain Cambodia SMEs from making use of regional integration. Cambodia's trade deficits with its East Asian neighbors clearly prove the inefficiency of Cambodian enterprises in exporting to the regional market.

What we can learn from the results of this survey is that very few Cambodian SMEs are capable of participation in export markets, which reflects their limited capacity and the constraints they face when they want to upgrade.

There are certain different characteristics for those SMEs that participate in production networks from those which do not, such as their higher productivity, business capability and innovation.

Most surveyed SMEs are operating under severe internal constraints. In general, for the SMEs in production networks and those that are not, the constraints in their Functional Barriers (management, finance capability) and ability to compete (Product and Price barriers), and "Information" appear to be their main hindrances. However, when separately ranked from the main sample, the business environment barrier appears to be the main constraint, reflecting the fact that "peace and stability" is still a concern given the tragic events throughout the country's history. For SMEs that are in production networks, both the detailed and main category ranking of constraints is consistently high on "Functional Barriers" and "Product and Price Barriers".

Though SMEs receive some assistance, they still need support in the fields of "Business linkages and networking" and "Financing". "Overall improvement in the investment climate" and "Information" are the overriding factors to facilitate further SME development in Cambodia. For those SMEs that are in production networks, support in "Business linkages and networking", "Overall improvement in the investment climate", and "Financing" are the top priorities. For those SMEs that are not in the production networks, "Financing" ranks top of the list, followed by "Business



linkages and networking”, “Information”, and “Overall improvement in the investment climate”.

Since access to financing is consistently viewed as one of the biggest constraints faced by SMEs, specialized SME banks, which are very common in the region, should be established, or a loan or mortgage guarantee from the government as practiced in Indonesia should be considered. An SME Development Fund could be established, and set aside to be managed by private banks, and could be another option to iron out these constraints.

The best practices in SME Business Development Services (BDS), for example, provided by the Penang Skills Development Center of Malaysia, should be explored. The BDS could provide part or complete support services ranging from training; counseling and advice; technology development and transfer; information; business linkages; and financing.

## References

- Abonyi, G. (2005) "Integrating SMEs into Global and Regional Value Chains: Implications for Subregional Cooperation in Greater Mekong Subregion." Prepared for UNESCAP, Bangkok.
- Asian Development Bank (2003) "Private Sector Assessment for the Kingdom of Cambodia. December 2003." Available at [http://www.adb.org/Documents/Reports/PSA/CAM/longterm\\_action.pdf](http://www.adb.org/Documents/Reports/PSA/CAM/longterm_action.pdf)
- Baily Peter, "Cambodian small and medium sized enterprises: Constraints, policies and proposals for their development". ERIA Research Report. Available at <http://www.eria.org/research/images/pdf/PDF%20No.5/No,5-1-Cambodian.pdf>
- Harner, Stephen (2003) "Financing SMEs in Cambodia: Why do banks find it so difficult?" April 2003. Available at [http://www.ifc.org/ifcext/mekongpsdf.nsf/AttachmentsByTitle/PSDP+14/\\$FILE/PSDP-No-14-EN.pdf](http://www.ifc.org/ifcext/mekongpsdf.nsf/AttachmentsByTitle/PSDP+14/$FILE/PSDP-No-14-EN.pdf)
- Meas, Wat Ho, Characteristics of small and medium enterprises in Cambodia: case study of rice milling enterprises. Available at <http://www.ncsb2006.se/pdf/Characteristics%20in%20Cambodia.pdf>
- Mohd Noor Mohd Shariff and Chea Peou (2008) "The relationship of entrepreneurship values, firm financing and the management and growth performance of small medium enterprises in Cambodia." *Problems and Perspectives in Management* 6, Issue 4, 2008, pp.55-64.
- Organization for Economic Cooperation and Development (OECD) (2008) "Removing Barriers to SME access to International Markets."
- Technical report: SME statistics in Cambodia. Prepared by SME Secretariat and SME statistics technical working group on behalf of SME Subcommittee, November 2007.
- UNDP-Cambodia (2009) "Global Economic Downturn: Opportunities and Challenges." Phnom Penh, UNDP. p.1
- Visal, "Cambodia has more than 300,000 Enterprises and More Than 1.4 Million Workers," *The Raksmei Kampuchia*, Vol.17, Issue. 5070, December 11<sup>th</sup>, 2009.
- World Bank, (2010) Cambodia: Recent Economic Development. World Bank Cambodia Country Office, Fifth edition.

## **Appendix 1. List of Constraints and their Categories**

---

### **INFORMATIONAL BARRIERS**

---

- B1. Limited Information to locate/analyze markets/business partners
  - B2. Unreliable market data (costs, prices, market shares)
  - B3. Inability to indentify and contact potential business partners
- 

### **FUNCTIONAL BARRIERS**

---

- B4. Lack of managerial time to identify new business opportunities
  - B5. Insufficient quantity of and/or untrained personnel for market expansion
  - B6. Lack of production capacity to expand
  - B7. Shortage of working capital to finance new business plans
  - B8. Difficulty in getting credit from suppliers and financial institutions
- 

### **PRODUCT AND PRICE BARRIERS**

---

- B9. Developing new products
  - B10. Adapting to demanded product design/style
  - B11. Meeting product quality/standards/specifications
  - B12. Meeting packaging/labeling requirements
  - B13. Offering technical/after-sales service
  - B14. Offering competitive prices to customers
  - B15. Difficulty in matching competitors' prices
  - B16. Anti-competitive or informal practices
- 

### **DISTRIBUTION, LOGISTICS AND PROMOTION BARRIERS**

---

- B17. Complexity of the production value chain
  - B18. Accessing a new production chain
  - B19. Establishing and maintaining trust with business partners
  - B20. Unavailability of inventories/warehousing facilities
  - B21. Excessive transportation/insurance costs
  - B22. Participation in promotional activities to target markets/business partners
- 

### **PROCEDURAL BARRIERS**

---

- B23. Unfamiliarity with the complexity of procedures/paperwork
  - B24. Difficulties in enforcing contracts and resolving disputes
  - B25. Lack of home government assistance/incentives
  - B26. Unfavorable home rules and regulations
  - B27. Unfavorable host/foreign rules and regulations
- 

### **BUSINESS ENVIRONMENT BARRIERS**

---

- B28. Poor/deteriorating economic conditions (home)
  - B28. Poor/deteriorating economic conditions (foreign)
  - B29. Inadequacy of basic and IT infrastructure (home)
  - B29. Inadequacy of basic and IT infrastructure (foreign)
  - B30. Political instability (home)
  - B30. Political instability (foreign)
-

---

**TAX, TARIFF AND NON-TARIFF BARRIERS**

---

B31. High tax and tariff barriers (home)

B31. High tax and tariff barriers (foreign)

B32. Inadequate property rights protection (*e.g.* intellectual property)- (home)

B32. Inadequate property rights protection (*e.g.* intellectual property) - (foreign)

B33. Restrictive health, safety and technical standards (*e.g.* sanitary and phytosanitary requirements) - (home)

B33. Restrictive health, safety and technical standards (*e.g.* sanitary and phytosanitary requirements) - (foreign)

B34. High costs of Customs administration, in exporting or importing (home)

B34. High costs of Customs administration, in exporting or importing (foreign)

---

**OTHER BARRIERS**

---

B35. Perceived risks in your current and new business operations

B36. Lack of the perceived benefits from joining production networks

B37. Willingness to adopt new business strategy or ideas

---

---

*Source:* Adapted from OECD (2008).

## Appendix 2. Complete Ranking of Perception of Barriers for SMEs

Barrier	Obs	Mean	S.D.	Rank
B4. Lack of managerial time to identify new business opportunities	99	1.67	0.82	1
B6. Lack of production capacity to expand	99	1.72	0.98	2
B14. Offering competitive prices to customers	99	1.76	0.93	3
B7. Shortage of working capital to finance new business plans	99	1.81	0.99	4
B19. Establishing and maintaining trust with business partners	99	2.20	1.29	5
B1. Limited Information to locate/analyze markets/business partners	99	2.21	1.02	6
B3. Inability to indentify and contact potential business partners	99	2.25	1.03	7
B2. Unreliable market data (costs, prices, market shares)	99	2.26	0.92	8
B13. Offering technical/after-sales service	99	2.27	0.89	9
B5. Insufficient quantity of and/or untrained personnel for market expansion	99	2.29	0.95	10
B15. Difficulty in matching competitors' prices	99	2.39	0.85	11
B9. Developing new products	99	2.52	0.96	12
B8. Difficulty in getting credit from suppliers and financial institutions	99	2.54	0.95	13
B20. Unavailability of inventories/warehousing facilities	99	2.54	1.05	14
B10. Adapting to demanded product design/style	99	2.55	1.05	15
B11. Meeting product quality/standards/specifications	99	2.72	1.14	16
B35. Perceived risks in your current and new business operations	99	2.76	1.23	17
B18. Accessing a new production chain	99	2.82	1.08	18
B17. Complexity of production value chain	99	2.84	1.01	19
B28. Poor/deteriorating economic conditions (home)	99	2.91	0.98	20
B37. Willingness to adopt new business strategy or ideas	99	3.04	1.04	21
B29. Inadequacy of basic and IT infrastructure (home)	98	3.05	1.12	22
B21. Excessive transportation/insurance costs	99	3.13	1.04	23
B12. Meeting packaging/labeling requirements	99	3.16	1.22	24
B31. High tax and tariff barriers (home)	99	3.18	1.25	25
B23. Unfamiliarity with complexity of procedures/paperwork	99	3.22	0.94	26
B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) - (home)	98	3.32	1.39	27
B25. Lack of home government assistance/incentives	99	3.33	1.02	28
B30. Political instability (home)	99	3.33	1.29	29
B22. Participation in promotional activities to target markets/business partners	99	3.38	1.10	30
B36. Lack of the perceived benefits from joining production networks	99	3.39	1.04	31
B16. Anti-competitive or informal practices	99	3.67	1.29	32
B34. High costs of Customs administration, in exporting or importing (home)	99	3.70	1.31	33
B24. Difficulties in enforcing contracts and resolving disputes	99	3.93	0.95	34
B32. Inadequate property rights protection (e.g. intellectual property)- (home)	99	4.07	1.13	35
B26. Unfavorable home rules and regulations	99	4.09	1.00	36
B27. Unfavorable host/foreign rules and regulations	99	4.20	1.08	37
B28. Poor/deteriorating economic conditions (foreign)	97	4.28	0.95	38
B29. Inadequacy of basic and IT infrastructure (foreign)	97	4.34	1.02	39
B30. Political instability (foreign)	97	4.42	0.98	40
B31. High tax and tariff barriers (foreign)	98	4.45	0.86	41
B34. High costs of Customs administration, in exporting or importing (foreign)	98	4.58	0.88	42
B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) - (foreign)	97	4.60	0.86	43
B32. Inadequate property rights protection (e.g. intellectual property) - (foreign)	98	4.68	0.73	44

### Appendix 3. Complete Ranking of Perception of Barriers for SMEs in the Production Network

Barrier	Obs	Mean	S.D.	Rank
B6. Lack of production capacity to expand	28	1.61	0.69	1
B14. Offering competitive prices to customers	28	1.64	0.78	2
B4. Lack of managerial time to identify new business opportunities	28	1.79	0.69	3
B7. Shortage of working capital to finance new business plan	28	1.86	0.76	4
B19. Establishing and maintaining trust with business partners	28	2.00	0.90	5
B1. Limited Information to locate/analyze markets/business partners	28	2.04	0.58	6
B13. Offering technical/after-sales service	28	2.07	0.60	7
B3. Inability to indentify and contact potential business partners	28	2.14	0.76	8
B20. Unavailability of inventories/warehousing facilities	28	2.32	0.77	9
B35. Perceived risks in your current and new business operations	28	2.39	0.63	10
B2. Unreliable market data (costs, prices, market shares)	28	2.43	0.69	11
B5. Insufficient quantity of and/or untrained personnel for market expansion	28	2.46	0.74	12
B15. Difficulty in matching competitors' prices	28	2.46	0.69	13
B18. Accessing a new production chain	28	2.46	0.58	14
B17. Complexity of production value chain	28	2.50	0.58	15
B9. Developing new products	28	2.54	0.69	16
B10. Adapting to demanded product design/style	28	2.57	0.88	17
B31. High tax and tariff barriers (home)	28	2.61	0.83	18
B8. Difficulty in getting credit from suppliers and financial institutions	28	2.68	0.72	19
B21. Excessive transportation/insurance costs	28	2.71	0.85	20
B11. Meeting product quality/standards/specifications	28	2.75	1.00	21
B34. High costs of Customs administration, in exporting or importing (home)	28	2.75	0.89	22
B28. Poor/deteriorating economic conditions (home)	28	2.79	0.79	23
B29. Inadequacy of basic and IT infrastructure (home)	28	2.79	0.69	24
B23. Unfamiliarity with complexity of procedures/paperwork	28	2.96	0.64	25
B36. Lack of the perceived benefits from joining production networks	28	3.04	0.84	26
B22. Participation in promotional activities to target markets/business partners	28	3.11	0.88	27
B30. Political instability (home)	28	3.11	1.13	28
B37. Willingness to adopt new business strategy or ideas	28	3.18	0.77	29
B12. Meeting packaging/labeling requirements	28	3.36	0.91	30
B25. Lack of home government assistance/incentives	28	3.39	0.79	31
B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) - (home)	28	3.43	1.32	32
B16. Anti-competitive or informal practices	28	3.79	0.92	33
B30. Political instability (foreign)	28	3.79	1.10	34
B24. Difficulties in enforcing contracts and resolving disputes	28	3.82	0.67	35
B26. Unfavorable home rules and regulations	28	3.82	0.67	36
B29. Inadequacy of basic and IT infrastructure (foreign)	28	3.82	1.09	37
B27. Unfavorable host/foreign rules and regulations	28	3.93	0.98	38
B32. Inadequate property rights protection (e.g. intellectual property)- (home)	28	3.93	1.21	39
B28. Poor/deteriorating economic conditions (foreign)	28	4.11	0.74	40
B31. High tax and tariff barriers (foreign)	28	4.21	0.69	41
B34. High costs of Customs administration, in exporting or importing (foreign)	28	4.36	0.73	42
B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary	28	4.46	0.84	43
B32. Inadequate property rights protection (e.g. intellectual property) - (foreign)	28	4.64	0.49	44

#### Appendix 4. Complete Ranking of Perception of Barriers for SMEs Out of Production Network

Barrier	Obs	Mean	S.D.	Rank
B4. Lack of managerial time to identify new business opportunities	71	1.62	0.87	1
B6. Lack of production capacity to expand	71	1.76	1.08	2
B7. Shortage of working capital to finance new business plans	71	1.79	1.07	3
B14. Offering competitive prices to customers	71	1.80	0.98	4
B2. Unreliable market data (costs, prices, market shares)	71	2.20	0.99	5
B5. Insufficient quantity of and/or untrained personnel for market expansion	71	2.23	1.02	6
B1. Limited Information to locate/analyze markets/business partners	71	2.28	1.15	7
B19. Establishing and maintaining trust with business partners	71	2.28	1.41	8
B3. Inability to indentify and contact potential business partners	71	2.30	1.13	9
B13. Offering technical/after-sales service	71	2.35	0.97	10
B15. Difficulty in matching competitors' prices	71	2.37	0.91	11
B8. Difficulty in getting credit from suppliers and financial institutions	71	2.48	1.03	12
B9. Developing new products	71	2.51	1.05	13
B10. Adapting to demanded product design/style	71	2.54	1.12	14
B20. Unavailability of inventories/warehousing facilities	71	2.62	1.14	15
B11. Meeting product quality/standards/specifications	71	2.70	1.20	16
B35. Perceived risks in your current and new business operations	71	2.90	1.37	17
B18. Accessing a new production chain	71	2.96	1.20	18
B28. Poor/deteriorating economic conditions (home)	71	2.96	1.05	19
B17. Complexity of production value chain	71	2.97	1.11	20
B37. Willingness to adopt new business strategy or ideas	71	2.99	1.13	21
B12. Meeting packaging/labeling requirements	71	3.08	1.32	22
B29. Inadequacy of basic and IT infrastructure (home)	70	3.16	1.24	23
B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) - (home)	70	3.27	1.42	24
B21. Excessive transportation/insurance costs	71	3.30	1.06	25
B25. Lack of home government assistance/incentives	71	3.31	1.10	26
B23. Unfamiliarity with complexity of procedures/paperwork	71	3.32	1.03	27
B31. High tax and tariff barriers (home)	71	3.41	1.32	28
B30. Political instability (home)	71	3.42	1.34	29
B22. Participation in promotional activities to target markets/business partners	71	3.49	1.17	30
B36. Lack of the perceived benefits from joining production networks	71	3.54	1.08	31
B16. Anti-competitive or informal practices	71	3.62	1.41	32
B24. Difficulties in enforcing contracts and resolving disputes	71	3.97	1.04	33
B34. High costs of Customs administration, in exporting or importing (home)	71	4.07	1.27	34
B32. Inadequate property rights protection (e.g. intellectual property)- (home)	71	4.13	1.09	35
B26. Unfavorable home rules and regulations	71	4.20	1.09	36
B27. Unfavorable host/foreign rules and regulations	71	4.31	1.10	37
B28. Poor/deteriorating economic conditions (foreign)	69	4.35	1.03	38
B31. High tax and tariff barriers (foreign)	70	4.54	0.91	39
B29. Inadequacy of basic and IT infrastructure (foreign)	69	4.55	0.92	40
B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) - (foreign)	69	4.65	0.87	41
B34. High costs of Customs administration, in exporting or importing (foreign)	70	4.67	0.93	42
B30. Political instability (foreign)	69	4.68	0.80	43
B32. Inadequate property rights protection (e.g. intellectual property) - (foreign)	70	4.70	0.80	44

## Appendix 5. Ranked Constraints by Category Faced by SMEs

All Sample					In Production Network					Out Production Network				
Barrier	Obs	Mean	S.D.	Rank	Barrier	Obs	Mean	S.D.	Rank	Barrier	Obs	Mean	S.D.	Rank
Business Environment Barrier	98	2.64	1.46	1	Product and Price Barriers	28	3.04	1.23	1	Business Environment Barrier	70	2.44	1.31	1
Functional Barriers	99	2.81	1.55	2	Functional Barriers	28	3.11	1.81	2	Functional Barriers	71	2.69	1.43	2
Product and Price Barriers	99	2.93	1.34	3	Business Environment Barrier	28	3.14	1.69	3	Product and Price Barriers	71	2.89	1.39	3
Information Barriers	96	3.92	1.96	4	Information Barriers	28	3.36	1.91	4	Information Barriers	68	4.15	1.95	4
Distribution, logistics, and Promotion Barriers	97	4.80	1.62	5	Tax, Tariff and Non-Tariff Barriers	28	4.68	1.96	5	Distribution, logistics, and Promotion Barriers	69	4.84	1.53	5
Tax, Tariff and Non-Tariff Barriers	98	4.84	2.03	6	Distribution, logistics, and Promotion Barriers	28	4.71	1.84	6	Tax, Tariff and Non-Tariff Barriers	70	4.90	2.07	6
Procedural Barriers	96	5.96	1.49	7	Procedural Barriers	28	5.96	1.57	7	Procedural Barriers	68	5.96	1.46	7
Other Barriers	86	7.78	0.89	8	Other Barriers	28	8.00	0.00	8	Other Barriers	58	7.67	1.07	8

## Appendix 6. Ranked Effectiveness of the Assistance to the Surveyed SMEs

All Sample					In Production Network					Out Production Network				
Assistance	Obs	Mean	S.D.	Rank	Assistance	Obs	Mean	S.D.	Rank	Assistance	Obs	Mean	S.D.	Rank
Information	84	1.19	0.48	1	Information	27	1.11	0.32	1	Information	57	1.23	0.54	1
Business linkages and networking	88	1.39	0.69	2	Business linkages and networking	28	1.14	0.45	2	Business linkages and networking	60	1.50	0.75	2
Technology development and transfer	50	1.74	0.83	3	Financing	6	1.17	0.41	3	Technology development and transfer	33	1.76	0.87	3
Training	24	1.75	0.74	4	Overall improvement in investment climate	19	1.42	0.51	4	Training	17	1.88	0.78	4
Overall improvement in investment climate	63	1.84	0.70	5	Training	7	1.43	0.53	5	Counseling and advice	26	1.96	0.77	5
Financing	19	1.84	1.07	6	Counseling and advice	13	1.69	0.63	6	Overall improvement in investment climate	44	2.02	0.70	6
Counseling and advice	39	1.87	0.73	7	Technology development and transfer	17	1.71	0.77	7	Financing	13	2.15	1.14	7



### Appendix 7. Ranked Perception of the Assistance to the Surveyed SMEs

All Sample					In Production Network					Out Production Network				
Assistance	Obs	Mean	S.D.	Rank	Assistance	Obs	Mean	S.D.	Rank	Assistance	Obs	Mean	S.D.	Rank
Business linkages and networking	99	2.75	1.64	1	Business linkages and networking	28	2.11	1.03	1	Financing	70	2.63	1.40	1
Financing	98	2.77	1.36	2	Overall improvement in investment climate	28	2.18	1.47	2	Business linkages and networking	71	3.00	1.76	2
Overall improvement in investment climate	99	3.01	1.89	3	Financing	28	3.11	1.23	3	Information	70	3.06	1.56	3
Information	98	3.08	1.45	4	Information	28	3.14	1.15	4	Overall improvement in investment climate	71	3.34	1.95	4
Technology development and transfer	98	5.20	1.57	5	Technology development and transfer	28	5.50	1.37	5	Technology development and transfer	70	5.09	1.64	5
Counseling and advice	97	5.60	1.50	6	Counseling and advice	28	5.79	1.17	6	Counseling and advice	69	5.52	1.62	6
Training	97	5.74	1.29	7	Training	28	6.11	0.88	7	Training	69	5.59	1.41	7

## CHAPTER 6

# Integrating Lao SMEs into a More Integrated East Asia Region

PHOUPHET KYOPHILAVONG

Department of Economics

National University of Laos

*Lao SMEs are at an early stage of development and regional economic integration brings both opportunities and challenges to them. In order to promote SMEs as engines of growth, it is crucial to understand the issues SMEs face during the economic integration process. The main objective of this study is to examine the barriers confronting Lao SMEs and to identify factors enabling successful participation in production networks 151 samples from a nation-wide survey are used for this study. The results show that recently Lao SMEs have performed quite well, but they are still facing various issues; financial constraints are the biggest challenge for Lao SMEs. The characteristics of SMEs in production networks are strong business capacities, a high share of foreign investors, and the ability to access financial sources.*

## 1. Introduction

The economic integration of the ASEAN and East Asian regions has accelerated economic growth, and increased development of regional-and international-level production networks<sup>1</sup>. However, there is still a big gap in the economic development and production networks in this region.

Laos began integrating its economy and production networks into the region by joining ASEAN in 1997 and aims to integrate into the international networks by joining the World Trade Organization (WTO) in 2010. As the Lao economy is still in the early stages of development and lags behind other countries, regional integration presents both opportunities and challenges.

There are various benefits that may be derived from participating in production networks, such as better access to external business resources and knowledge, technology, and finance sources.

Promoting SMEs to join the production networks and subcontracting with large firms/Multi National Enterprises (MNE) could provide a short cut to enhancing SME competitiveness. However, linking up with large firms is rather dependent on practices and preferences and government support. Therefore, integrating Lao SMEs into Global/ASEAN production networks is crucial to developing the SMEs' competitiveness.

Despite the opportunities and complexities of participating in regional and global production networks, studies related to Lao SMEs in production networks are limited. Therefore, the main objective of this study is to gain a better understanding of the characteristics of, and barriers facing Lao SMEs, in order to facilitate participation in production networks. In order to do this, this study has 4 more specific objectives. The first is to examine the barriers facing Lao SMEs. The second is to identify the factors which allow for better participation in production networks. The third is to assess the factors affecting labor productivity using a multi-regression model. The fourth is to assess the factors affecting participation in production networks using an econometric

---

<sup>1</sup> See more studies on SMEs in production networks in Eanst and Kim (2002), Obashi (2009a; 2009b), Kimura and Obayashi (2009), Nicolas (2009), Tambunan (2005) and Tilman (1999).

model. This study used information from an SME survey (151 samples) conducted by the author in October 2009.

The rest of this paper is organized as follows. Section 2 provides background on SME promotional policies. Section 3 provides information on recent economic developments and barriers to SMEs from a general perspective. Section 4 identifies the characteristics of SMEs in production networks. Section 5 assesses the current government support programs for SMEs. Section 6 identifies the factors affecting labor productivity and joining production networks using an econometric model. The final section concludes and contains policy recommendation.

## **2. SME Promotional Policies**

### **2.1. Overall Enterprise Policy Reforms**

Policies promoting enterprise development have been in place since the New Market Mechanism was introduced in 1980. In order to promote the private sector, the government began to privatize state-owned enterprises and introduced modern commercial laws and regulations in the mid-1990s.

Before the introduction of the New Market Mechanism, most large enterprises were State-Owned Enterprises (SOEs). Since then, the government has embarked on a major privatization program with two pillars. The first was transferring SOEs to private ownership (including joint ventures with domestic and foreign enterprises). The second was the privatization of markets by allowing private enterprise (including foreign-owned enterprise) to operate more freely (Bird, 2010). As a result, the number of SOEs was reduced from more than 800 in the early 1990s to 149 in 2004. While the contribution of SOEs to the economy has declined, some industrial sectors (cement, steel, pharmaceuticals, food processing and beverages), the financial sector, and utilities are still state-owned.

In 1994 the government introduced the Business Law, which allowed enterprises to operate freely. In 2006, the government replaced the Business Law with the Enterprises Law in order to reduce administrative costs and barriers. This law introduced a negative

list for registration, promised a 10 day registration period, and simplified registration procedures (Bird, 2010). The government also began to actively promote Foreign Direct Investment (FDI) by introducing the Law on Promotion and Management of Foreign Direct Investment in 1994. To promote FDI and provide more incentives, this law was amended in 2004.

These laws had been important in promoting investment, but because foreign and domestic investors were covered under different investment laws, approval conditions and national treatment were compromised. In order to correct these weaknesses, in July 2009 the National Assembly passed a new investment law. It merges the domestic and foreign investment laws; moves towards national treatment for domestic and foreign investors; eliminates barriers for obtaining investment licenses; and defines investment incentives better (Bird, 2010).

In sum, government has introduced new laws, regulations and programs to support the private sector and increase its competitiveness.

## **2.2. SME Promotion Policies and Production Networks**

The Prime Minister's Office defines SMEs as enterprises that are legally registered and operating according to the prevailing laws of Laos. It classifies SMEs into the following categories: (a.) Small enterprises are those having an annual average number of employees not exceeding 19 people or total assets not exceeding 250 million kip or an annual turnover not exceeding 400 million kip, (b.) Medium sized enterprises are those having an annual average number of employees not exceeding 99 people or total assets not exceeding 1200 million kip or an annual turnover not exceeding 1 billion kip.

In order to promote SME and private sector development in Laos, the government has promulgated Primary Office Decree No.42/PM. The goals of this decree are as follows: a) to improve the regulatory environment; b) to enhance the competitiveness of establishments; c) to expand domestic and international market access; d) to improve access to finance; e) to encourage the development of business organization; f) to enhance entrepreneurial attitudes and characteristics within society. Furthermore, Prime Minister's Degree No. 42/PM established the SME Promotion and Development Office (SMEPDO). The main objective of SMEPDO is to promote the establishment and sustainable development of SMEs. Promoting Lao SMEs in the Asian production

networks is an important means of doing so. In order to promote SMEs, SMEPDO has launched market fairs for SMEs to show and sell their products and exchange information between firms. SMEPDO has also encouraged links between SMEs and FDI.

In addition to SMEPDO, the Lao National Chamber of Commerce and Industry (LNCCI) supports networking between domestic and foreign firms and maintains links between local industries and various government ministries/agencies in order to eliminate impediments that hinder the competitiveness of Lao enterprises in the international market. International organizations are also important sources of support for promoting SME development in Laos.

Despite the work of these organizations, however, SMEs still have issues to overcome before they can fulfill their potential as engines of economic growth in Laos. Until now there have been no SME laws, no an SME Promotion Bank (or SME Fund) to support and promote SME development. Even now, SMEPDO does not have specific programs supporting networking between SMEs and FDI. Finally, previous networks between SMEs, contractors and suppliers seemed to be very poor (Kyophilavong, 2008). Although these networks have seemed to improve as Laos has enhanced economic integration, the government still needs to support internal and external networking.

### **3. Recent Economic Developments and Barriers to SMEs**

#### **3.1. Recent Economic Developments and the Role of SMEs**

The national development goal is to remove the country from the group of least developed countries (LDC) by the year 2020 (GoL, 2004). SME development is crucial to achieving this national goal.

Laos is an agriculture-based economy. In 2005, the agriculture sector accounted for 44% of the GDP of 2.8 US\$ billion; industry accounted for 30% and services for 26%. (World Bank, 2008). However, since 2003, the industrial sector has grown more than 10%, causing the agriculture share of GDP to decline.

Since the NEM was introduced in 1986, Laos has been in transition from a centrally planned economy to a more market-oriented economy. As a result, with the exception of a period of negative growth following the Asian financial crisis of 1997, Laos had generally been achieving high rates of economic growth with low inflation. From 2000-2007 the average economic growth rate was about 7%. Since 2005 inflation has been maintained below double digits; it was about 4.5% in 2007 (World Bank, 2008). Since 2005 the exchange rate has also appreciated, to 9,670 kip per US\$ in 2007 compared to 10,655 kip per US\$ in 2005.

Even though Laos has been maintaining high economic growth with low inflation and a stable exchange rate, it still has serious macroeconomic issues to overcome.

First, Laos is basically facing chronic twin deficits in government spending and international trade. Deficit financing is mainly dependent on foreign sources. The budget deficit to GDP ratio was 2.5% in 2007 (fiscal year) compared to 4.4% in 2005 (fiscal year) (World Bank, 2008). The current account balance deficit to GDP ratio was 17.8% in 2005 compared to 17.4% in 2007 (IMF, 2008).

Secondly, recent economic development in Laos is highly dependent on resources such as mining and hydroelectricity. Recently, Laos was ranked as one of the most resource-rich countries in Asia<sup>2</sup>. More than 570 mineral deposits have been identified, including gold, copper, zinc and lead (World Bank, 2004). Laos is also traditionally known to have a high potential for hydropower production, about 26,000 MW (excluding mainstream Mekong); only 9% of its capacity was being used in 2004 (Pholsena and Phonekeo, 2004). Therefore, since 2002 FDI has flowed rapidly into Laos, especially in resource sectors. In 2007, the actual FDI inflows were estimated as about US\$950 million, an increase of 60% from 2006. About 90% of FDI value is related to the resource industry. Economic growth was about 7.5% in 2007, and the resource sector accounted for 2.5% of this growth (World Bank, 2008). Theoretically, abundant natural resources could promote growth through more investment in infrastructure, health care and human capital development. However, various empirical studies have illustrated that resource-rich countries fail in accelerating growth compared with resource-poor countries for a number of reasons. One important cause of low

---

<sup>2</sup> See the comparison of Lao resource sectors with other countries in Appendix 1.

growth in resource-rich countries is “Dutch disease” syndrome occurs when capital inflows give rise to an appreciation of the real exchange rate, which in turn has a negative effect on tradable goods production (Sachs and Warner, 2001; Coden 1982; and Coden and Neary, 1982). Tradable goods such as agricultural and industrial goods are the engines of long-term economic growth, and therefore a shrinking tradable sector leads to declining growth.

In order to cope with Dutch Disease and ensure long-term economic development, diversifying economic activity and appropriate macroeconomic management are crucial (Kyophilavong and Toyoda, 2008). SMEs help diversify the economy and generate employment, income and new technology.

### **3.2. The Current Situation and Barriers**

Unfortunately, there is a lack of data on enterprises in Laos. Therefore, information about the contribution of SMEs to economic activities is not available. The NSC conducted The Economic Census in 2006 and provided initial information on the size distribution of enterprises (NSC, 2007). The results showed that micro, small and medium-size enterprises dominated the private sector but there were few large firms in the economy. There were a total of 126,913 enterprises employing 346,000 persons. About 93% of enterprises employed less than 5 workers. About 23% of enterprises were located in Vientiane, 30% in the north, 32% in the central region, and 16% in the south. Only 40% held trade registration certificates and 71% held tax registration certificates. The trade sector, including wholesale and retail, was the major source of employment, accounting for about 64% of all employment in all sectors. This survey showed that Lao enterprises were relatively small in terms of employment and sales.

However, SME development seems to have expanded. GTZ (2008) conducted a survey of 390-460 registered establishments in 2005 and 2007, and the results showed that enterprise growth was quite dynamic. Most establishments reported that their activities were expanding. In addition, Kyophilavong *et al.*, (2006) confirmed that about 10% of establishments perceived their business as running very well and more than 17% were optimistic about the future of their business.

According to my knowledge, there are 3 studies of barriers facing SMEs in Laos. First, GTZ (2008) provides information on changes in the awareness of barriers facing



SMEs. The top 4 barriers facing SMEs in 2007 were; access to capital, finding skilled technical labor, access to technology and business development service providers, and increased fees and regulations. Secondly, Kyophiavong *et al.*, (2007) carried out a survey of SMEs in 2006 and collected more than 16,000 samples. According to the survey results, the top 3 obstacles to running SMEs were taxation, macroeconomic stability, and access to finance. Thirdly, ADB-World Bank (2007) carried out a survey on the enterprise investment climate in 2005. The major constraints facing enterprises were identified as infrastructure, regulation, taxation, macroeconomic stability, and access to finance.

In sum, the main barriers for SMEs are access to finance, taxation and regulation, and the business climate, including macroeconomic stability.

## **4. Constraints on SME Growth**

### **4.1. Description of the survey**

In order to obtain a valid, representative sample, the survey was divided into 2 parts: the sampling section process and the survey process. The sampling process followed 4 steps. (1) Collection of a list of establishments from the tax department in the Ministry of Finance, and the enterprise register office at the Ministry of Industry and Commerce. (2) Selection of SMEs which had a contact phone number and detailed address. (3) Division of SMEs was by detailed sectors. (4) Division of SMEs by sectors into big, medium and small.

After finishing the sampling section process, the survey process was conducted as follows. (1) Interviewers (students and lecturers from FEBM), including a pre-test in order to gather feedback from the questionnaire translation. (2) SME owners/directors to be interviewed were called to confirm their willingness to participate in the survey. (3) Appointments were made with owners/ directors of establishments. (4) Face to face interviews were conducted.

The sampling is shown in Table 1. 151 samples were collected in the main cities and provinces in Laos. The sample included 7 sectors such as garments (23%),

parts/machines (3%), wood processing (17%), construction (13%), food/beverages (22%), manufacture (12%), and handcraft (5%). This diversified sample seems to mirror the real situation of Lao SMEs structure. The definition of SMEs in/outside production networks follows Narjoko and Oum (2009). 40 respondent SMEs were members of production networks, while 111 were not.

**Table 1. Sample Distribution**

	Sample	Percent
Vientiane city	79	52.3
Savannakhet province	37	24.5
Champasack	35	23.2
Total	151	100.0

*Source:* Author.

**Table 2. Sample Framework**

Sector	Production network		Overall
	Out	In	
Garment	21	14	23.2
Parts/machine	8	1	3.3
Wood process	17	9	17.2
Construction	16	4	13.3
Food/beverage	25	9	22.5
Manufacture	16	3	12.6
Handicraft	8	0	5.3
Total	111	40	100.0

*Source:* ERIA SMEs survey in 2009.

#### 4.2. Characteristics of SMEs

Table 3 shows the characteristics of SMEs by sector in terms of number of employees, ownership, profits, sales growth, sources of working capital, cost structure, source of intermediate inputs and products, and sales destination.

About 50% of firms were established after 2000, which shows that SMEs are still in the early stages of development. Domestic SMEs completely dominate all sectors, except for garments and parts/machinery, in which foreign firms account for about 20%. Most sectors have profits of more than 15% of total sales. Sales growth slowed down in

2008 because of the impact of the crisis; manufacturing and handicrafts were hit hardest. In all sectors retained earnings are the dominant source of working capital, accounting for more than 80% of total finance. This shows that most sectors face constrained financial access. Except for garments, wood processing and handicrafts, most products are sold domestically.

**Table 3. Characteristics of SMEs**

	Garment	Parts/ machinery	Wood processing	Construction	Food/ beverage	Manufacture	Handicraft
Established since 2000(%)	54.29	55.56	46.15	50	41.18	52.63	50
Number of employment	165	25	46	19	11	46	30
Have staff training (%)	27.3	14.3	0.0	11.8	3.4	18.8	37.5
Ownership (%)							
Domestic	72.0	73.3	93.8	95.0	94.8	90.5	79.5
Foreign	22.4	26.7	3.8	5.0	2.6	9.5	9.1
Profit (%)							
'2007	14.9	18.7	21.0	17.0	17.9	15.7	17.4
'2008	17.6	18.5	22.3	17.5	20.9	15.7	16.4
Sale growth (%)							
'2007	15.4	12.3	12.0	10.6	10.7	20.3	19.4
'2008	9.4	10.4	11.0	7.0	17.3	4.6	-8.9
Source of working capital (%)							
Retained earnings	86.8	92.2	96.7	89.0	95.3	87.9	83.1
Bank	5.1	7.8	3.4	11.0	4.7	9.5	0.0
Other financial institutions	1.9	0.0	0.0	0.0	0.0	2.6	0.0
Others	6.2	0.0	0.0	0.0	0.0	0.0	16.9
Annual cost of interest (%)	2.9	4.1	1.0	3.1	2.0	2.3	0.0
Cost structure (2008) (%)							
Labor	22.8	15.6	14.0	19.8	19.3	15.7	20.9
Raw materials	47.2	45.4	47.1	43.1	36.4	48.6	41.5
Utility	8.7	13.6	11.6	12.3	15.5	9.0	14.6
Interest	1.4	2.4	1.0	1.1	0.4	2.4	0.0
Source of indmediate inputs (%)							
Domestic							
Import	42.9	48.9	4.2	25.3	12.6	39.7	6.3
Products sold (%)							
Domestic	62.6	100.0	84.6	94.1	100.0	95.0	61.9
Export	37.4	0.0	15.4	5.9	0.0	5.0	38.1

*Source:* ERIA SMEs survey in 2009.

Table 4 illustrates business capacity: the firms' efforts to improve business processes or organizations, adopt new production methods, and introduce new goods to market in the past 3 years. The results show that different sectors varied in their ability to meet international standards. Only 6% of manufacturers have met an international standard. About 80% of the parts/machine sector bought new machines or facilities with new functions into operation; however, only about 30% of firms in the construction sector did so. Handicrafts, garments and wood processing introduced new products to market quite actively.

In sum, most sectors tried to improve their business processes, adopt new production methods, and introduce new products to market, but their business capacities are still limited.

**Table 4. Business Capacity**

	Garment	Parts/ machinery	Wood processing	Construction	Food/ beverage	Manufacture	Handicraft
Met an international standard	27.3	14.3	29.2	35.3	31.0	6.3	25.0
Introduced ICT technologies	45.5	28.6	16.7	35.3	3.5	37.5	28.4
Established new divisions or new plants	6.1	28.6	12.5	35.3	6.9	12.5	12.7
Attended/involved in business associations, etc.	48.5	28.6	33.3	23.5	17.2	12.5	32.1
Bought new machines or facilities	45.5	85.7	50.0	29.4	37.9	68.8	37.5
Improved existing machines, equipment	72.7	71.4	62.5	58.8	65.5	81.3	75.0
Introduced new know-how	48.5	57.1	62.5	58.8	34.5	37.5	62.5
introduced new products or services to the market in past three year	45.5	42.9	45.8	29.4	24.1	37.5	50.0
to the new market	60.0	33.3	72.7	40.0	42.9	83.3	25.0
by using the new technologies	60.0	66.7	81.8	100.0	71.4	16.7	50.0

*Source:* ERIA SMEs survey in 2009.

### 4.3. Perceptions of SME Barriers

In order to indentify the barriers facing SMEs, firm managers or owners were asked to rank a list of 38 barriers using a 5-point scale, which ranged from 1 (extremely significant) to 5 (not significant). The barriers were divided into 8 groups: (1) informational barriers; (2) functional barriers; (3) production and price barriers; (4)

distribution, logistics and promotion barriers, (5) procedural barriers; (6) business environment barriers; (7) tax, tariff and non-tariff barriers; (8) other barriers.

Table 5 shows the top-ten barriers across the 7 sectors. In terms of external barriers, SMEs identified a) Poor/deteriorating economic conditions in home market and b) High tax and tariff barriers in home market. The 2008 global financial crisis seems to have had a significant impact of SME performance in Laos. In terms of internal barriers, SMEs are facing logistics and distribution barriers such as the unavailability of inventories/warehousing facilities and excessive transportation/insurance cost. This indicates that poor logistic systems, and residing in a land-locked county, are the major barriers, a result which is consistent with the survey results from ADB-World Bank (2007).

The garment sector perceives external barriers such as poor/deteriorating economic conditions in home market, high tax and tariff barriers in home market, and poor/deteriorating economic condition in foreign markets as most important. The most important internal barriers are the shortage of working capital to finance new business plans and insufficient quality/untrained personnel for market expansion.

The parts/machine sector also perceives both external and internal barriers to running their business. In this sector the top-ranked barriers are the shortage of working capital to finance new business plans; poor/deteriorating economic conditions in home market; the difficulty in matching competitor prices; insufficient quantity/untrained personnel for market expansion; and offering competitive prices to customers.

In wood processing the top-ranked internal barriers are difficulties in matching competitor's prices; the shortage of working capital to finance new business plans; and offering competitive prices to customers. The top-ranked external barriers include poor/deteriorating economic condition in home market and the lack of home government assistance/incentives.

In the construction sector, the top-ranked internal barriers include offering competitive prices to customers; the lack of production capacity to expand; and the shortage of working capital to finance new business plans. The top-ranked external barriers consist of high tax and tariff barrier in home market; poor/deteriorating economic condition in home market; and excessive transportation/insurance cost.

The food/beverage sector perceives internal barriers as the most important. The top-ranked barriers include difficulties in matching competitor's prices; offering competitive prices to customers; and the shortage of working capital to finance new business plans.

In the manufacture sector, firms perceive internal barriers such as difficulties in matching competitor's prices and offering competitive prices to customers. They also perceive external barriers such as high tax and tariff barriers in home country.

Firms in the handicraft sector perceive internal barriers as most important. The top-ranked internal barriers include the shortage of working capital to finance new business plans; the lack of production capacity to expand; establishing and maintaining trust with business partners; and insufficient quantity/untrained personal for market expansion.

Table 6 shows the top 10 barriers faced by SMEs in- and outside production networks. SMEs outside production networks perceive both internal and external barriers. Internal barriers include offering competitive prices to customers; difficulty in matching competitors' prices; and the shortage of working capital to finance new business plans. The external barriers faced by SMEs outside production networks include poor/deteriorating economic conditions in the home market; high tax and tariff barriers in the home market; and the high costs of customs administration, in exporting or importing (home market).

**Table 5. Top Ten Barriers Facing SMEs, by Sector**

Rank	Overall	Garment	Parts/machinery	Wood process	Construction	Food/beverage	Manufacture	Handicraft
1	Poor/deteriorating economic conditions (a) Home Market)	Poor/deteriorating economic conditions (a) Home Market)	Shortage of working capital to finance new business plan	Difficulty in matching competitors' prices	Offering competitive prices to customers	Difficulty in matching competitors' prices	Difficulty in matching competitors' prices	Shortage of working capital to finance new business plan
2	High tax and tariff barriers (Home Market)	High tax and tariff barriers (Home Market)	Poor/deteriorating economic conditions (a) Home Market)	Poor/deteriorating economic conditions (a) Home Market)	High tax and tariff barriers (Home Market)	Offering competitive prices to customers	Offering competitive prices to customers	Lack of production capacity to expand
3	Unavailability of inventories/warehousing facilities	Shortage of working capital to finance new business plan	Difficulty in matching competitors' prices	Lack of home government assistance/incentives	Poor/deteriorating economic conditions (a) Home Market)	B35. Perceived risks in your current and new business operations	High tax and tariff barriers (Home Market)	Establishing and maintaining trust with business partners
4	Excessive transportation/insurance costs	Poor/deteriorating economic conditions (b) Foreign Market)	Insufficient quantity of and/or untrained personnel for market expansion	Shortage of working capital to finance new business plan	Lack of production capacity to expand	Shortage of working capital to finance new business plan	High costs of Customs administration, in exporting or importing (Home Market)	Lack of home government assistance/incentives
5	Restrictive health, safety and technical standards (Home Market)	Insufficient quantity of and/or untrained personnel for market expansion	Offering competitive prices to customers	Offering competitive prices to customers	Excessive transportation/insurance costs	Poor/deteriorating economic conditions (a) Home Market)	Poor/deteriorating economic conditions (a) Home Market)	Insufficient quantity of and/or untrained personnel for market expansion
6	Insufficient quantity of and/or untrained personnel for market expansion	Lack of home government assistance/incentives	Lack of managerial time to identify new business opportunities	B35. Perceived risks in your current and new business operations	Shortage of working capital to finance new business plan	High tax and tariff barriers (Home Market)	Excessive transportation/insurance costs	Offering competitive prices to customers
7	Inadequate property rights protection (Home Market)	Offering competitive prices to customers	Anti-competitive or informal practices	Anti-competitive or informal practices	High costs of Customs administration, in exporting or importing (Home Market)	High costs of Customs administration, in exporting or importing (Home Market)	Unreliable market data (costs, prices, market shares)	Difficulty in matching competitors' prices
8	Unreliable market data (costs, prices, market shares)	B35. Perceived risks in your current and new business operations	Lack of production capacity to expand	High tax and tariff barriers (Home Market)	Difficulty in matching competitors' prices	Limited Information to locate/analyze markets/business partners	Anti-competitive or informal practices	Poor/deteriorating economic conditions (b) Foreign Market)
9	B36. Lack of the perceived benefits from joining production networks	Anti-competitive or informal practices	Excessive transportation/insurance costs	Unfamiliarity with complexity of procedures/paperwork	Lack of home government assistance/incentives	Insufficient quantity of and/or untrained personnel for market expansion	Limited Information to locate/analyze markets/business partners	Limited Information to locate/analyze markets/business partners
10	Anti-competitive or informal practices	Lack of production capacity to expand	Inadequate property rights protection (Home Market)	Lack of production capacity to expand	Unfavourable home rules and regulations	B37. Willingness to adopt new business strategy or ideas	Inadequacy of basic and IT infrastructure (b) Foreign Market)	Developing new products

Source: ERIA SMEs survey in 2009.

SMEs inside production networks tend to perceive external barriers rather than internal barriers as being most important. The top-ranked external barriers include lack of home government assistance/incentives; perceived risks in current and new business operations, poor/deteriorating economic conditions in the home market; and inadequate property rights protection (home market). This reflects the recent severe impact on their business resulting from the slowdown of economic activities in foreign and domestic markets due to the global financial crisis.

**Table 6. Top Ten Barriers Faced by SMEs, In- and Outside Production Networks**

Rank	Production network	
	Out	In
1	Offering competitive prices to customers	Lack of home government assistance/incentives
2	Difficulty in matching competitors' prices	Difficulty in matching competitors' prices
3	Poor/deteriorating economic conditions(Home Market)	Perceived risks in your current and new business operations
4	High tax and tariff barriers (Home Market)	Shortage of working capital to finance new business plan
5	Shortage of working capital to finance new business plan	Poor/deteriorating economic conditions (Home Market)
6	High costs of customs administration, in exporting or importing (Home Market)	Inadequate property rights protection (Home Market)
7	Excessive transportation/insurance costs	Willingness to adopt new business strategy or ideas
8	Insufficient quantity of and/or untrained personnel for market expansion	Lack of production capacity to expand
9	Anti-competitive or informal practices	High tax and tariff barriers (Home Market)
10	Lack of production capacity to expand	Offering competitive prices to customers

*Source:* ERIA SMEs survey in 2009.

In addition, firms also simultaneously ranked all 8 barrier types from 1 (extremely important) to 8 (least important). These results are shown in Table 7. The top 3 barrier types are (1) production and price barriers; (2) distribution, logistics and promotion barriers; and (3) business environment barriers. These results reflect poor logistic systems and deteriorating economic conditions due to the global financial crisis. They



also demonstrate that SMEs lack capacities and competitiveness in production and price competition. As Laos will access to the World Trade Organization (WTO) soon, it is vital for policy makers to increase the capacities and competitiveness of SMEs.

For SMEs inside production networks, the top-three barrier types are (1) production and price barriers; (2) business environment barriers; and (3) distribution, logistics and promotion barriers. For SMEs outside production networks, the top-three barrier types are (1) production and price barriers; (2) distribution, logistics and promotion barriers; and (3) business environment barriers.

**Table 7. Ranked Barrier Types, by In/Out Production Network**

Rank	Overall SMEs	Production network	
		Out	In
1	Production and price barriers	Production and price barriers	Production and price barriers
2	Distribution, logistics and promotion barriers	Distribution, logistics and promotion barriers	Business environment barriers
3	Business environment barriers	Business environment barriers	Distribution, logistics and promotion barriers
4	Functional barriers	Functional barriers	Functional barriers
5	Procedural barriers	Tax, tariff and non tariff barriers	Procedural barriers
6	Tax, tariff and non tariff barriers	Procedural barriers	Information barriers
7	Information barriers	Information barriers	Tax, tariff and non tariff barriers

Source: ERIA SMEs survey in 2009.

## 5. Characteristics of SMEs in Production Networks

In order to promote SMEs in ASEAN production networks, the characteristics of SMEs in- and outside production networks are identified. The results are shown in Table 8. Firms involved in production networks are likely to (1) be in the garment sector; (2) have a high share of foreign investors; (3) have high growth of sales; and (4) have high abilities in accessing finance sources such as banks and other financial institution.

Table 9 shows business abilities in-and outside production networks. It is clear that SMEs in production networks have made efforts to improve business processes or

organization and have also adopted new production methods in the past 3 years. SMEs in production networks are characterized by the following business abilities: (1) have met an international standard; (2) have established new divisions or new plants (3) have attended/been involved in business associations; (4) have improved existing machines, equipment; and (5) have introduced new products or services to the market.

In sum, the SMEs in production networks have strong business capacities in terms of improving business processes and adopting new technology. Foreign investor share also plays an important role in allowing SMEs to join the networks. SMEs in networks seem to have the ability to access financial sources from banks and other financial institutions. Lastly, SMEs in production networks perform well. On the other hand, it is quite difficult to say that firm size in term of sales and employment, or the firm's age is key determinants for participation in a production network.

**Table 8. Characteristics of SMEs In- and Outside Production Networks.**

Number of employment	Production network	
	Out	In
	65.1	46.0
Type of firms		
Garment	18.9	35.0
Parts, components/electrical,parts	7.2	2.5
Wood process	15.3	22.5
Construction	14.4	10.0
Food/drink	22.5	22.5
Manufacture	14.4	7.5
Handicraft	7.2	0.0
Ownership		
Domestic	88.5	81.5
Foreign	9.3	13.3
Profit (%)		
'2007	17.5	16.8
'2008	18.7	19.3
Sale growth (2007)	13.1	15.5
Cost structure (2007)		
Labor	19.8	15.7
Raw materials	42.9	51.4
Utility	12.0	11.2
Interest	1.4	0.9
Others	6.4	3.9
Source of working capital		
Retained earnings	91.1	90.8
Bank	6.6	4.3
Other financial institutions	0.0	2.9
Others	2.4	2.1
Source of expansion capital		
Retained earnings	96.3	87.1
Bank	0.8	6.5
Other financial institutions	0.0	2.8
Others	2.9	3.6

Source: ERIA SMEs survey in 2009.

**Table 9. Business Capacity In- and Outside Production Networks**

	Production network	
	Out	In
Met an international standard	18.9	50.0
Introduced ICT technologies	27.9	27.5
Established new divisions or new plants	9.0	22.5
Attended/involved in business associations, etc.	27.0	42.5
Bought new machines or facilities	49.6	40.0
Improved existing machines, equipment	63.1	72.5
Introduced new know-how	46.9	55.0
introduced new products or services to the market in past three year	33.33	45.00
to the new market	43.24	83.33
by using new technologies	51.35	100
The average percentage increase in sales	20.2	24.4

*Source:* ERIA SMEs survey in 2009.

## 6. Assessment of Current Government Assistance

As Lao SMEs are in the early stages of development, government and international agencies have implemented some programs to support SMEs. In order to make this support more effective, it is important to examine the adequacy of these programs. The survey divided all support and assistance into 8 categories: (1) training; (2) counseling and advice; (3) technology development and transfer; (4) information; (5) business linkage and networking; (6) financing; (7) overall improvement in investment climate; (8) others. First, firms were asked whether they received support and assistance from the government or NGOs. Secondly, if they received support and assistance, they were asked to rate the effectiveness of programs in each category from 1 (extremely effective) to 5 (least effective).

In general, SMEs seem to have received little support and assistance from the government or NGOs. Overall, about 20% of SMEs receive some form of assistance. Among the 8 categories, the lowest-ranked forms of support and assistance received

from the government and NGOs were: (1) Financing; (2) Technology development and transfer; and (3) Business linkages and networking. SMEs in production networks seem to have more support and assistance from the government and NGOs. About 30% of SMEs in production networks have received assistance from the government or NGOs and others but only 20% of SMEs not in production networks have received assistance. In particular, support and assistance in market information and business linkages and networking for SMEs in production networks seem higher than for SMEs outside the networks. These results confirm the benefits of participating in production networks.

In terms of the effectiveness of support programs, these forms of assistance seem to be effective for SMEs both in-and outside networks, except for financing support (Table 11). SMEs in production networks are less satisfied with their financing support.

**Table 10. Assistance from Government, NGOs** (%)

	Production network		Overall
	Out	In	
Training in general	31.5	45.0	35.1
Counseling and advice	40.5	45.0	41.7
Technology development and transfer	20.7	25.0	21.9
Market information	22.5	40.0	27.2
Business linkages and networking	20.7	37.5	25.2
Financing	20.7	22.5	21.2
Overall improvement in investment climate	27.9	20.0	25.8
Others	8.1	2.5	6.6

*Source:* ERIA SMEs survey in 2009.

**Table 11. Adequacy of Assistance**

	Production network		Overall
	Out	In	
Training in general	1.9	2.5	2.2
Counseling and advice	2.1	2.3	2.2
Technology development and transfer	2.6	1.7	2.1
Market information	2.5	2.7	2.6
Business linkages and networking	2.5	2.8	2.6
Financing	2.8	3.5	3.1
Overall improvement in investment climate	2.4	2.7	2.5

*Source:* ERIA SMEs survey in 2009.

In addition, the firms were also asked to rank all eight forms of assistance to SMEs from 1 (most important) to 8 (least important). The results are shown in table 12.

Overall SMEs perceived that financing support was the most important for them and SMEs both in- and outside production networks gave the same result.

The main reasons for financial constraints are: (1) Financial system is still at early stages of development, most banks are state-owned, and some of them experienced large amounts of non-performing loans (NPL) in the past (Kyophilavong, 2007). Therefore, most of state-owned commercial banks have little incentive to provide credit to SMEs; (2) most of the owners of SMEs have elementary education; loan procedures in banks are quite complicated for them. Therefore, it is quite difficult for them to access banks; (3) The government still does not have a financial support program for SMEs. Recently however, the banking sector has been reformed and private and foreign banks have increased in number. Some of the banks have targeted SMEs. In addition, government has also planned to set up an SMEs Fund. This indicates that SMEs may have better opportunities to access finance sources now, as compared with the past.

**Table 12. Ranked Perception of Assistance**

Rank	Overall SMEs	Production network	
		Out	In
1	Financing	Financing	Financing
2	Counseling and advice	Training	Business linkages and networking's
3	Overall improvement in investment climate	Counseling and advice	Overall improvement in investment climate
4	Training	Overall improvement in investment climate	Counseling and advice
5	Business linkages and networking's	Technology development and transfer	Training
6	Technology development and transfer	Business linkages and networking's	Technology development and transfer
7	Information	Information	Information
8	Others	Others	Others

Source: ERIA SMEs survey in 2009.

## 7. Factors Affecting Firm Productivity and Production Networks

### 7.1. Factors Affecting Firm Productivity

The Cobb-Douglas production function is used for estimating the factors affecting labor productivity. The Cobb-Douglas production function is defined as follows:

$$Y_{it} = A * K_{it}^{\alpha} L_{it}^{\beta} e^{X_{it}} \quad (1-1)$$

A is a constant term,  $Y_{it}$ ,  $K_{it}$ , and  $L_{it}$  are total output, capital and labor for firm  $i$  at time  $t$  and  $X_{it}$  is a group of possible factors, which many affect labor productivity respectively.  $\alpha$ ,  $\beta$  are coefficients of the production that is assumed to be constant across firms. Dividing both sides by  $L_{it}$  equation (1-1) can be rewritten as:

$$\frac{Y_{it}}{L_{it}} = A \left( \frac{K_{it}}{L_{it}} \right)^{\alpha} (L_{it})^{\alpha+\beta-1} e^{X_{it}} \quad (1-2)$$

Taking the logarithm of both sides of equation (1-2), the equation becomes:

$$\ln\left(\frac{Y_{it}}{L_{it}}\right) = \ln(A) + \alpha * \ln\left(\frac{K_{it}}{L_{it}}\right) + (\alpha + \beta - 1)\ln(L_{it}) + X_{it} \quad (1-3)$$

According to Solow (1956), there are many factors affecting total factor productivity (TFP) such as technological progress, research activity, human capital, trade, a firm's age and size, ownership and other unobservable factors. Therefore,  $X_{it}$  can be written as another functional form as follows.

$$\begin{aligned} X_{it} = f(\text{lg6emp, group2, group3, group5, q5for, fin1, fin2, fin3, ipn1,} \\ \text{q11bp1, q11bp2, q11bp3, q11bp4, q14r1, q14r2, q14r3, q14r4,} \\ \text{q14r5, q14r6, q14r7}) \end{aligned} \quad (1-4)$$

A detailed explanation of variables is shown in Table 13.

**Table 13. Variables for Regression**

Symbol	Explanation	Value
lq6emp	Total employment	person
group2	Human resources investment	yes=1, other=0
group3	Tertiary education	yes=1, other=0
group5	Domestic firm	yes=1, other=0
q5for	Foreign firm	yes=1, other=0
fin1	Retained earnings	%
fin2	Bank	%
fin3	Other financial institution	%
ipn1	In-production network	yes=1, other=0
q11bp1	Met an international standard	yes=1, other=0
q11bp2	Introduced ICT	yes=1, other=0
q11bp3	Established new divisions or new plants	yes=1, other=0
q11bp4	Attended in business association	yes=1, other=0
q14r1	Information barriers	Rank from 1 to 8
q14r2	Functional barriers	Rank from 1 to 9
q14r3	Production and price barriers	Rank from 1 to 10
q14r4	Distribution, logistic barriers	Rank from 1 to 11
q14r5	Procedural barriers	Rank from 1 to 12
q14r6	Business environment barriers	Rank from 1 to 13
q14r7	Tax, tariff and non-tariff barriers	Rank from 1 to 14

*Source:* Author.

We used the Ordinary Least Square (OLS) method. In order to avoid multicollinearity in the independent variables, the correlation matrix method was employed. We chose variables which had correlations of less than 50%. We estimated labor production functions in order to investigate the impact of various variables on labor productivity. The results are explained below.

The adjusted  $R^2$  of this model was 0.63%, showing the model fitted well. The Breusch-Pagan test indicated that there was no heteroscedasticity. Foreign firm (q5for) and introduced ICT (q11bp2) were found to be statistically positively significant with the expected signs for labor productivity. On the other hand, Business environment barriers (q14r6) and number of employment (q6emp) were found to be statistically negatively significant on labor productivity. However, in-production network (ipn1) was found to be not statistically significant on labor productivity.



**Table 14. Factors Affecting Labor Productivity**

Symbol	Coefficient	t value
lq6emp	-0.28*	-2.23*
group2	0.34	0.70
group3	0.39	1.01
group5	0.79	0.94
q5for	0.01***	1.77
fin1	0.54	0.40
fin2	0.17	0.42
fin3	0.30	-0.24
ipn1	0.18	0.53
q11bp1	0.13	0.37
q11bp2	0.76***	1.72
q11bp3	-0.37	-0.80
q11bp4	0.16	0.48
q14r1	0.06	0.67
q14r2	-0.13	-1.20
q14r3	0.02	0.18
q14r4	-0.06	-0.59
q14r5	-0.15	-1.37
q14r6	-0.23*	-2.37
q14r7	0.09	-1.04
_cons	9.64	3.46
Sample	151	
R-squared	0.207	
Prob > F	0.099	

Source: Author's estimation.

Note:\* denotes statistical significance at 1% level.

\*\* denotes statistical significance at 5% level.

\*\*\* denotes statistical significance at 20% level.

## 7.2. Determinants of factors affecting SME production networks

In this section, we identify the factors affect SME in-outside production network using logit model. Here, we define networking according to Narjoko and Oum (2009).

In order to assess the factors that influence production networks, the logit model is used. This model is particularly suited to the task at hand because it is designed to handle regressions involving dichotomous dependent variables. This consideration is singularly important since business owners were asked to say whether their product is exportable or not. These responses, coded 1 for export and coded 0 for other, is called the dependent variable. The explanatory variables describe various attributes of type of establishment, type, size and etc (for more details see Table 19).

Theoretically, a logit model assumes the form of a logistic function in which the probability  $p$  of one outcome is given as:

$$p = \frac{e^{a+b_1X_1+\dots+b_nX_n}}{1 + e^{a+b_1X_1+\dots+b_nX_n}} \quad (2-1)$$

where  $a$  is a constant,  $X_1 + \dots + X_n$  are the independent variables,  $b_1 + \dots + b_n$  are parameters of coefficients, and “e” is the natural logarithm 2.71828. The alternative outcome, the probability of performance of establishment, is given as:

$$1 - p = \frac{1}{1 + e^{a+b_1X_1+\dots+b_nX_n}} \quad (2-2)$$

Therefore, the odds ratio in trend of established performance are:

$$p / (1 - p) = e^{a+b_1X_1+\dots+b_nX_n} \quad (2-3)$$

The logistic function in equation (2-3) represents an S-shaped curve ranging from 0 through 1 with points of inflection occurring at  $y = 0.5$ . Within this function  $p/(1-p)$  is non-linearly related to the independent variables. Also, as the independent variables range from negative infinity to positive infinity,  $p/(1-p)$  can only take on values ranging between 0 and 1, a situation that makes the model untenable for estimation using the Ordinary Least Square method (Styles and Peterson 1984). By means of a logit transformation, the non-linear function can be converted into an unbounded linear one  $L$ , in which  $L$  can take on any value greater than 0 while, at the same time, its probabilities remain free to range between 0 and 1. This conversion is done by taking the natural logs of both sides. Thus:

$$L = \ln( p / 1 - p ) = a + b_1 X_1 + \dots + b_n X_n \quad (2-4)$$

The predicted frequencies “ $L$ ” are log odds or “logits”. The logits are linearly related to the independent variables and, at the same time, their probability of occurrences is restricted to the range (0, 1). Estimates of the parameters  $b_1 + \dots + b_n$  can be used to calculate magnitude and direction of marginal effects. The logit model used in this study assumed the form shown in equation 2-4.

$$\ln(P_i / 1 - P_i) = B_1 + B_2 X_1 + B_3 X_2 + B_4 X_3 + B_5 X_4 + B_6 X_5 + B_7 X_6 + e_i \quad (2-5)$$

Based on the above Logit model, we could identify the factors that affect production networks. The definition of variables in model is shown in Table 15.

**Table 15. Definitions of variables for model**

Symbol	Explanation	Value
X1	Total sale	US\$
X2	Total employment	Person
X3	Human resources investment	yes=1, other=0
X4	Tertiary education	yes=1, other=0
X5	Domestic firm	yes=1, other=0
X6	Foreign firm	yes=1, other=0
X7	Bank	Percent of capital
X8	Met an international standard	yes=1, other=0
X9	Established new divisions or new plants	yes=1, other=0
X10	Attended in business association	yes=1, other=0
X11	Information barriers	Rank from 1 to 8
X12	Functional barriers	Rank from 1 to 8
X13	Production and price barriers	Rank from 1 to 8
X14	Distribution, logistic barriers	Rank from 1 to 8
X15	Procedural barriers	Rank from 1 to 8
X16	Business environment barriers	Rank from 1 to 8
X17	Tax, tariff and non-tariff barriers	Rank from 1 to 8

Source: Author.

**Table 16. Result of Logit Model**

Symbol	Coefficient	z value
X1	0.00	1.08
X2	-0.004	-1.42
X3	-1.14	-1.32
X4	1.63*	2.53
X5	-1.74	-0.93
X6	-0.01	-0.63
X7	0.033	0.49
X8	1.70*	2.99
X9	1.61*	2.13
X10	0.83	1.47
X11	-0.04	-0.3
X12	-0.02	-0.16
X13	-0.36*	-2.02
X14	0.28	1.57
X15	-0.007	-0.04
X16	0.03	0.19
X17	0.07	-0.51
cons	0.16	0.04
obs	147	
LR chi2(19)	38.34	
Prob > chi2	0.01	
Log likelihood	-64.84	
Pseudo R2	0.23	

Source: Author's estimation.

Note:\* denotes statistical significance at 1% level.

\*\* denotes statistical significance at 5% level.

\*\*\* denotes statistical significance at 10% level.

## 8. Conclusion and Policy Recommendations

Economic integration in the region provides opportunities for SMEs to participate in the ASEAN production networks, and joining production networks could increase the competitiveness of SMEs. Therefore, the government has given high priority to promoting membership by Lao SMEs of business networks in ASEAN. The main objective of this study is to gain better understanding of the characteristics of, and barriers facing Lao SMEs so that they can participate effectively in production networks. From the analysis of the results, the preliminary conclusions are as follows.

Even though Lao SMEs have performed quite well recently, with total average profits of about 18%, they are facing financial constraints and only a small portion of SMEs have received financing from banks and other financial institutions.

Some SMEs have improved their businesses and adopted new production methods, but only a small portion. In terms of internal barriers, a shortage of working capital is top ranked, followed by the difficulty of matching competitors' prices. In terms of external barriers, lack of government assistance/incentives and poor economic conditions in home market are top ranked. Production and price barriers are ranked as the most important barriers.

Lao SME participation in production networks in Asia is still in the early stages of development. The main features of SMEs participating in production networks are strong business capacities, high share of foreign investment, and the ability to access financial sources.

Lao SMEs are facing various issues such as a shortage of working capital, difficulty matching competitor's prices, lack of government assistance/incentives and poor economic conditions. Therefore, it is crucial to solve these issues in order to enhance Lao SME participation in production networks in Asia. In order to promote production networks, it is especially important to address is the shortage of working capital, as well as to improve SMEs to meet international standards.

## References

- ADB-World Bank (2007), *Lao PDR, Private Sector and Investment Climate Assessment: Reducing Investment Climate Constraints to Higher Growth*, Asian Development Bank (ADB)- the World Bank, World Bank, Lao Office, Laos.
- Bird, K (2010), *Lao PDR: Competition Policy in a Transition Economy*, Conference Paper, Workshop on Competition Policy: Building Blocks for a Competitive Society, 11-12 January 2010, Asian Development Bank, Manila.
- Corden, W. M. and Neary, J. P. (1982), “Booming Sector and De-industrialization in a Small Open Economy”, *Economic Journal*, 92.
- Ernst, Dand Kim, L (2002), Global production networks, knowledge diffusion, and local capability formation, *Research Policy*, Volume 31, Issues 8-9, December 2002, Pages 1417-1429
- GoL. (2004). *National growth and poverty eradication strategy*, Government of the Lao PDR Vientiane, Laos.
- GTZ (2008), *Enterprise Baseline Survey 2007*, GTZ, Laos-German Programme on Human Resources Development for Market Economy, Vientiane, Laos.
- Henderson, J., Dicken, P., Hess., M., Coe., N., and Yeung, H.W-C. (2002), Global Production Networks and the Analysis of Economic Development, *Review of International Political Economy*, Vol. 9, No. 3, pp. 436-464
- IMF (2008), *IMF Executive Board Concludes 2008 Article IV Consultation with the Lao People's Democratic Republic*, International Monetary Fund. Available at <http://www.imf.org/external/np/sec/pn/2008/pn08109.htm>
- IMF (2007), *World Economic and Financial Survey, Regional Economic Outlook, Asia and Pacific*, International Monetary Fund, Washington, DC.
- Obashi, A (2009a), Stability of production networks in East Asia: Duration and survival of trade, *ERIA Discussion Paper Series*, ERIA-DP-2009-03.
- Obashi, A (2009b), Resiliency of production networks in Asia: Evidence from the Asian crisis, Conference Paper, Session 1: Trade-Led Recovery and Production Networks, *Asia-Pacific Economist's Conference – Trade-Led Growth in Times of Crisis-*, Bangkok, 2-3 November
- Kimura, F and Obayashi, A (2009), International production network: Comparison between China and ASEAN, *ERIA Discussion Paper Series*, ERIA-DP-2009-01.
- Kyophilavong, P., Senesouphap, C., Suvannaphakdy, S., and Nakhiengchan, A. (2007), Determinants of Establishment Performance in Lao PDR.”, *Journal of Economics and Business Management*, Volume 3, No.1.
- Kyophilavong, P (2007), “Monetary and exchange rate policies in Lao PDR.”, *Conference Paper*, in Regional Workshop on Monetary and Exchange Rate Policies in Cambodia, LAO PDR and VIETNAM: THE SCOPE FOR

REGIONAL COOPERATION, Asian Development Bank, Bangkok, Thailand, 22th July 2007.

- Kyophilavong, P (2008), SMEs Development in Lao PDR., in eds., Hank Lim, *Asian SMEs and Globalization*, ERIA Research Project Report 2007, the Economic Research Institute for ASEAN and East Asia (ERIA).
- Kyophilavong, P and Toyoda, T (2008), “Impacts of Foreign Capital Inflows on the Lao Economy”, in Toyoda eds, *Empirical Research on Trade and Finance in East Asia*, Research Series, Hiroshima Shudo University.
- Sachs, J and Warner, A.M (2001), Natural Resources and Economic Development: The Curse of Natural Resources, *European Economic Review* 45, pp. 827-838.
- Solow, R. M. (1956), A Contribution to the Theory of Economic Growth, *Quarterly Journal of Economics* 70: 65-94.
- Styles, D. J and George L. Peterson. (1984), “A review of Logit model with implications for modeling recreation choices.”, *Journal of Leisure Research* 16, No. 4: 295-310.
- Narjoko, D and Oum, S. (2009), “ SMEs in Regional Production Networks: A Preliminary Result “, ERIA-SME Project - Second Workshop, Jakarta, January 22, 2010.
- NSC (2007), *Report of Economic Census in 2006*, National Statistics Center, Vientiane, Laos.
- Nicolas, F (2009), Regional production networks and exchange rates in East Asia: Implications of the Global Crisis, Conference Paper, Session 1: Trade-Led Recovery and Production Networks, *Asia-Pacific Economist's Conference Trade-Led Growth in Times of Crisis-*, Bangkok, 2-3 November
- Pholsena, S and Phonekeo. D. (2004). *Lao hydropower potential and policy in the GMS context*, United Nations Symposium on Hydropower and Sustainable Development, Beijing International Convention Centre.
- Tambunan, T (2005), Promoting Small and Medium Enterprises with a Clustering Approach: A Policy Experience from Indonesia, *Journal of Small Business Management*, Vol. 43, 2005.
- Tilman Altenburg, T., and Meyer-Stamer, J (1999), How to Promote Clusters: Policy Experiences from Latin America, *World Development*, Volume 27, Issue 9.
- World Bank. (2004). *Lao PDR Country Economic Memorandum: Realizing the Development Potential of Lao PDR*, World Bank, Vientiane.
- World Bank. (2008). *Lao PDR Economic Monitor*, World Bank, Vientiane Office.

### Appendix 1. Comparison of Lao Resource Sectors with Other Countries

Country	Resource export		Resource fiscal revenue		Per capita GDP (in US dollars)	Commodity
	In percent of total export	In percent of GDP	In percent of total fiscal revenue	In percent of GDP		
Low-income countries						
Lao P.D. R	37.4	9.1	3.7	0.4	501	Copper and gold
Mongolia	61.5	35.8	20.8	8.4	847	Copper and gold
Papua New Guinea	75.3	66.2	31.3	8.8	666	Oil, gas, copper and gold
Timor-Leste	-	109.2	79.8	72.4	353	Oil and gas
Vietnam	22.5	14.5	33.3	9	639	Oil and gas
High-and middle-income countries						
Australia	46.2	9	-	-	34381	-
Brunei	85.3	62	91.6	45.2	25976	-
Indonesia	23.1	6.8	28	5.2	1353	-
Malaysia	8.1	8.8	29.7	6.5	5126	-
Total regional average	18.5	7.3	29.4	6.3	2054	-
Low-income country average	22.9	14.7	32	9	608	-

Source: IMF (2007).



## CHAPTER 7

# **Integrating Small and Medium Enterprises into the more Integrated East Asia Region: The Case of Vietnam**

**TRAN TIEN CUONG**

**BUI VAN DUNG**

**NGUYEN THANH TAM**

**TRINH DUC CHIEU**

Central Institute for Economic Management (CIEM)

*This report presents evidence and analysis of the participation in East Asian production networks by Vietnamese Small and Medium Enterprises (SMEs), operating in the Electrical and Electronics, Automotive Components Manufacturing, and Textile and garment Industries.*

*In the context of Vietnam's WTO accession and participation in a series of free trade agreements between ASEAN and Japan, ASEAN and China, and ASEAN and South Korea, the Vietnamese SMEs have a great opportunity to join the production networks of East Asia. However, Vietnamese SMEs have not developed full awareness of, and do not pay adequate attention to, the participation in production networks in general and the East Asian production networks in particular. Vietnamese SMEs have not appreciated the benefits of participation in production networks nor considered it as a tool, a means of survival, of adding value and of improving their efficiency of utilizing their resources. The enterprises' investment of capital and human resource in this realm is still limited.*

*Also, the report indicates that during the process of entering production networks the SMEs are confronted with many obstacles which are both caused by internal factors in the enterprises, and by external factors in the business environment. Product and price are the 2 biggest obstacles for enterprises aiming to expand their production scale to meet the requirements of participation in production networks in general and East Asian production networks in particular. These obstacles result from internal factors of the businesses, such as limitations in capital, technology, and human resource, as well as a lack of market information about. External difficulties and challenges arise from the pressure of meeting the requirements of*

*foreign manufacturers or importers in the production networks, and limitations of macro-economic policies such as tariffs, technical barriers and the general business environment.*

*For SMEs to be considered as successful in production networks, the dynamism of SMEs must be not only outstanding characteristics, but also one of the determinants of business success, especially in the context of crisis and the current economic downturn. These activities bring about obvious benefits including introducing and implementing information technology networks, upgrading existing machinery or purchasing new equipment. The investment in information technology and machinery is reasonable because it will offer faster, better and more appropriate exchange of information which then helps enterprises restructure operations, reduce cost and increase profits. The dynamism of enterprises is reflected in the 2 important areas of human resources and capital; many businesses choose to self-train their workers in order to retain good workers, and, at the same time, to build a background for development after the crisis.*

*Research also shows that the success of SMEs in production networks is influenced by external factors such as the support of government and non-governmental organizations, and policies related to production and the business activities of enterprises. In recent times, many businesses have received both legal and direct support, in which financial assistance in the form of incentives for investment (tax reduction and exemption) and low interest rate loans are the most common forms of support. The support of the state and non-governmental organizations is evaluated as limited; however it has started to assist companies in setting up production networks. Measures to support enterprises in training, and improvement of the investment environment have been given more attention by government and non-governmental organizations than methods to provide information about market trends and potential customers. The survey revealed that the improvement in the investment environment for enterprises is considered to be the most effective support. Businesses also state that the investment environment has a positive impact on their processes for overcoming difficulties. In addition, support in training is appreciated by businesses for its efficiency.*

## **1. Introduction**

In the context of Vietnam's deeper integration into the world economy and especially its accession to the WTO, Vietnamese SMEs have a golden opportunity to participate in the world economy, which will involve cooperation with other domestic and foreign large-scale enterprises. However, this cooperation has just begun. Linkages between large enterprises and SMEs have been weak up to now, and are at a low level of efficiency, stemming from both large firms and SMEs. While only a small proportion of SMEs can meet the requirements of partnership with a large corporation, the rest can not satisfy customer demand due to their ineffective marketing capacity, leading to poor cooperation with other domestic and foreign large enterprises. For example, many FDI enterprises do not consider Vietnamese private businesses as potential partners and search for state-owned enterprises (Amanda Carlier and Tran Thanh Son, 2005). Several studies conducted by CIEM have examined the process of establishing networks, and the barriers to becoming a member of an East Asian production network. A study carried out by a CIEM research team within the framework of project ERIA 2007 investigated 13 electrical enterprises and 15 motorcycle enterprises, which are involved in SME production networks. That study showed that the production networks of SMEs are weak and that SMEs could not set up production networks because of the old-fashioned business practices of small-scale producers, and the existing tenuous linkages among firms. Restriction on production capacity is another obstacle to the process of becoming a member of an East Asian production network. Additionally, a research project examined the participation of Vietnamese SMEs as part of the supporting industry for Japanese FDI enterprises.

Production networks are a new issue in Vietnam. There has not been common standard definition of this term. Nevertheless, several studies and seminars have been carried out to examine the linkages between SMEs and large enterprises, the development of supporting industry, and the promotion of cooperation among businesses. Some notable research was carried out in workshops on supporting industry, held in 2008 by the Vietnam Chamber of Commerce and Industry and the Ministry of Industry and Trade's Research Institute on Industrial Strategy and Policy.

This research focused on the link between enterprises in the value chain, then proposed policies for the development of supporting industry in Vietnam. However, these studies were mainly concerned with agriculture and its supporting industry. Additionally, SMEs were the main subjects studied in the value chain, but they had not been carefully investigated in the research previously mentioned.

The study looked at 3 categories of industry, namely the automobile and motorcycle component manufacturing industry; the electrical and electronics, accessories, and electrical and electronics machinery industry; and the textile and garment industry, with the aim of comparing between countries to help researchers determine the current limitations and barriers preventing SMEs taking advantage of available resources and opportunities to survive and develop. For Vietnam, these sectors are considered to be already integrated in the international economy and have certain linkages with the new production networks of East Asia. The following passages outline information about the 3 categories of industry.

*Electrical and Electronics Industry, Accessories and Electrical and Electronics Machinery:*

Currently, there are nearly 300 electrical and electronics manufacturers consisting of 67 FDI enterprises and 10 large state-owned enterprises, with the rest being SMEs. In this industry, the FDI sector makes up a large proportion of turnover and export revenues (FDI accounts for 90% of the industry's investment capital). Domestic enterprises make up roughly two-thirds of production facilities, using approximately 60% of the workforce but this sector accounts for only 10% of the total investment capital and 10% of total export value. The majority of the supporting industry is handled by FDI enterprises. SMEs own poor production technology and mostly are assemblers. Due to the lack of indigenous research and development, the added value of the industry's outputs is small (about 10-15%) and products are of low competitiveness. Materials and components are mainly supplied by foreign suppliers (mainly imported from China, Taiwan, Japan and ASEAN countries).

#### *Automotive Parts and Components:*

The development of automotive parts and components in the last decade comes from the government's policies for attracting foreign investment and promoting domestic industry's development. Currently, there are about 600 enterprises producing and supplying spare parts for automobiles and motorcycles, of which 80 FDI companies hold the majority of market share. The participation of Vietnamese SMEs in the supply of spares, parts and components for foreign car and motorcycle manufacturers is still limited because of weak linkages, "short-sighted" production and lack of long term contracts.

In the production networks supporting the spares, parts and components sector, FDI enterprises, as major suppliers of parts, components and accessories, play a crucial role in providing essential components, and products such as machinery and electrical systems for assembly of automobiles and motorbikes. Vietnamese businesses only supply low value added components and accessories for the FDI assemblers.

#### *Textile and garment industry:*

Although Vietnam is a large textile and garment exporter (more than 9 billions USD in 2009), the Vietnamese textile and garment sector heavily depends on sub-contractual agreements. This is because Vietnam has not been able to fully control the main sources of inputs. In addition, the under-developed fashion industry and especially the small scale of supporting industry can not keep pace with the fast development of production capacity and market fluctuations. In Vietnam, the producers of major accessories such as thread, cotton fabric, studs, zips, labels and packages have the capacity to meet only a small proportion of domestic demand. The main objectives of the study are to: (i) Clarify the current situation of Vietnamese SMEs' participating in production networks; (ii) Identify and analyze barriers for SME development in general and for participating in the production networks in particular; (iii) Assess the effectiveness of measures taken by the State and other institutions to support participation in production networks, and (iv) Offer some policy recommendations to promote SMEs' participation in East Asian production networks.

The research team conducted a questionnaire survey among enterprises in different provinces and cities of Vietnam. The questionnaire was designed by ERIA to be used in

all project countries. On the basis of the outline questionnaire, the research team inserted some appropriate details related to Vietnamese enterprises' characteristics, for the purpose of investigation and interviews.

The research team selected 2 samples using simple methods: one sample comprises enterprises in 3 specific areas of Vietnam (the north, the south and the central region) and the other sample focuses on the concentration of manufacturing enterprises operating in the automobile and motorbike components, electricity, electronics, accessories, electrical and electronics machinery, and textile and garment sectors at the provincial level. Ha Noi, Hai Phong, Ho Chi Minh City, Dong Nai, and Da Nang were the localities selected for the survey. Additionally, this research project selected some enterprises operating in other sectors to compare with those in the sectors mentioned above.

The research group selected different forms of enterprises, ranging from private enterprises, limited liability companies, joint-stock companies, and foreign invested (FDI) enterprises. The various types of businesses involved should result in an accurate and impartial reflection of the state of production networks. On the basis of the questionnaire, managers of enterprises were questioned in person. Additionally, the research team simultaneously carried out in-depth interviews with some enterprises, so as to provide typical case studies.

165 enterprises were interviewed and surveyed, including 66 enterprises in textiles and garments; 29 enterprises in automotive parts, and components; 36 enterprises in electrical, and electronic parts and machinery; and 34 enterprises in other sectors. Four firms had more than 300 employees but were classified as SMEs according to the criterion of capital. The majority of interviewed firms, accounting for nearly 90% of the total were categorized as micro and small businesses. Medium-sized enterprises made up 8.5% of the sample. In accordance with the survey result, no enterprise hiring less than 6 employees even in private, limited liability or joint stock companies. Most private enterprises have fewer than 100 workers, while limited liability and 100% foreign invested companies are of larger scale. Textile and garment firms often account for large proportion of enterprises which have less than 50 employees whereas enterprises of other industries (electricity, electronics, automobiles, motorcycles) have about 6 to 200 workers.

**Table 1. Overview of Enterprises Interviewed**

		Number of interviewed enterprises	Percentage of interviewed enterprises
	<b><i>Sector</i></b>		
	Textile and garment	65	39.4
	Parts, Components, and Automotives (including motorbikes)	29	17.6
	Electrical, Electronic, parts and machinery	36	21.8
	Others	34	20.6
	No information	1	0.6
<b><i>I</i></b>	<b><i>Province/City</i></b>		
	Hai Phong	36	21.8
	Hanoi	35	21.2
	HCMC	38	23.0
	Dong Nai	31	18.8
	Da Nang	25	15.2
<b><i>II</i></b>	<b><i>Form of ownership</i></b>		
	Private company	17	10.3
	Limited liability company	70	42.4
	Joint stock company	32	19.4
	100% foreign owned Co.	40	24.2
	Joint-venture	5	3.0
	State-owned enterprises	1	0.6
<b><i>III</i></b>	<b><i>Number of employee</i></b>		
	From 1 to 5	0	0
	From 6 to 49	64	38.8
	From 50 to 99	37	22.4
	From 100 to 199	46	27.9
	From 200 to 299	14	8.5
	From 300 and above	4	2.4
	Total	165	100.0

Source: Calculated from surveyed data.

**Table 2. Distribution of SMEs by Type and Size**

Type	Number of employees						Total
	1 – 5	6-49	50- 99	100-199	200-299	>=300	
1. Textile and garment	0	28	12	18	6	2	66
2. Parts, components, and automotives (including motorbikes)	0	10	8	8	3	0	29
3. Electrical, electronic, parts and machinery	0	15	5	12	3	1	36
4. Others	0	11	12	8	2	1	34
Total	0	64	37	46	14	4	165

*Source:* Calculated from surveyed data.

**Table 3. Number of Interviewed Enterprises by Type and Scale of Labor**

	1 – 5	6-49	50- 99	100-199	200-299	300 & above	Total
Private company	0	9	6	2	0	0	17
Limited liability company	0	29	15	18	7	1	70
Joint stock company	0	13	5	13	1	0	32
100% foreign owned Co.	0	13	9	12	4	2	40
Joint-venture	0	0	2	0	2	1	5
State-owned enterprises	0	0	0	1	0	0	1
Total		64	37	46	14	4	165

*Source:* Calculated from surveyed data.

In order to analyze the collected data, the research team used a number of methods. Once data were entered and cleaned, software such as STATA and SPSS were used for analysis. The qualitative data were distributed to be analyzed together with quantitative data. Description methods, single and cross tabulations and graphs are employed to analyze the survey data. In addition to the qualitative and descriptive analysis, the team utilized quantitative analysis methods, such as binary regression, to evaluate the relationship between factors affecting SMEs' participation in production networks and their actual membership of the networks. Finally, the team matched the survey results with secondary data obtained from other surveys, or calculation results based on



common published data. The result was this review and assessment of the SMEs' process of participation in production networks.

## **2. Small and Medium Sized Enterprises in the Economy and Production Networks**

### **2.1. Concept of SME**

Before 2009, an SME in Vietnam was defined as a business establishment with registered capital of no more than Vietnam dong (VND) 10 billion (equivalent to USD 600,000) or with annual average headcount less than 300. After 8 years of application, this definition showed the following limitations. First, it does not take into consideration different types of enterprise, diverse business sectors and business scale in a wide range of sectors. Second, the use of both criteria or either of them (registered capital or annual average number of employees) reveals some limitations. As a result, some SMEs were unable to benefit from the government's assistance programs, although some still got support despite disqualification.

Recently, the Government issued Decree No.56/2009/ND-CP dated June 30, 2009 on "Supporting SME Development", which replaced Decree 90/2001/ND-CP. The definition of SMEs has been revised to conform with international practice. Accordingly, SMEs are registered business entities in accordance with law, and are categorized as micro enterprises, small enterprises and medium-sized enterprises. The criteria used to determine the categories of enterprise are total invested capital (equivalent to total assets in the balance sheet) and the annual average number of employees, of which the capital criterion is the priority. These 2 criteria can be varied according to business sector such as agriculture, forestry, fisheries, industry and construction, commerce and services. Particularly for micro enterprises, their labor is the only applied criterion, with the number of employees being than 10 persons, regardless of business sector as follows:

**Table 4. Classification of Small and Medium Sized Enterprises**

Sector \ Size	Micro enterprise	Small Enterprise		Medium enterprise	
	Number of employees	Total asset	Number of employees	Total asset	Number of employees
Agriculture, Forestry and Fishery	Less than 10 persons	Less than VND 20 billions	From 10 to 199 persons	From 20 to less than 100 billion VND	From 200 to 299 persons
Industry and Construction	Less than 10 persons	Less than VND 20 billions	From 10 to 199 persons	From 20 to less than 100 billion VND	From 200 to 299 persons
Trading and Services	Less than 10 persons	Less than VND 10 billions	From 10 to 49 persons	From 10 to less than 50 billion VND	From 50 to 99 persons

Source: Decree No. 56/2009/ND-CP.

In short, the concept of SMEs has been broadened so as to cover (i) enterprises registered under Enterprise Law, and (ii) types of enterprises such as cooperatives and individual business households. Also, the 2 criteria of invested capital and labor are adjusted in a way that is suitable for the characteristics of each industry and provisions are added so as to help produce properly oriented policies.

## 2.2. SME Development and Role in the Economy

In line with the country's economic reform and its integration in the world economy, SMEs in Vietnam have emerged and grown rapidly in terms of quantity as well as quality. According to statistics released by the Enterprise Development Agency (EDA) – Ministry of Planning and Investment, by the end of April 2009, there were 350,940 registered enterprises under the Law on Enterprises with total a registered capital of VND 1,620,787 billion, and the majority of them were SMEs.

According to the enterprise survey carried out in 2007, by 31 December 2006, the number of firms actually involved in production and trading activities in all economic sectors (except for agricultural, forestry and fishing cooperatives and individual business households) was 131,332 and the majority of them were SMEs.

**Table 5. Number of Enterprises Classified by Scale of Labor Period 2000-2007**

	2000	2001	2002	2003	2004	2005	2006	2007
Less than 5 persons	10,169	11,932	12,079	13,091	17,977	23,188	16,834	34,856
5-9 persons	10,900	13,896	18,139	20,438	26,459	34,632	57,980	51,041
10-49 persons	12,071	15,737	20,718	25,220	32,443	38,957	39,366	50,588
50-199 persons	5,633	6,304	7,541	8,531	9,808	10,933	11,683	13,333
200-299 persons	1,124	1,193	1,354	1,407	1,535	1,626	1,737	1,962
<i>Total number of SMEs</i>	<i>39,897</i>	<i>49,062</i>	<i>59,831</i>	<i>68,687</i>	<i>88,222</i>	<i>109,336</i>	<i>127,600</i>	<i>151,780</i>
300-499 persons	1,047	1,156	1,354	1,403	1,511	1,555	1,528	1,694
500-999 persons	815	883	1,043	1,181	1,203	1,188	1,259	1,283
1,000-4,999 persons	495	539	638	684	764	801	864	928
From 5,000 and above	34	40	42	57	56	70	81	86
<i>Total number of large enterprises</i>	<i>2,391</i>	<i>2,618</i>	<i>3,077</i>	<i>3,325</i>	<i>3,534</i>	<i>3,614</i>	<i>3,732</i>	<i>3,991</i>

Source: General Statistic Office.

**Table 6. Number of Enterprises Classified by Amount of Capital during the Period 2000 - 2007**

	2000	2001	2002	2003	2004	2005	2006	2007
Less than 0.5 bill. VND	16,267	18,326	18,591	18,790	23,187	26,687	15,908	18,646
0.5 – < 1 bill. VND	6,534	8,403	10,994	12,954	16,191	20,434	21,808	23,631
1 – < 5 bill. VND	10,759	14,556	20,141	24,737	32,739	41,856	63,954	72,342
5 – < 10 bill. VND	2,745	3,385	4,490	5,496	7,303	9,255	12,670	17,269
<i>Total number of SMEs</i>	<i>36,305</i>	<i>44,670</i>	<i>54,216</i>	<i>61,977</i>	<i>79,420</i>	<i>98,232</i>	<i>114,340</i>	<i>131,888</i>
10 – < 50 bill. VND	3,957	4,623	5,771	6,648	8,269	10,017	11,502	16,353
50 – < 200 bill. VND	1,515	1,781	2,160	2,491	2,904	3,302	3,837	5,286
200 – < 500 bill. VND	312	383	501	586	760	895	1,013	1,355
From 500 mill. VND	199	223	260	310	403	504	640	889
<i>Total number of large enterprises</i>	<i>5,983</i>	<i>7,010</i>	<i>8,692</i>	<i>10,035</i>	<i>12,336</i>	<i>14,718</i>	<i>16,992</i>	<i>23,883</i>

Source: General Statistic Office.

Of the 131,332 enterprises operating in late 2006, about 97% of operating enterprises employed less than 300 workers; 87.1% had registered capital of less than VND 10 billion. About 90% of registered enterprises were small and medium size, of

which more than 95% were non state-owned enterprises, while slightly less than 5% were state-owned and FDI enterprises.

Recently, SMEs have played an increasingly significant role in the national economy. SMEs have long been regarded as the main driving force behind the country's economic development and high growth rate. In 2008, the contribution of SMEs to the growth rate was 11.88%, or twice the average national growth rate of 6.18%. Also, SMEs made a great contribution to production processes, goods circulation, and provision of services linking, supporting and promoting the development of large enterprises.

In 2007, SMEs contributed more than 40% of gross domestic product (GDP) and employed nearly 4 million laborers, helping to reduce social pressure and the unemployment problem. The total value of fixed assets and long-term financial investment of these enterprises reached about VND 600 trillion, almost double compared to 2006, with a turnover of more than VND 1600 trillion.

**Table 7. Value of Fixed Assets and Long-Term Financial Investment of Enterprises**

*Unit: thousand billion VND*

Year	2000	2004	2005	2006	2007
State-owned enterprises	229.9	360.0	486.6	794.2	900.6
Non-state enterprises	33.9	147.2	196.2	298.3	591.2
FDI enterprises	147.9	237.4	269.6	337.3	390.2

*Source:* Statistic Year Book 2008.

**Table 8. Net Turnover of the Manufacturing and Trading Enterprises**

*Unit: thousand billion VND*

	2000	2004	2005	2006	2007
State-owned enterprises	444.7	708.9	838.4	961.5	1089.1
Non-state enterprises	203.1	637.4	851.0	1126.4	1635.3
FDI enterprises	162.0	374.0	468.4	596.5	735.5

*Source:* Statistic Year Book 2008.

**Table 9. Total Number of Employees in Enterprises at the Year End Annually***Unit: thousand persons*

	2000	2004	2005	2006	2007
State-owned enterprises	2088.5	2250.4	2037.7	1899.9	1763.1
Non-state enterprises	1040.9	2475.4	2979.1	3369.9	3933.2
FDI enterprises	407.6	1044.9	1220.6	1445.4	1685.9

*Source:* Statistic Year Book 2008.

### **2.3. Definition of Production Networks in Vietnam**

In this study, an SME is considered to be a member of a production network when using inputs produced by itself, or purchased from other enterprises, it (i) produces products or by-products supplied to final assemblers, and/or (ii) manufactures parts and components supplied to other enterprises at the next tier of the production chain, and/or (iii) exports its products or by products, parts and components, and/or (iv) imports raw materials or intermediate inputs, excluding the case when this SME supplies to wholesalers or retailers.

Production networks are divided into 2 types. These are “strict” production networks (named production network I), and “loose” production networks (named production network II). An SME is considered to be a member of a strict production network (production network I) when it supplies its products or by products to final assemblers (usually large machinery and equipment manufacturers, business groups, multinational companies) and/or manufactures parts and components and supplies them to first tier and second tier buyers in the production chain. The SME is considered to be a member of a loose production network (production network II) when it supplies its products or by products to final assemblers (usually large machinery and equipment manufacturers, business groups, multinational companies) and/or manufactures parts, components and supplies them to first tier, second tier and third tier buyers in the production chain, and/or exports its products or by products, and/or imports raw materials or intermediate inputs.

In 165 surveyed enterprises, about 25% (39 enterprises) can be considered as members of a production network I and the corresponding proportion in a production network II is 56% (93 enterprises). The proportions of SMEs participating in a

production network I in the textile and garment; automotive parts and components; electrical, electronic, parts and machinery; and other sectors are 13.6%, 34.5%, 36.1% and 20.6% correspondingly. The corresponding proportions in these sectors in terms of production network II are 50%, 72.4%, 63.9% and 47%.

**Table 10. Distribution of SMEs by Type, Size and Membership of a Type I Production Network**

*Unit: Number of enterprises*

Type	Production network I						Total
	1 – 5	6-49	50- 99	100-199	200-299	>=300	
1. Textile and garment		3	1	3	1	1	9
2. Parts, components, and automotives (including motorbikes)		4	3	2	1	0	10
3. Electrical, electronic, parts and machinery		5	2	4	1	1	13
4. Others		3	1	2	1	0	7
Total		15	7	11	4	2	39

*Source:* Calculated from surveyed data.

**Table 11. Distribution of SMEs by Type, Size and Membership of a Type II Production Network**

*Unit: Number of enterprises*

Type	Production network II						Total
	1 – 5	6-49	50- 99	100-199	200-299	>=300	
1. Textile and garment		17	6	7	2	1	33
2. Parts, components, and automotives (including motorbikes)		8	5	5	3	0	21
3. Electrical, electronic, parts and machinery		7	3	9	3	1	23
4. Others		5	5	5	1	0	16
Total		37	19	26	9	2	93

*Source:* Calculated from surveyed data.

## 2.4. Status of SMEs' Participation in the Production Networks

SMEs in the 3 sectors included in the research participated in production networks as supplier of inputs for other firms and consumers of inputs from other producers.

(1) SMEs are consumers of raw materials and by-products of other firms.

Table 12 describes the situation of SME participation in production networks as consumers of raw materials and by-products of other enterprises in the value chain. Survey results indicate that about two-thirds of SMEs bought raw materials from other SMEs in the same region or from other domestic suppliers. The proportion of SMEs chosen large enterprises as major suppliers was also lower than that of SMEs.

**Table 12. SMEs Buying Raw Materials or By-products From Other Enterprises**

*Unit: %*

	Supplier	Main supplier	Average distance (kms)	Average transportation time (hours)
Other local SMEs	64.0	60.8	97.5	3.1
Large enterprises	36.6	31.0	306.6	12.1
Other domestic suppliers	61.9	58.7	134.2	5.9

*Source:* Calculated from surveyed data.

The results show that Vietnam's SMEs participated in supply chains mostly with other SMEs and that the majority of SMEs did not associate with large enterprises. Most SMEs purchased materials from other SMEs in the same region to take advantage of flexibility as well as geographical location (shorter distance and transportation time). Analysis of the percentage of importing enterprises revealed that 91% of Vietnam's enterprises had imported from East Asian nations and only 18% had imported from countries in other regions in the world. Therefore, the advantage of geographical location made East Asian countries the main suppliers of materials for Vietnam's SMEs.

(2) SMEs are the suppliers of finished or by-products to other enterprises:

The results showed that the majority of interviewed enterprises had consumed products through first tier, second tier, third tier or directly provide to final assemblers. 43.9% of interviewed companies just carried out one phase of a production process, i.e. consumed products through first tier or second tier or third tier or directly supplied to final assemblers. When the 22.6% of enterprises selling via intermediaries as well as wholesalers and retailers was counted, the proportion of enterprises participating in production networks reached 66.5%. Enterprises directly delivering to the market or through wholesalers only comprised one-third of the sample.

**Table 13. SMEs Supplying Finished Products, By-products of Other Enterprises**

Characteristics and layers of supply used by surveyed enterprises	Frequency	Percent
Wholly supplying via intermediates	72	43.9
Whole/Retailers	55	33.5
Supplying via intermediates and whole/Retailers	37	22.6
Total	164	100.0

*Source:* Calculated from surveyed data.

Analysis of SMEs' participation in production networks indicates that most SMEs are suppliers to final assembling enterprises, accounting for 44.5% of all enterprises, followed by SMEs that provided to firms in the first intermediary tier (35.4%) SMEs supplying to firms in the second tier made up 4.3% and those supplying to the third tier accounted for 3.7%.

There was low proportion of enterprises participating deeply in the production networks. It can be seen that there was no enterprise only supplying the third intermediary tier and the proportion of enterprises supplying the second intermediary tier was less than 1%. Possible causes will be analyzed further in the following sections.



**Table 14. Sales Patterns Classified by the Intermediate Layers of the Enterprises***Unit: %*

	Final Assemblers	First Tier	Second Tier	Third Tier and More
No	55.5	64.6	95.7	96.3
Sale proportion less than 100%	26.2	25.6	3.7	3.7
The only method	18.3	9.8	0.6	0.0
Total	100.0	100.0	100.0	100.0

*Source:* Calculated from surveyed data.

Partners and customers of Vietnam's SMEs in the production networks are mainly other small enterprises and medium enterprises, accounting for 43.9% and 33.3% of all business partners, the remaining 22.8% of partners are large-sized enterprises. The high proportion of partners that are SMEs indicated the fairly unstable participation of Vietnam's SMEs in production networks. Developing business ties with large enterprises will enable firms to expand production scale and get support from the partnership on technology and even finance, rather than having to rely on relationships with other SMEs. The relationship amongst SMEs, as a result, reduces the potential development of production networks and may leave the firms trapped in a vicious circle of investment, production growth and consumption.

The research also examines the business partners of SMEs in production networks by analyzing the proportion of export-oriented SMEs in terms of their exporting regions within or outside East Asia. It is found that number of enterprises wholly exporting to East Asian nations made up 45% of the sample, those that export to nations outside East Asia (such as EU, USA and Australia) accounted for 31.3%, and the proportion of firms exporting to both areas comprised 23%. Hence, up to 68.8% surveyed SMEs were selling their products in East Asia. If the number of enterprises in the sample providing products to Vietnamese SMEs which then sell their goods to firms in East Asia is counted, the number of enterprises selling directly and indirectly to East Asia partners would be much higher. Apparently, Vietnam's SMEs had strong linkages with East Asian production networks, or in other words production networks in East Asia played vital role for the success of Vietnam's SMEs.

In terms of their cost structure, the share of raw material or intermediate goods costs is usually a major proportion of total cost in the surveyed enterprises. The average proportion of cost of raw materials or intermediate goods in total cost was 69.78% and 69.41% in 2007 and 2008 respectively. In 2007, this proportion for the SMEs in a production network I was only 66.02%, quite lower than the 70.17% for SMEs in production network II in 2008 the corresponding figures for the SMEs in production networks I and II were 65.31%, and 69.23% respectively.

The cost structure by sector shows that the share of raw materials/intermediate goods in the total costs of interviewed SMEs was higher in automotive parts and components, than in other sectors within surveyed sample. The shares of raw materials/intermediate goods in total costs of firms in the automotive parts and components and other sectors in 2007 were 73.02% and 71.73% respectively, whereas the corresponding shares in 2008 were 69.58% and 74.40%. The average share of raw materials or intermediate goods costs in surveyed SMEs in the textile and garment sector was lowest, at only 60.54% in 2007 and 57.34% in 2008, whereas this proportion in electrical and electronic parts and machinery was 69.98% and 70.54% in 2007 and 2008 respectively.

The average share of cost of labor for the whole surveyed sample is the second highest component of total cost. This share was 9.61% in 2007 and 12.47% in 2008. The share of labor cost is higher in the textile and garment sector because this is a labor-intensive sector, and most of the enterprises in this sector do outwork for other partners in the production chain. These characteristics also explain the relatively lower share of raw materials or intermediate goods costs in the total cost structure of textile and garment enterprises.

Electricity, fuel and water form the third significant element in the total cost of surveyed enterprises. The average proportion of cost of electricity, fuel and water in total cost was 4.78% in 2007 and 5.35% in 2008. Interest payments were lower still, at 3.40% and 3.67% in 2007 and 2008 respectively.

**Table 15. Cost Structure by Sector**

*Unit: %*

Sector and cost	2007						2008					
	Production Network I			Production Network II			Production Network I			Production Network II		
	Total	IN	OUT	Total	IN	OUT	Total	IN	OUT	Total	IN	OUT
A-Textile and garment												
1.labour cost	20.85	29.24	19.30	20.85	22.73	19.68	22.47	35.03	20.49	22.47	29.04	17.30
2. Raw materials cost	60.54	53.35	61.87	60.54	56.66	62.95	57.34	50.20	58.47	57.34	50.31	62.87
3.Utility cost	9.59	11.03	9.33	9.59	10.90	8.78	8.02	10.08	7.70	8.02	6.91	8.90
4.Interest cost	3.70	6.07	3.26	3.70	4.99	2.90	6.14	4.42	6.41	6.14	4.71	7.27
5.Other cost	5.31	0.31	6.24	5.31	4.71	5.69	6.03	0.27	6.94	6.03	9.03	3.67
Total	100	100	100	100	100	100	100	100	100	100	100	100
B-Parts, components, and automotives (including motorbikes)												
1.labour cost	7.37	10.01	6.24	7.37	7.33	7.56	9.20	13.82	6.63	9.20	9.25	8.96
2. Raw materials cost	73.02	67.61	75.72	73.02	73.30	71.63	69.58	66.43	71.33	69.58	69.34	70.92
3.Utility cost	6.50	7.33	6.08	6.50	6.84	4.82	7.48	3.41	9.74	7.48	7.79	5.72
4.Interest cost	2.27	0.41	3.19	2.27	2.27	2.27	2.59	1.49	3.76	2.95	3.06	2.30
5.Other cost	10.85	14.64	8.96	10.85	10.27	13.72	10.79	14.84	8.54	10.79	10.56	12.10
Total	100	100	100	100	100	100	100	100	100	100	100	100
C-Electrical, Electronic, parts and machinery												
1.labour cost	8.31	8.39	8.24	8.31	7.63	12.48	11.85	16.04	9.58	11.85	10.73	18.54
2. Raw materials cost	69.98	65.29	73.41	69.98	70.03	69.67	70.54	63.73	74.21	70.54	70.06	73.38
3.Utility cost	3.00	1.31	4.23	3.00	2.53	5.90	3.75	1.82	4.80	3.75	3.96	2.50
4.Interest cost	3.84	4.52	3.35	3.84	3.24	7.56	3.69	5.34	2.81	3.69	3.57	4.41
5.Other cost	14.88	20.49	10.77	14.88	16.58	4.38	10.17	13.07	8.61	10.17	11.68	1.17
Total	100	100	100	100	100	100	100	100	100	100	100	100
D-Others												
1.labour cost	11.21	7.24	13.29	11.21	10.32	12.01	11.41	6.72	13.42	11.41	10.07	12.50
2. Raw materials cost	71.73	74.63	70.21	71.73	72.79	70.78	74.40	80.90	71.61	74.40	77.79	71.64
3.Utility cost	8.75	4.90	11.70	8.75	3.09	12.20	8.87	1.81	11.90	8.87	3.96	12.86
4.Interest cost	2.23	2.12	2.65	2.23	1.43	2.34	1.78	1.02	2.11	1.78	1.78	1.78
5.Other cost	6.08	9.87	2.14	6.08	13.61	2.67	3.54	9.55	0.96	3.54	6.39	1.22
Total	100	100	100	100	100	100	100	100	100	100	100	100

### **3. Barriers to SME Development**

#### **3.1. Constraints for SMEs in General**

SMEs faced obstacles when participating in production networks, some caused by the SMEs themselves while others resulted from external factors, out of their control. Realizing the importance of obstacles and barriers will help firms to make a precise assessment of each type of obstacle. Therefore, the study involved interviews with SMEs intended to enable researchers to clarify various types of obstacle. The internal obstacles are informational barriers, functional barriers, product and price barriers, and distribution, logistics and promotion barriers. External obstacles are procedural barriers, business environment barriers, tax, tariff and non-tariff barriers, and other barriers.

The 8 barriers mentioned above are divided into 38 detailed barriers and were assessed at 5 levels of significance, from very significant to not significant. Based on the responses given, the 10 most significant barriers ranked by SMEs were defined for the whole sample, and for SMEs inside and outside production networks I and II. For all firms surveyed, offering competitive prices to customers is the most significant “barrier” for SMEs. The remaining significant barriers in descending level of impact were: shortage of working capital to finance new business plans, difficulty in matching competitors' prices, difficulty in getting credit from suppliers and financial institutions; poor or deteriorating economic conditions in the home market, insufficient quantity of and/or untrained personnel for market expansion, unfamiliarity with complexity of procedures or paperwork, lack of home government assistance or incentives, lack of production capacity to expand, and participation in promotional activities to target markets or business partners.

**Table 16. Ranked Top-ten Constraints Faced by SMEs**

All Sample	Production Network I		Production Network II	
	IN	OUT	IN	OUT
B14. Offering competitive prices to customers	B7. Shortage of working capital to finance new business plan	B14. Offering competitive prices to customers	B7. Shortage of working capital to finance new business plan	B14. Offering competitive prices to customers
B7. Shortage of working capital to finance new business plan	B28. Poor/deteriorating economic conditions (Foreign market)	B15. Difficulty in matching competitors' prices	B15. Difficulty in matching competitors' prices	B15. Difficulty in matching competitors' prices
B15. Difficulty in matching competitors' prices	B23. Unfamiliarity with complexity of procedures/paperwork	B7. Shortage of working capital to finance new business plan	B14. Offering competitive prices to customers	B7. Shortage of working capital to finance new business plan
B8. Difficulty in getting credit from suppliers and financial institutions	B14. Offering competitive prices to customers	B8. Difficulty in getting credit from suppliers and financial institutions	B8. Difficulty in getting credit from suppliers and financial institutions	B8. Difficulty in getting credit from suppliers and financial institutions
B28. Poor/deteriorating economic conditions (Home market)	B15. Difficulty in matching competitors' prices	B28. Poor/deteriorating economic conditions (Home market)	B5. Insufficient quantity of and/or untrained personnel for market expansion	B28. Poor/deteriorating economic conditions (Home market)
B5. Insufficient quantity of and/or untrained personnel for market expansion	B5. Insufficient quantity of and/or untrained personnel for market expansion	B5. Insufficient quantity of and/or untrained personnel for market expansion	B23. Unfamiliarity with complexity of procedures/paperwork	B2. Unreliable market data (costs, prices, market shares)
B23. Unfamiliarity with complexity of procedures/paperwork	B6. Lack of production capacity to expand	B25. Lack of home government assistance/incentives	B28. Poor/deteriorating economic conditions (Home market)	B25. Lack of home government assistance/incentives
B25. Lack of home government assistance/incentives	B28. Poor/deteriorating economic conditions (Home market)	B23. Unfamiliarity with complexity of procedures/paperwork	B25. Lack of home government assistance/incentives	B22. Participation in promotional activities to target markets/business partners
B6. Lack of production capacity to expand	B8. Difficulty in getting credit from suppliers and financial institutions	B6. Lack of production capacity to expand	B6. Lack of production capacity to expand	B9. Developing new products
B22. Participation in promotional activities to target markets/business partners	B22. Participation in promotional activities to target markets/business partners	B2. Unreliable market data (costs, prices)	B28. Poor/deteriorating economic conditions (Foreign market)	B37. Willingness to adopt new business strategy or ideas

(1) The results revealed that product and price are the biggest barriers hindering Vietnam's SMEs from expanding production and meeting requirements when participating in production networks in general and East Asian production networks in particular. Generally, the SMEs' weaknesses relating to financial resource, human resources, and technology are the constraints limiting their ability to meet requirements for product and price. Clearly, the close cohesion of a network requires the businesses in the network to adopt uniform standards of quality of products and price.

In order to develop new products, enterprises typically have 2 options. The first is to buy products from other suppliers - possibly by buying products and marketing under their own brand, or possibly producing under license. The second option is developing

a product by themselves via R & D (research and development). For SMEs with limited financial and human resources, new product development is a real challenge. Survey results show that up to 64.5% of enterprises said that developing new products is a barrier, of which 16.4% said that this barrier is large and significant. Product quality is reflected in 2 main criteria: meeting technical standards and product design. Using these criteria, product quality is also a considerable barrier for Vietnam's SMEs. 66.5% and 64.5% of businesses find it difficult to meet the 2 criteria. However, packaging and labeling products is not seen as a considerable obstacle for Vietnam's SMEs.

The development of new products was seen as more difficult by domestic SMEs than by the FDI SMEs. With better technology and human resources, especially with the continuity and guidance of the parent companies, developing new products in house is not a barrier for FDI SMEs. In contrast, domestic SMEs, whether private enterprises or limited liability and joint-stock companies, find that this is a difficult task, though at slightly different levels.

Electrical and electronic sectors often require a huge investment in capital, technology and particularly in human resources when developing new products. Although in the past the number of electrical and electronic training centers increasing rapidly, focusing primarily on information technology, they generally do not meet the SMEs' requirements in quantity or quality. Therefore, obstacles facing enterprises producing electrical and electronic components and accessories are greater than in other sectors such as textile and garment, and automotive parts and motorcycles.

Many exporting enterprises, especially in the garment sector, have not developed or designed new products because of their focus on producing and processing products. The product development duty is often taken by overseas partners. Therefore, exporting enterprises encounter fewer difficulties than other businesses in developing new products. Vietnam's textile and garment enterprises are usually 100% exporters, so that developing new products is not a big problem. However, the value added in garment products is relatively low.

**Table 17. Barriers to Developing New Products by Sector, Ownership and Nature of Export**

*Unit: %*

	Not significant	Little	Moderate	Significant	Very significant
<i>By sector</i>					
Textile and garment	37.5	23.4	26.6	10.9	1.6
Parts, Components, and Automotives (including motorbikes)	41.4	13.8	31.0	10.3	3.4
Electrical, Electronic, parts and machinery	36.1	19.4	13.9	27.8	2.8
Others	26.5	20.6	41.2	11.8	0.0
<i>By ownership</i>					
Private enterprise	11.8	41.2	29.4	17.6	0.0
Limited liability Co.	33.3	24.6	24.6	14.5	2.9
Joint-stock company	37.5	15.6	25.0	21.9	0.0
100% FDI enterprise	50.0	10.0	35.0	2.5	2.5
<i>By market</i>					
Domestic only	32.1	20.2	27.4	17.9	2.4
Export only	40.9	27.3	22.7	9.1	0.0
Both markets	38.6	17.5	29.8	12.3	1.8

*Source:* Calculated from surveyed data.

Vietnam's SMEs can meet the requirements of quality, packaging, and design, but find that it is very difficult to compete with other enterprises in terms of price. Up to one-third of SME responses show that price is either significant or very significant for them when approaching customers.

Table 18 describes problems of price between different businesses groups. Results show no significant difference between the groups, except for FDI enterprises, which report a lower level of difficulty. Remaining enterprise groups find it difficult to offer a price competitive with other businesses, even with imported goods. A \$12.5 billion trade deficit in 2009 proved somewhat the weak price competition ability of Vietnam's SMEs.

**Table 18. Barriers to Offering Competitive Prices to Customers by Sector, Ownership and Nature of Export**

*Unit: %*

	Not significant	Little	Moderate	Significant	Very significant
<i>By sector</i>					
Textile and garment	16.9	26.2	23.1	27.7	6.2
Parts, Components, and Automotives (including motorbikes)	27.6	17.2	17.2	20.7	17.2
Electrical, Electronic, parts and machinery	13.9	27.8	27.8	13.9	16.7
Others	17.6	17.6	32.4	14.7	17.6
<i>By ownership</i>					
Private enterprise	17.6	17.6	29.4	17.6	17.6
Limited liability Co.	14.3	21.4	27.1	25.7	11.4
Joint-stock company	18.8	31.3	18.8	25.0	6.3
100% FDI enterprise	27.5	22.5	27.5	7.5	15.0
<i>By market</i>					
Domestic only	15.3	22.4	28.2	22.4	11.8
Export only	18.2	22.7	27.3	18.2	13.6
Both markets	22.8	26.3	17.5	19.3	14.0

*Source:* Calculated from Surveyed Data.

(2) The second most significant constraint for SMEs when participating in production networks is the shortage of working capital to finance their new business plans. Despite significant recent change, lack of capital and credit access has been serious problems reported in all surveys recently. The proportion of enterprises reporting a shortage of capital in this study was 77.4%, of which 34.8% see this as a significant or very significant barrier. Especially in 2008, due to the tightening monetary policy of the Government, access to credit for enterprises in general and SMEs in particular was very limited. Although in 2009 policy has been loosened, due to the economic recession and downturn many businesses still have problems in terms of capital. Moreover, because of the domino effect, access to credit from suppliers is virtually impossible.



**Table 19. Shortage of Working Capital to Finance New Business Plans by Sector, Ownership and Nature of Export**

*Unit: %*

	Not significant	Little	Moderate	Significant	Very significant
<i>By sector</i>					
Textile and garment	17.2	10.9	28.1	32.8	10.9
Parts, components, and automotives (including motorbikes)	27.6	20.7	13.8	24.1	13.8
Electrical, electronic, parts and machinery	30.6	16.7	33.3	13.9	5.6
Others	20.6	20.6	26.5	17.6	14.7
<i>By ownership</i>					
Private enterprise	23.5	17.6	17.6	29.4	11.8
Limited liability Co.	15.9	15.9	27.5	26.1	14.5
Joint-stock company	18.8	18.8	31.3	25.0	6.3
100% FDI enterprise	32.5	12.5	30.0	17.5	7.5
<i>By market</i>					
Domestic only	19.0	15.5	28.6	23.8	13.1
Export only	27.3	18.2	27.3	22.7	4.5
Both markets	26.3	14.0	24.6	24.6	10.5

*Source:* Calculated from Surveyed Data.

The entities which had most difficulty in accessing credit sources were domestic SMEs. The proportion of these enterprises facing a credit problem was higher than among FDI SMEs. One possible explanation is that FDI SMEs received support from parent companies overseas, while domestic SMEs had to survive on their own. Moreover, due to the nature of small-scale and old-established business practice, transparency in the financial accounting books is low. Thus, access to capital from financial institutions for these enterprises was rather difficult.

While electrical and electronic SMEs face small difficulty in access to credit financing for new projects (only 19.5%), spares, parts and components SME producers, particularly textile and garment SMEs, face many of difficulties. For automotive and motorcycle SMEs, because of the sector downturn, difficulty in access to credit is understandable, but for the textile and garment SMEs, this is a surprising finding. Although the world economy is generally declining, Vietnam's textile and garment

sector still achieved a good growth rate, with more than \$ 9 billion in exports in 2009<sup>1</sup>, a similar result to 2008. This issue should be studied further in additional research to develop an adequate explanation.

Exporting SMEs found it easier to find financial resources for new business projects, due to their better capacity and trustworthiness in the implementation of new projects than domestic SMEs.

**Table 20. Difficulty in Getting Credit from Suppliers and Financial Institutions by Sector, Ownership and Nature of Export**

*Unit: %*

	Not significant	Little	Moderate	Significant	Very significant
<i>By sector</i>					
Textile and garment	26.6	17.2	23.4	20.3	12.5
Parts, Components, and Automotives (including motorbikes)	20.7	17.2	24.1	27.6	10.3
Electrical, Electronic, parts and machinery	33.3	25.0	19.4	19.4	2.8
Others	23.5	17.6	32.4	20.6	5.9
<i>By ownership</i>					
Private enterprise	23.5	23.5	11.8	35.3	5.9
Limited liability Co.	21.7	20.3	27.5	20.3	10.1
Joint-stock company	25.0	15.6	18.8	31.3	9.4
100% FDI enterprise	35.0	17.5	32.5	10.0	5.0
<i>By market</i>					
Domestic only	26.2	21.4	16.7	25.0	10.7
Export only	27.3	31.8	22.7	13.6	4.5
Both markets	26.3	10.5	36.8	19.3	7.0

*Source:* Calculated from surveyed data.

(3) The next significant constraint on the participation of SMEs in production networks is the difficulty of matching competitors' prices. Identifying the necessary information for production and business activities is still a barrier for SMEs, especially information about market and potential business partners. 14.5% of SMEs believed that it was moderate or considerable hindrance. Although 14.5% was not a large number,

<sup>1</sup> <http://www.vietnamtextile.org/ChiTietTinTuc.aspx?MaTinTuc=1342&Matheloai=5>

that figure reflected the currently non-transparent dissemination of information. Market information may seem easy to obtain, but its accuracy and reliability are hard to verify.

Because Vietnamese SMEs face many difficulties in accessing sources of information, especially information relating to markets and competitors, and also because the reliability and accuracy of the information may not be high; SMEs reported difficulty in matching competitors' prices. Most companies only know the prices of competitors within a large range, and this not helps in the process of offering prices and securing customers.

Among the diverse sources of information such as books, the Internet, trade fairs, exhibitions, the trade representatives of Vietnam in foreign countries, and service providers, Vietnam's SMEs usually have access to the available sources of mass media, i.e. to books and the Internet. Some SMEs do participate in trade fairs or exhibitions. Survey results demonstrated that a large proportion of SMEs (about 60%) considered (lack of) information as a hindrance at different levels from low to moderate, considerable, or even tremendous. 70.1% of SMEs had problems with the trustworthiness of information, 57.9% of SMEs had encountered problems with contact information and communication with potential business partners.

Table 21 describes in detail how SMEs access information about potential business partners, analyzed by sector and nature of the market (i.e. domestic or export market). Results showed that the FDI SMEs seem to find more difficulty in accessing this information than do domestic SMEs. This can be explained by the fact that FDI enterprises come from a foreign business environment, therefore they lack a thorough understanding of partners like Vietnamese companies, even though FDI enterprises may have better financial resources for funding this activity.

**Table 21. Inability to Identify and Contact Potential Business Partners by Sector, Ownership and Market Characteristics**

*Unit: %*

	Not significant	Little	Moderate	Significant	Very significant
<i>By sector</i>					
Textile and garment	50.0	18.8	17.2	12.5	1.6
Parts, Components, and Automotives (including motorbikes)	34.5	27.6	17.2	20.7	0.0
Electrical, Electronic, parts and machinery	47.2	22.2	16.7	13.9	0.0
Others	29.4	29.4	26.5	14.7	0.0
<i>By ownership</i>					
Private enterprise	35.3	29.4	23.5	11.8	0.0
Limited liability Co.	40.6	24.6	20.3	14.5	0.0
Joint-stock company	50.0	18.8	15.6	12.5	3.1
100% FDI enterprise	42.5	20.0	17.5	20.0	0.0
<i>By market</i>					
Domestic only	45.2	26.2	16.7	10.7	1.2
Export only	13.1	2.4	6.0	4.8	0.0
Both markets	23.8	16.7	13.1	14.3	0.0

*Source:* Calculated from surveyed data.

FDI SMEs find that access to information on price is not as difficult to obtain as domestic SMEs do. Textile and garment enterprises also encounter fewer difficulties when carrying out diversification. Meanwhile, exporting enterprises face more difficulties due to matching the price.

**Table 22. Difficulty in Matching Competitors' Prices by Sector, Ownership and Nature of Export**

*Unit: %*

	Not significant	Little	Moderate	Significant	Very significant
<i>By sector</i>					
Textile and garment	20.0	27.7	24.6	23.1	4.6
Parts, Components, and Automotives (including motorbikes)	25.0	14.3	14.3	25.0	21.4
Electrical, Electronic, parts and machinery	19.4	22.2	19.4	27.8	11.1
Others	20.6	23.5	29.4	17.6	8.8
<i>By ownership</i>					
Private enterprise	17.6	29.4	23.5	29.4	0.0
Limited liability Co.	12.9	27.1	27.1	25.7	7.1
Joint-stock company	29.0	12.9	19.4	29.0	9.7
100% FDI enterprise	32.5	20.0	20.0	10.0	17.5
<i>By market</i>					
Domestic only	17.9	21.4	22.6	29.8	8.3
Export only	27.3	22.7	27.3	13.6	9.1
Both markets	22.8	24.6	22.8	17.5	12.3

*Source:* Calculated from surveyed data.

(4) Difficulty in getting credit from suppliers and financial institutions is considered as the fourth most important constraint for Vietnamese SMEs. Lack of capital and credit access has been serious problems in all surveys recently. The proportion of enterprises having a shortage of capital in this study is 77.4%, of which 34.8% say that this is a significant or very significant problem. The corresponding proportions of enterprises finding it difficult to access credit are 73.8% and 29.8% respectively. Although in 2009 monetary policy of the Government was loosened, many businesses still had problems in terms of capital due to the economic downturn. Moreover, because of the domino effect, access to credit from suppliers is virtually impossible. The survey result shows that difficulty in getting credit from suppliers and financial institutions is the second most significant barrier to Vietnam's SMEs amongst 5 specified difficulties in functional barriers, ranked right behind the shortage of working capital financing new business plans. (See Appendix II).

Similarly to the problem of getting funds for new projects, the ability to obtain credit in general from financial institutions -banks, credit institutions and suppliers- is different across the enterprises. FDI SMEs report that they experience more difficulty than domestic SMEs. However, when considering different types of business, the proportion of textile and garment SMEs having difficulty was only 32.8%, while the highest proportion is 37.9% in the automotives parts and components, (including motorbikes) sector. Thus, the difficulty in generating capital for business expansion in textile and garment SMEs may result from an intrinsic difficulty of the sector, resulting, perhaps from labor or market aspects of the business. Exporting SMEs also find it easier to access credit than domestic SMEs.

(5) The fifth constraint on SMEs becoming members of production networks is the poor or deteriorating economic condition of the home market.

Poor or deteriorating economic conditions, along with inadequacy of basic and IT infrastructure, and political instability are the 3 main barriers to business environment. However, Annex II shows that 9.7% of enterprises concluded that the basic and information technology infrastructure of the domestic market form significant or very significant barriers, and 10.4% of enterprises thought that those of foreign markets were significant or very significant barriers. On the other hand, Vietnam is seen as politically stable, as only 1.6% of enterprises said that political stability is an obstacle to their performance. Additionally, a small number of surveyed SMEs (about 10%) considered the business environment as a significant and very significant barrier. This once again proves that Vietnam is considered as an attractive investment location for many enterprises from all over the world.

Nonetheless, due to the huge impact of the economic downturn, 20% of enterprises reported that difficult economic conditions in Vietnam were an obstacle for the expansion and development of enterprises. This constraint is also a barrier to the participation of SMEs in production networks and was ranked as the fifth most significant by the SMEs surveyed.

(6) The sixth obstacle to the participation in production networks of Vietnam's SMEs, as reported by the enterprises surveyed, is insufficient quantity of and/or untrained personnel for market expansion.

Although its national population ranks 13th in the world, the proportion of trained workers that meet their requirements is small, so that SMEs have difficulty in recruiting the workers they need for production and market expansion. The table below shows that labor is still a barrier to development of many SMEs in Vietnam. 26.6% of respondents said that the lack in quantity and quality of available labor is an obstacle. This proportion is higher than a recent survey of SMEs (John Rand, 2007), which reported similar views from 18.8% of respondents. In the present survey, 69.1% of SMEs believe that the labor problem can be seen in varying degrees, 52.7% of SMEs consider this problem as moderate, and 26.6% of SMEs say that it is significant or very significant, and heavily influences the business activities and market expansion in general of their enterprises.

**Table 23. Functional Barriers**

*Unit: %*

	Not significant	Little	Moderate	Significant	Very significant
Lack of managerial time to identify new business opportunities	37.2	28.7	26.8	6.1	1.2
Insufficient quantity of and/or untrained personnel for market expansion	30.9	16.4	26.1	23.6	3.0
Lack of production capacity to expand	29.7	27.3	21.8	15.8	5.5
Shortage of working capital to finance new business plan	22.6	15.9	26.8	23.8	11.0
Difficulty in getting credit from suppliers and financial institutions	26.2	18.9	25.0	21.3	8.5

*Source:* Calculated from surveyed data.

Analysis of the labor barrier over various types of SMEs shows that domestic SMEs report more labor difficulties than FDI SMEs. While only 12.5% of FDI SMEs consider the quantity and quality of labor to be a serious or very serious obstacle, non-FDI SMEs had a different experience. Among joint-stock companies and limited liability companies the proportions reporting serious or very serious labor shortages were 30% and 31.3% respectively. For private enterprises, this proportion even reached 41.2%.

Although they do not require such highly qualified workers as electrical, electronics or motorcycle manufacture, SMEs surveyed in the textile and garment sector have the biggest difficulties with labor issues. It is the fact that textile and garment workers are currently not plentiful, especially in cities. About a dozen years ago, the garment export sector attracted many unskilled workers in major cities; but recently the emergence of many new city jobs with more comfortable working conditions or higher incomes have generated a shift of workers from the garment sector to the new sectors. The survey results show that up to 32.3% of enterprises had significant difficulty.

**Table 24. Barriers of Insufficient Quantity of and/or Untrained Personnel for Market Expansion by Sector, Ownership and Nature of Export**

*Unit: %*

	Not significant	Little	Moderate	Significant	Very significant
<i>By sector</i>					
Textile and garment	20.0	21.5	26.2	<b>30.8</b>	<b>1.5</b>
Parts, Components, and Automotives (including motorbikes)	37.9	17.2	27.6	17.2	0.0
Electrical, Electronic, parts and machinery	41.7	11.1	22.2	22.2	2.8
Others	35.3	11.8	29.4	14.7	8.8
<i>By ownership</i>					
Private enterprise	29.4	17.6	11.8	29.4	11.8
Limited liability Co.	22.9	20.0	27.1	27.1	2.9
Joint-stock company	40.6	3.1	25.0	31.3	0.0
100% FDI enterprise	40.0	22.5	25.0	12.5	0.0
<i>By market</i>					
Domestic only	29.4	14.1	34.1	21.2	1.2
Export only	27.3	27.3	13.6	27.3	4.5
Both markets	35.1	14.0	19.3	26.3	5.3

*Source:* Calculated from surveyed data.

In contrast to informational barriers, exporting SMEs appear to face more difficulties in human resource issues than many other SMEs. These difficulties result from the high requirements in terms of product quality of its partners and customers, as well as the requirement for skilled employees. Domestic SMEs, on the other hand, are in less trouble. The proportions of domestic SMEs and exporting SMEs who reported



human resources as a considerable or tremendous obstacle were 22.4% and 31.8% respectively.

(7) The seventh most significant barrier to SMEs' participation in production networks is lack of familiarity with the complexity of procedures or paperwork required.

Over the past few years Vietnam has carried out considerable administration reform programs at local and national levels. The administrative procedures of ministries and sectors have been revised and published in the mass media. These procedures are supposed to be cut back, especially those relating to the production and trading activities of enterprises in general and SMEs in particular. A typical example is that business registration time is reduced from months to weeks or even 5 to 7 days. In some places, the time taken to issue business registration certificates and other related legal documents even takes only 3 days. Therefore, most enterprises do not consider administrative procedures as a significant or very significant barrier to their business activities. Only 17.2% of enterprises considered that not being familiar with procedural processes was a significant or very significant barrier to their businesses.

**Table 25. Difficulties in Accessing Support and Promotion from Local Governments by Sector, Ownership and Nature of Export**

*Unit: %*

	Not significant	Little	Moderate	Significant	Very significant
<i>By sector</i>					
Textile and garment	26.2	26.2	24.6	20.0	3.1
Parts, Components, and Automotives (including motorbikes)	20.7	27.6	27.6	13.8	10.3
Electrical, Electronic, parts and machinery	34.3	34.3	14.3	11.4	5.7
Others	23.5	26.5	29.4	14.7	5.9
<i>By ownership</i>					
Private enterprise	11.8	29.4	41.2	11.8	5.9
Limited liability Co.	33.3	30.4	20.3	13.0	2.9
Joint-stock company	31.3	15.6	25.0	21.9	6.3
100% FDI enterprise	20.0	27.5	27.5	17.5	7.5
<i>By market</i>					
Domestic only	29.8	27.4	25.0	13.1	4.8
Export only	9.1	31.8	31.8	18.2	9.1
Both markets	28.1	28.1	19.3	19.3	5.3

*Source:* Calculated from surveyed data.

Recently, the Government of Vietnam has required its ministries and provincial people's committees to publicize their administrative procedures, and to revise and remove inappropriate procedures and regulations. The simplification and publicity of administrative procedures should be completed by 2011. This has led to a notable improvement in the procedural aspect in the past few years, and unfamiliarity with complexity of procedures or paperwork only ranked as the seventh constraint for SMEs in this survey when participating in production networks.

(8) The eighth barrier to the participation of SMEs in production networks is the lack of home government assistance or incentives.

The picture here is similar to the assessment of SMEs of procedures and paperwork. SMEs face some difficulties at different levels with settlement of contract disputes, unfavorably local regulations and difficulties in export markets, however these difficulties are not seen as being as severe as difficulties with complicated procedural processes or difficulties in getting support from indigenous authorities at different levels.

Although there has been administrative reform, with policies being announced to make it easier to conduct business activities, 21.4% of responses said that local authorities at different levels had not provided effective assistance and stimulation programs for enterprises. Support for FDI SMEs seems to be less than that given to domestic SMEs. This is an interesting point, as, in order to attract FDI investment, local authorities normally have direct support policies for enterprises, on issues connected with tax and land. However, this stimulation may be less than their expectations, or the development has not been well integrated. Thus the opinion of FDI enterprises is that these difficulties are negative, and these views are stronger than the opinions of domestic enterprises, who also received less support from local authorities than they wanted.

The survey also shows that exporting SMEs received more support and stimulation than domestic enterprises. This probably resulted from the preference for exporting enterprises over domestic enterprises, in the mindset of the authorities.

(9) Lack of production capacity to expand is considered as one of the top ten constraints for SMEs wanting to be members of production networks in the East Asia region, and is ranked ninth in significance. Possible reasons could include the fact that

the Vietnamese textile and garment sector depends heavily on sub-contractual agreements, and therefore is not able to fully control its main sources of inputs. In addition, the under-developed fashion industry, and especially the small scale of supporting industry, can not keep pace with the fast development of production capacity, nor with market fluctuations. In Vietnam, the producers of major accessories such as thread, cotton fabrics, studs, zips, labels and packages have the capacity to meet only a small proportion of domestic demand. Therefore, the large proportion of main inputs as fiber, fabric and accessories including thread and zip are imported.

Even though the automotive market size is quite small in Vietnam, there are 14 companies producing and assembling motor vehicles. Therefore, it is difficult for any of these companies to expand their domestic market share. In addition, due to limitations in production capacity, Vietnamese SMEs have faced many problems (e.g. meeting quality requirements from foreign partners) when participating in production networks in the automotive sector as a supporting partner. Due to the limited capacity of domestic SMEs, joint-venture companies often call for cooperation from foreign partners, which in turn reduce the scope of Vietnamese SMEs wishing to become subcontractors.

The electrical and electronics sectors often require a huge investment in capital, technology and particularly in human resources when developing new products. Although in the past the number of electrical and electronics training centers has increased rapidly, focusing primarily on information technology, they generally do not meet the industry's requirements in quantity or quality. Therefore, obstacles facing enterprises producing electrical and electronic components and accessories are greater than in other sectors, such as textiles and garments, automotive and motorcycles.

(10) The last of the top ten constraints for Vietnam's SMEs participating in production networks is the need for promotional activities, to target markets or business partners.

According to respondents' reports, and due to the complexity of production chains, activities such as seeking new partners, maintaining relationships and ensuring partner's trust in the production chain are still notable hindrances, both for SMEs and for policy makers. Recently, the Government and local authorities have undertaken numerous promotional activities, with the participation of many enterprises. However,

SMEs still think that promotion activities, directed towards seeking new markets and business partners, are obstacles for them. They say that the participation of enterprises in government promotion programs is not effective and that they have to carry out their promotional work. On the other hand, the effectiveness of their search for business partners depends not only on promotion activities but also on the enterprises' own ability and prestige.

According to the survey, FDI SMEs face more difficulties than private domestic SMEs in accessing information, as well as taking part in promotion activities and seeking new markets and business partners. Up to 30% of FDI SMEs considered these difficulties as significant and very significant whereas the equivalent number for private SMEs is 5.9%, for limited companies is 11.5% and for joint-stock companies is 18.8%. It is not surprising to find such a high figure among FDI SMEs because the government's promotion programs are designed to benefit domestic enterprises.

**Table 26. Difficulty in Promoting Market and Business Partner by Sector, Ownership and Nature of Export**

*Unit: %*

	Not significant	Little	Moderate	Significant	Very significant
<i>By sector</i>					
Textile and garment	26.2	35.4	23.1	13.8	1.5
Parts, Components, and Automotives (including motorbikes)	31.0	24.1	17.2	27.6	0.0
Electrical, Electronic, parts and machinery	31.4	28.6	25.7	11.4	2.9
Others	23.5	32.4	32.4	8.8	2.9
<i>By ownership</i>					
Private enterprise	17.6	47.1	29.4	0.0	5.9
Limited liability Co.	26.1	42.0	20.3	10.1	1.4
Joint-stock company	37.5	21.9	21.9	18.8	0.0
100% FDI enterprise	25.0	15.0	30.0	27.5	2.5
<i>By market</i>					
Domestic only	27.4	40.5	20.2	10.7	1.2
Export only	31.8	13.6	27.3	22.7	4.5
Both markets	26.3	24.6	28.1	19.3	1.8

*Source:* Calculated from surveyed data.

Despite receiving support from numerous trade promotion programs in the industry, automotive and motorcycle parts and component manufacturers face a variety of difficulties in expanding their market size and finding new customers. Exporting-oriented enterprises, because of the fierce competition in the international market, require more support than domestic enterprises. The percentage of exporting enterprises in the survey who considered promotion as a significant or great barrier was 27%, higher than that of domestic enterprises, which was 12%.

At the present time, there are not many enterprises producing cars and motorcycles in Vietnam, but the majority of automotive spares, parts and components manufacturers find it difficult to access potential business partners. It can be seen that the obstacles are not only caused by the scale of the market, but also by the ability of SMEs to satisfy the detailed and stringent requirements of the production networks.

**Box 1: Access to market information and the client of VIEBA company**

VIEBA is an enterprise specialized in manufacturing woolen garments, with 95% of the company's products exported to the EU and USA, and the remaining 5% consumed in the domestic market. To serve the foreign partners' requirements for high-quality products, VIEBA must import raw materials from China and other countries. Their sources of information are mainly through the company's main channels: the office of the parent company located abroad, representatives in other countries, and the Internet.

The company is based in Pho Noi Industrial Zone, Hung Yen province. In that industrial zone, there are many other firms, one of which is funded by Spanish investment capital, and is specialized in producing yarn. Despite their location in the same zone, VIEBA and the Spanish company have no information about each other. Therefore, the 2 companies could not make contact, nor have they provided products to each other.

Although VIEBA intended to find producers of domestic textile materials, they found it very difficult to locate sources of information. Even where they did find information, the information was not guaranteed to be reliable and accurate.

### **3.2. Distinctions Between SMEs Inside and Outside-Production Networks**

Analysis the 38 specified barriers at 5 levels of significance indicates that shortages of working capital to finance new business plans was the most significant barrier to SMEs in production networks I and II. In contrast, the need to offer competitive prices

to customers was ranked as their most important barrier by SMEs outside production networks I and II. The competitive prices barrier is the third most significant in production network II and the fourth most significant in production network I. The barrier ranking levels are different between SMEs inside and outside production networks I and II. (See more detailed in Table 16)

It is quite clear that there is a distinction between SME inside and outside production networks. As members of a production network, SMEs have to invest in new projects accompanied by new business plans set by the companies, with whom they are under contract, as well as to maintain and improve linkage within the production networks. As a result, new investment capital, especially working capital is needed. However, working capital is usually one of the big problems faced by SMEs, therefore the shortage of working capital to finance new business is considered as one of the top ten obstacles for SMEs in production network I and production network II. SMEs outside both production network I and production network II, are not under pressure on new investments and new business plans set by other companies, and only focus on producing and selling their products. Hence these SMEs concern themselves mainly with sales, therefore offering competitive prices to customers is ranked as their most significant constraint. Another possible reason for considering this as a constraint for their business activities is that without participating in production networks, these SMEs face more difficulty in selling their products.

The results obtained show that there are quite big differences in reported significant constraints between SMEs inside and outside the production networks, apart from the quantity and/or quality of personnel for market expansion, (similarly ranked by SMEs inside and outside production network I,) and the difficulties they experienced in matching competitors' prices and in getting credit from suppliers and financial institutions, all of which were similarly ranked by SMEs inside and outside production network II.

The following are the next most significant constraints for SMEs in type I production networks:

(i) For SMEs in a type I production network, external factors such as poor or deteriorating economic conditions in foreign markets, and unfamiliarity with the complexity of procedures or paperwork are more important than those constraints

relating to internal factors. In contrast, internal barriers, such as offering competitive prices to customers, difficulty in matching competitors' prices, insufficient quantity and/or quality of personnel for market expansion, and lack of production capacity for expansion are reported as having less impact on SMEs inside production networks. Possible reasons might be the high proportion of SMEs with import activities (53.9%), export activities (47.9%) and foreign investors (24.2%) in the surveyed sample. Due to the global economic crisis, the import and export activities of Vietnam's SMEs are heavily depressed. In other words, poor or deteriorating economic conditions in foreign markets is considered as a big constraint for SMEs. Similarly, unfamiliarity with complexity of procedures or paperwork is also assessed as one of the major obstacles for SMEs. Although much reform in administrative procedures has been carried out in Vietnam in recent years, nearly 77% of surveyed SMEs claimed that unfamiliarity with complexity of procedures or paperwork was a barrier ranked as a significant or very significant constraint by 17.2% of respondents.

(ii) SMEs outside type I production networks are affected by both internal barriers (such as difficulty in matching competitors' prices, shortage of working capital to finance new business plans, insufficient quantity and/or quality personnel for market expansion, and lack of production capacity to expand) and external barriers (such as difficulty in getting credit from suppliers and financial institutions, poor or deteriorating economic conditions in the home market, lack of home government assistance or incentives, unfamiliarity with complexity of procedures or paperwork, and unreliable market data).

There are differences and similarities between SMEs in- and outside type I production networks. A difference is that SMEs in a type I production network are strongly affected by external barriers while the impact of these barriers on SMEs outside a production network I is not as great. A similarity between SMEs in- and outside a type I production network is that all of them face human resource difficulties, that is the insufficient quantity and/or quality of personnel for market expansion. The level of significance of this factor for both types of SMEs is the same and it is ranked as the sixth most important constraint.

The distinction amongst SMEs in- and outside type II production networks is examined below:

(i) According to the responses of SMEs in type II production networks, internal barriers seem to be more significant constraints than external barriers. Internal barriers, such as difficulty in matching competitors' prices, offering competitive prices to customers, and insufficient quantity and/or quality of personnel for market expansion are considered greater constraints than unfamiliarity with the complexity of procedures or paperwork, poor or deteriorating economic conditions in the home market, and lack of home government assistance/incentives. This situation in type II production networks contrasted with the case of production networks type I. This reflects the nature of SMEs in the two types of production network. SMEs in type I production networks supplied their products or by products to final assemblers and/or manufactured parts and components and supplied them to first tier and second tier buyers in the production chain. SMEs in type I production networks supplied their products or by products to final assemblers and/or manufactured parts and components and supplied them to first tier, second tier and third tier buyers in the production chain, and/or exported their products or by products, and/or imported raw materials or intermediate inputs. Due to the loose characteristics of type II production networks, constraints for SMEs seem to be less related to external factors than those in type I production networks. This seems to imply that the production capacity of Vietnam's SMEs in type II production networks is not sufficient to produce and supply their products, by products, parts or components to different partners in the production chain, including final assemblers, manufacturers of parts or components supplying the first tier, second tier and third tier buyers in the production chain, or export their products.

(ii) For SMEs outside type II production networks, the first five most significant constraints are the same as those of SMEs outside type I production networks. From the most to the least significant, their constraints are; offering competitive prices to customers, difficulty in matching competitors' prices, shortage of working capital to finance new business plans, difficulty in getting credit from suppliers and financial institutions, and poor or deteriorating economic conditions in the home market.

However, when comparing SMEs in- and outside type I production networks, there is a big difference in the ranking level of constraints. The 3 most significant constraints for SMEs outside the production networks are; offering competitive prices to customers, difficulty in matching competitors' prices, and shortage of working capital to finance



new business plans. These are all internal barriers. This demonstrates that, due to the lack of required production capacity when becoming a member of a type II production network these SMEs cannot participate in the production networks. The constraints ranked lower were; difficulty in getting credit from suppliers and financial institutions, poor or deteriorating economic conditions in the home market, unreliable market data (costs, prices, market shares), and lack of home government assistance or incentives. These are all external barriers. The results show that although external barriers have a certain impact on SMEs when participating in production networks, internal barriers are the dominant determinants driving the participation of SMEs in type II production networks.

The significance of insufficient quantity and/or quality of personnel for market expansion is another noticeable difference between SMEs in- and outside type II production networks. Only SMEs in type II networks find insufficient quantity and/or quality of personnel for market expansion to be a big obstacle (ranked the fifth most significant constraint), while SMEs outside a type II production network ranked it eleventh. This finding indicates that the low quality of employees is a significant constraint for SMEs when participating in production networks.

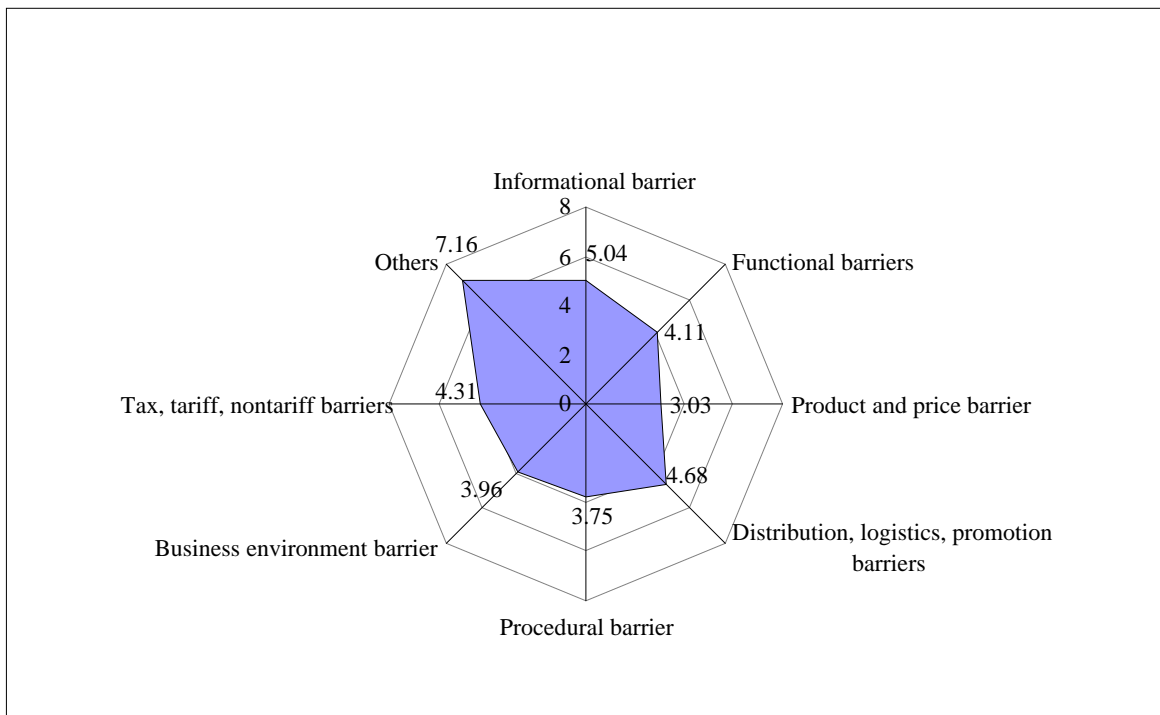
When analyzing the 8 barriers to SME development for the whole sample, product and price barriers were the most difficult obstacles. The next most significant barriers (from high to low) are: procedural barriers; business environment barriers; functional barriers; tax, tariff, non-tariff barriers; distribution, logistics, promotion barriers; informational barriers; and other barriers. Product and price barriers are also ranked as most difficult by SMEs in type I and II production networks, and by SMEs outside type I networks. Functional barriers are the second most significant to SMEs in type I networks but only ranked as the third most significant barrier to SMEs in type II networks. This means that functional barriers have greater impact on SMEs in type I networks than those in type II networks. The second most significant barrier for all firms, and for SMEs in type I and II networks and outside type II networks is the procedural barrier. Despite the considerable recent progress in administrative reform, enterprises considered this factor as a hindrance to their development. Although the business environment has been much improved in recent years, it still seems to be a barrier to SMEs, who rank it as the third most significant barrier, except for SMEs in

type II networks (who ranked it fifth). Tax and tariff policy itself seems not to be a big constraint on development, but customs procedures are still a matter of business concern, whereas distribution, logistics and promotion tend to become potential barriers. (See more detail in Table 27).

**Table 27. Ranked Constraints by Category Faced by SMEs**

All Sample	Production Network I		Production Network II	
	IN	OUT	IN	OUT
product and price barrier	product and price barrier	product and price barrier	product and price barrier	product and price barrier
procedural barrier	functional barrier	procedural barrier	procedural barrier	procedural barrier
business environment barrier	business environment barrier	business environment barrier	functional barrier	business environment barrier
functional barrier	procedural barrier	functional barrier	tax, tariff, nontariff barrier	functional barrier
tax, tariff, nontariff barrier	tax, tariff, nontariff barrier	tax, tariff, nontariff barrier	business environment barrier	distribution, logistics, promotion barrier
distribution, logistics, promotion barrier	distribution, logistics, promotion barrier	distribution, logistics, promotion barrier	distribution, logistics, promotion barrier	tax, tariff, nontariff barrier
informational barrier	informational barrier	informational barrier	informational barrier	informational barrier
other barrier	other barrier	other barrier	other barrier	other barrier

**Figure 1. General Assessment of Enterprises on Barriers**



#### **4. Critical Factors for the Success of SMEs in Production Networks**

This section will analyze in detail the elements that affect the participation of Vietnam's SMEs in production networks. The determinants of the success of SMEs in production networks are those factors that help the SMEs to increase their production capacity, such as meeting international standards, introducing ICT, establishment of new divisions or new plants, attending or becoming involved in business associations, buying new machines or facilities with new functions, improving existing machines, equipment or facilities, and introducing new know-how in production methods.

Results from the survey show that the proportion of SMEs in production networks using methods for improving business processes or organizations in the past 3 years, or adopting a new production method, is higher than that of the SMEs outside production networks. This is compatible with the finding obtained from the in-depth interview carried out by the research team, that SMEs participating in production networks are

those enterprises that had established new divisions or new plants, introduced new know-how in production methods, met international standards, or introduced ICT.

**Table 28. Methods of Improving Business Processes for SMEs in Production Networks**

*Unit: %*

	Frequency (%) by status in production network	
	IN production network	OUT production network
Met international standards	66.7	45.7
Introducing ICT	63.6	54.5
Established new divisions or new plants	75.6	50.0
Attended/involved in business associations, etc.	59.6	52.1
Bought new machines or facilities with new functions	59.8	51.5
Improved existing machines, equipment, or facilities	60.6	50.0
Introduced new know-how on production methods	67.3	52.6

Analyzing the distance from the production sites of SMEs to ports shows the following interesting picture. SMEs in production networks are located mostly within 1 hour to 2 hours of travel, or from 30 Km to 45 Km from a port (39.8%), while SMEs located more than 2 hours from ports accounted for 33.3%, and the rest, nearly 17%, located near ports (less than 0.5 hours) or moderately near (0.5 hours to less than 1 hour). Note that the travel time from enterprises to ports may be quite long due to low quality of infrastructure. The location of SMEs outside production networks varies considerably.

**Table 29. Distance from Surveyed SMEs to Ports***Unit: %*

	IN production network	OUT production network
<b><i>By time</i></b>		
Near port (less than 0.5 hours)	8.6	19.4
Moderately near (from 0.5 to less than 1 hour)	18.3	32.8
Moderately far (from 1 to less than 2 hours)	39.8	23.9
Far (more than 2 hours)	33.3	23.9
Total	100	100
<b><i>By distance</i></b>		
Near port (less than 10Km)	8.6	17.6
Moderately near (between 10 and less than 30Km)	28.0	44.1
Moderately far (between 30 and less than 45Km)	26.9	23.5
Far (from 45 and more than 45Km)	36.6	14.7
Total	100	100

This research also examines the sources of working capital and production expansion capital for SMEs in and outside production networks, and makes a comparison between these 2 types of SME. Table 30 shows that most of SMEs in Vietnam, including both SMEs in production networks and SMEs outside production networks, use retained earnings for working capital and production expansion capital. The proportion of SMEs using bank loans for working capital and production expansion capital is quite high, at 38.7% and 40.3% respectively. The relatively high ratio of Vietnam's SMEs using bank loans for working capital and production expansion capital seems to be a result of the implementation of fair business environment policies, as well as the SME promotion policies of the government. In the case of SMEs participating in production networks, the ratio of enterprises using other sources (government concession/subsidized loan, suppliers, money lenders, personal savings, and relatives) is relatively high compared with those used by SMEs outside production networks. This reflects the fact that SMEs' participation in production networks has been being paid more attention by the government, financial institutions, and suppliers, as well as by the SMEs in production networks themselves.

**Table 30. Funding Source of SMEs***Unit: %*

	IN production network	OUT production network
<b><i>Working capital</i></b>		
Retained earnings	98.9	98.6
Banks	38.7	40.3
Other financial institutions	7.5	9.7
Others (government assistance, informal sources)	40.9	25.0
<b><i>Capital expansion</i></b>		
Retained earnings	98.2	97.2
Banks	16.1	22.2
Other financial institutions	2.2	2.8
Others (government assistance, informal sources)	21.5	16.7

This section will also analyze the internal and external factors that affect the participation Vietnam's SMEs in production networks. Elements examined include internal one such as dynamic characteristics, trade features, participation or not in industrial zones and even external elements such as the support of the government and non-governmental organizations, and policy mechanisms.

#### **4.1. Internal Factors**

The dynamism of SMEs is both their characteristic and one of the elements that determines the success of enterprises, especially in the context of the current economic crisis and decline. Dynamism is shown not only in short term activities but also in strategic and long term activities such as investment in information technology, and satisfaction of international standards.

Table 31 shows that the effectiveness of methods varies among enterprises. Tangible results from these activities are the introduction and development of information technology networks, and buying or upgrading new machines and equipment. This is reasonable, since investment in information technology would help information to be transferred better and faster. As a result, enterprises should be able to

reform their operations, reduce expenses and raise profits. This is demonstrated by the fact that the proportion of enterprises in the survey which invested in information technology, and made profits in 2007 and 2008 amounted to 81.8% and 87.9% respectively. These figures are higher than those relating to enterprises which did not invest in information technology where the corresponding figures are 68.9% in 2007 and 62.9% in 2008. However, the proportion of enterprises investing in information technology through building websites is quite low. Only 45.3% of enterprises have websites, 4.1% intend to have one in the future and the remaining 50.6% do not have one and do not intend to build one<sup>2</sup>. Therefore, it would be better to have stronger and more effective support for enterprises in applying information technology to business activities.

Although buying new machines may be risky, enterprises did so as a means of increasing production efficiency. That statement is proved in reality when the proportion of enterprises which invested in new machines made higher profit than that of enterprises without new investment in machines. The percentage of these two groups is 74.2% and 72.2% in 2007, and 67.6% and 62.8% in 2008 respectively.

---

<sup>2</sup> <http://dddn.com.vn/200912160456821cat67/50-doanh-nghiep-chua-su-dung-website.htm>

**Table 31. The Effectiveness of Business Operations in 2007 and 2008***Unit: %*

		Performance result in 2007			Performance result in 2008	
		Loss	Break even	Profitable	Loss	Profitable
Met international standards	Yes	24.7	2.5	72.8	30.9	69.1
	No	28.6	1.2	70.2	33.3	66.7
Introduced ICT and reorganized business processes	Yes	28.8	2.3	68.9	37.1	62.9
	No	18.2	0.0	81.8	12.1	87.9
Established new divisions or new plants	Yes	27.4	2.4	70.2	32.3	67.7
	No	24.4	0.0	75.6	31.7	68.3
Attended/involved in business associations, cooperation with other firms, R&D networks, trade fairs, etc.	Yes	23.9	2.8	73.2	31.0	69.0
	No	28.7	1.1	70.2	33.0	67.0
Bought new machines or facilities with new functions to operation	Yes	30.9	1.5	67.6	38.2	61.8
	No	23.7	2.1	74.2	27.8	72.2
Improved existing machines, equipment, or facilities	Yes	33.3	1.7	65.0	40.0	60.0
	No	23.1	1.9	75.0	27.9	72.1
Introduced new know-how on production methods	Yes	27.2	0.9	71.9	32.5	67.5
	No	26.5	4.1	69.4	32.7	67.3

*Source:* Calculated from surveyed data.

The influence of participation in enterprise associations, collaborating with other enterprises, taking part in research and development networks, and trade fairs, on the effectiveness of enterprise operations is not very clear. The proportion of enterprises which did not carry out these activities but still made profit in 2007 and 2008 is even slightly higher than enterprises that did.

Calculations show that the proportion of enterprises carrying out new investment to meet international standards and making profit in 2007 and 2008 is smaller than the proportion of enterprises that did not invest. Establishing a new department or factory seems not to bring much immediate effectiveness. Because they are long-term investments, it is hard to say that these investments are ineffective. It takes time to judge the effectiveness of these activities. The dynamism of enterprises is shown on 2 important aspects: human resource and capital. In the context of the current state of the



economy, many enterprises have chosen to carry out a wide range of labor training. On the one hand, firms know that they can retain their laborers; on the other hand they need to create the basis for development after the recession. The survey results indicate that this is a correct decision. The proportion of enterprises which had labor training expenses, and made a profit in 2008, though slightly down compared to 2007, was higher than the proportion of those who did not have training expenses. There is a similar pattern in the data distinguishing between enterprises which had external capital mobilization and those which did not. In the case of loan capital, the pressure to pay interest and repay the principle force enterprises to become dynamic, resulting in better production and trading, and more effective participation in production networks. Therefore, in this situation, taking out loans is a good choice for enterprises.

**Table 32. The Relationship between Training Costs, Capital Mobilization and Efficient Production Network Participation**

*Unit: %*

		Performance result in 2007			Performance result in 2008	
		Loss	Break-even	Profitable	Loss	Profitable
Training cost	No	30.8	2.6	66.7	34.6	65.4
	Yes	23.2	1.2	75.6	30.5	69.5
Outside capital mobilization	No	32.0	1.3	66.7	38.7	61.3
	Yes	22.2	2.2	75.6	26.7	73.3

*Source:* Calculated from surveyed data.

The research team also used a Binary Logistic Regression model and the Cox & Snell R Square and Nagelkerke R Square tests to assess the relationship between the nature of an SME's business, location inside and outside an industrial zone and the extent of its participation in production networks. The dependent is binary variable with one (1) if products sold to whole/retailers and zero (0) if products sold to other types of buyers (final assemblers, first tier, second tier, and third tier). The 2 tests showed that the model has the confidence level of 95%. The estimated coefficients in the model are shown in Table 33.

**Table 33. Testing the Correlation between Type of Business and the Level of Production Network Participation**

		Variables in the Equation					
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 <sup>a</sup>	Textile and garment			7.422	3	.060	
	Parts, Components, and Automotives (including motorbikes)	-1.792	.659	7.389	1	.007	.167
	Electrical, Electronic, parts and machinery	-.203	.428	.225	1	.635	.816
	Other	-.192	.440	.190	1	.663	.825
	Constant	-.368	.250	2.157	1	.142	.692

a. Variable(s) entered on step 1: Sector.

The testing result of estimated coefficients in the model displays negative estimated coefficients of parts, components and automotives (including motorbikes); electrical, electronic, parts and machinery; and others. This means that enterprises operating in garment and textile sector are likely to sell their products to whole/retailers than those enterprises in other interviewed sectors. However, only estimated coefficient of parts, components and automotives (including motorbikes) shows significant difference at any reasonable confidence interval, the other estimated coefficients are insignificant. The result also shows that the probability of enterprises which sold their entire product to whole/retailers in parts, components and automotives is only about 0.2 times compared to those enterprises in textile and garment sector.

Using a similar model, the research team also investigated the relationship between the location of enterprises (inside or outside an industrial zone) and the probability of their participation in a production network. The testing result of the Cox & Snell R Square and Nagelkerke R Square showed a confidence level of 95%. Estimated coefficients from Binary Logistic Regression model are reported in Table 34.

**Table 34. Testing the Correlation between the Location of the Business and the Level of Production Network Participation**

		Variables in the Equation					
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 <sup>a</sup>	Within the industrial zones	1.375	.430	10.207	1	.001	3.953
	Constant	-1.705	.384	19.673	1	.000	.182

a. Variable(s) entered on step 1: Q12\_bzone.

The result shows that at any reasonable level of significance, the probability of enterprises located outside an industrial zone selling their entire output to wholesalers and retailers is 4 (3.953) times higher than for those inside an industrial zone. It can be said that enterprises which locate inside an industrial zone tend to collaborate and participate in production networks, unlike those outside an industrial zone.

#### **4.2. External Factors**

Along with the internal elements of enterprises, the research team also analyzed the impact of external elements, such as support of the government and non governmental organizations, policies toward the production and trading activities of enterprises in general, and the effectiveness of production network participation in particular.

In order to help enterprises, including SMEs, in production and trading activities, Vietnam has undertaken many programs as aimed supporting and developing the enterprise community. Research on access to assistance programs recently indicated that many enterprises received support from these programs (Rand, 2007). Common supporting programs are financial assistance in the form of investment incentives (reduced tax and tax exempt) and loans (low interest bearing).

The survey results reveal the views of the SMEs on the support given by the Government and non governmental organizations to the business performance of enterprises. Tables 35, 36, 37 show the current situation of SMEs accessing supporting measures provided by the Government and non-governmental organizations. In general, a large proportion of enterprises accesses supporting measures at different levels. The highest proportion of enterprises used support related to information,

training, and improvement in the investment environment. Results were 50.3%, 42.4% and 42.4% respectively. This demonstrates that supporting measures such as training and improving the investment environment are of more interest to the Government and non governmental organizations than supplying information about markets and potential customers. This result from the fact that collecting and supplying information about markets and potential customers is rather difficult, not only for SMEs but also for governmental agencies and non governmental organizations.

Turning to important support such as consultancy, technology transfer and collaboration to form business networks, only about 20% of enterprises used these, whereas one-third of enterprises took advantage of financial support.

**Table 35. Accessing to Supporting Measures from the Government and Non-government Organizations**

*Unit: %*

Types of supports	Yes	No
Training	42.4	57.6
Counseling and advice	19.4	80.6
Technology development and transfer	17.6	82.4
Market information	50.3	49.7
Business linkages and networking	26.7	73.3
Financing	37.0	63.0
Overall improvement in investment climate	42.4	57.6

*Source:* Calculated from surveyed data.

The comparison of difference types of enterprise showed the proportion of FDI enterprises which had access to financial support was smaller than that of domestic enterprises, at 17.5%, whereas the lowest proportion of domestic private enterprises was 35.3%. A higher proportion of joint-stock companies had accessed supporting measures than other types of enterprises. Private enterprises also had the lowest proportion accessing technology transfer support, at 11.8%. This means that only 1 in 10 enterprises had the benefit of this support, which is half that of limited liability companies and joint-stock companies.

**Table 36. Accessing Supporting Measures of the Government and Non-governmental Organizations Classified by Ownership**

*Unit: %*

Types of supports	Private enterprise		Limited liability Co.		Joint-stock company		100% FDI enterprise	
	Yes	No	Yes	No	Yes	No	Yes	No
Training	35.3	64.7	41.4	58.6	50.0	50.0	45.0	55.0
Counseling and advice	17.6	82.4	17.1	82.9	28.1	71.9	17.5	82.5
Technology development and transfer	11.8	88.2	20.0	80.0	21.9	78.1	12.5	87.5
Market information	52.9	47.1	50.0	50.0	53.1	46.9	47.5	52.5
Business linkages and networking	23.5	76.5	24.3	75.7	37.5	62.5	22.5	77.5
Financing	35.3	64.7	42.9	57.1	50.0	50.0	17.5	82.5
Overall improvement in investment climate	52.9	47.1	35.7	64.3	46.9	53.1	45.0	55.0
Others	0.0	100.0	1.4	98.6	3.1	96.9	2.5	97.5

*Source:* Calculated from surveyed data.

The research team also noted that textile and garment enterprises had the lowest proportion accessing supporting measures, compared to automotive and motorcycle parts and components producers, and electrical and electronic enterprises. The proportion of these enterprises that had access to consultancy support was 12.3%, 13.8% and 30.6% respectively. The proportion of textile and garment enterprises accessing technology transfer support was only 7.7%, much lower than the proportion of automotive and motorcycle parts and components manufacturers, which was 20.7%, or electrical and electronic enterprises, which was 30.6%. Textile and garment enterprises had only a slightly better access to financial support than automotive and motorcycle parts and components producers.

**Table 37. Accessing Supporting Measures of the Government and Non-governmental Organizations Classified by Types of Business**

*Unit: %*

Type of supports	Textile and garment		Parts, Components, and Automotives		Electrical, Electronic, parts and machinery		Other	
	Yes	No	Yes	No	Yes	No	Yes	No
Training	35.4	64.6	41.4	58.6	50.0	50.0	50.0	50.0
Counseling and advice	12.3	87.7	13.8	86.2	30.6	69.4	26.5	73.5
Technology development and transfer	7.7	92.3	20.7	79.3	30.6	69.4	20.6	79.4
Market information	41.5	58.5	58.6	41.4	58.3	41.7	52.9	47.1
Business linkages and networking	23.1	76.9	27.6	72.4	33.3	66.7	26.5	73.5
Financing	38.5	61.5	37.9	62.1	38.9	61.1	35.3	64.7
Overall improvement in investment climate	33.8	66.2	44.8	55.2	58.3	41.7	41.2	58.8
Others	1.5	98.5	3.4	96.6	2.8	97.2	0.0	100.0

*Source:* Calculated from surveyed data.

Although enterprises received support from the government, other organizations and made their own efforts, due to the recent economic recession, the proportion of enterprises making profit in 2008 was lower than in 2007. However, more detailed analysis is needed to assess the impact of support to enterprises in their production and trading processes and the effectiveness of production network participation. The research team did an in-depth analysis of how effective it was. Enterprises were also asked about the usefulness of the support that they had received.

For the whole sample, the most efficient assistance to SMEs was information on markets, including the complexity of production networks and buyers' technology. This was increasingly available through ICT-based facilities, as well through traditional mechanisms such as trade fairs, exhibitions, and visits/tours. The next most significant kinds of assistance were financing, overall improvement in the business climate, training, business linkage and networking, counseling or advice, technology development and transfer, and other assistance.

Information is also ranked as the most efficient assistance to SMEs in both types of production network, whereas training services and financing are the most efficient

assistance to SMEs outside the type I production networks and type II production networks respectively. Information is only ranked as the fourth most efficient assistance to SMEs outside type I production networks. Overall improvement in business climate ranked as the second most efficient assistance to SMEs participating in both types of production network, and to SMEs outside type II production networks, The second most efficient assistance to SMEs outside type I production networks is counseling or advice. Training service is ranked the third most significant assistance to SMEs in both types of production network and SMEs outside type II production networks, whereas the third most significant assistance to SMEs outside type I production networks is technology development and transfer. The financing, business linkage and networking, counseling or advice, technology development and transfer supports are ranked from the fifth to seventh in effectiveness, depending on whether the SMEs is in- or outside a production network.

**Table 38. Perception of Assistance**

All Sample	Production network I		Production network II	
	IN	OUT	IN	OUT
information	information	training	information	financing
financing	overall improvement in business climate	counseling/advice	overall improvement in business climate	overall improvement in business climate
overall improvement in business climate	training	technology development and transfer	training	training
training	business linkage and networking	information	financing	financing
business linkage and networking	financing	business linkage and networking	business linkage and networking	business linkage and networking
counseling/ advice	counseling/ advice	financing	counseling/ advice	counseling/ advice
technology development and transfer	technology development and transfer	overall improvement in business climate	technology development and transfer	technology development and transfer
other	other	other	other	other

The results also show that the continuous supply of market information (including about production networks and their complexity, customers and technology) through modern means (e.g. Internet) as well as through traditional means (participating in trade fairs, exhibitions, and excursions) received the highest appreciation from the enterprises surveyed. This appreciation corresponded with the difficulties that they met when trying to obtain useful, reliable sources of information.

Although financial support may have limitations, enterprises showed a high level of appreciation for loan and tax support. Especially during the recent economic downturn, support such as interest rate reduction by 4%, business income tax, and value added tax rescheduling or reduction received support from enterprises'. Many enterprises were rescued by the support measures of the government. However, as shown above, financial support measures need more encouragement if they are to bring effectiveness to enterprises' operations. At present, although there is high proportion of enterprises that had access to major financial support, cumbersome procedures limited this measure's effectiveness.

The survey result shows that support relating to the improvement of the investment environment is an effective measure. Enterprises also reported that the investment environment was favorable for them during the period of maximum difficulty. This is consistent with the above-mentioned analysis that the investment environment is not a serious obstacle to enterprise performance.

According to the enterprises surveyed, training was also seen as an effective support measure whereas technology transfer was not. Although technology is a weak point for Vietnamese enterprises, technology transfer was assessed as the least effective support measure. This shows that support from the government and non-governmental organizations on this aspect are limited. Many technologies transferred were not suitable, and were even obsolete for the enterprises' needs.



**Table 39. Assessing the Effectiveness of Supporting Measures of the Government and Non-governmental Organizations**

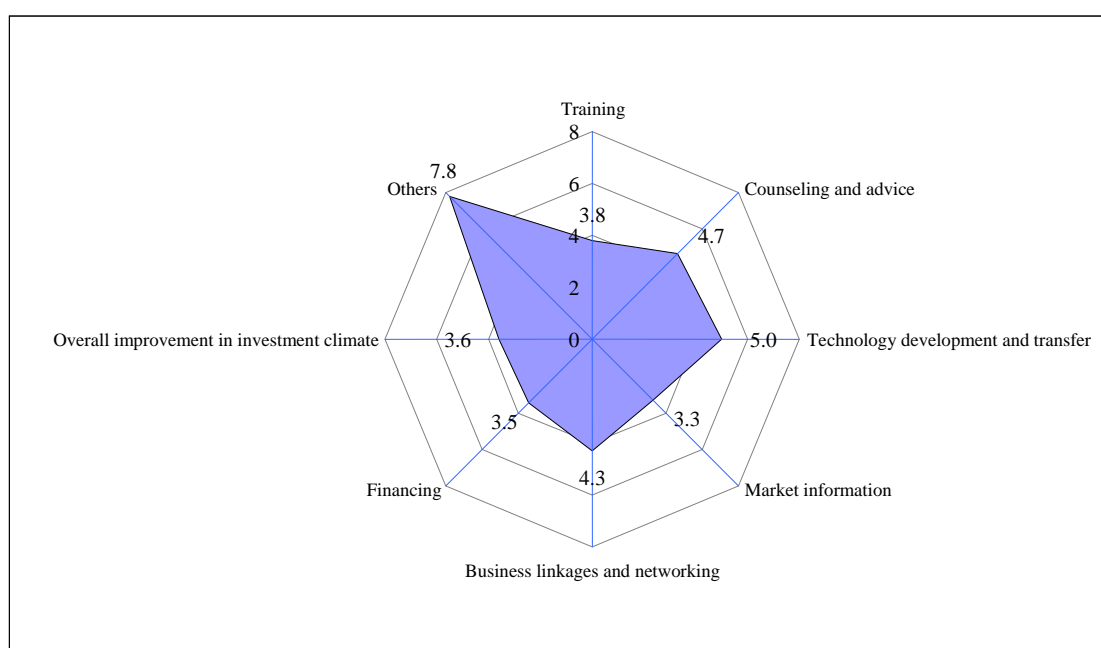
*Unit: %*

Type of supports	Very effective	Effective	Moderate	Less effective	Not at all
Training	7.1	50.0	42.9	0.0	7.1
Counseling and advice	0.0	45.2	51.6	3.2	0.0
Technology development and transfer	0.0	32.1	60.7	7.1	0.0
Market information	9.6	43.4	44.6	2.4	9.6
Business linkages and networking	4.7	30.2	60.5	4.7	4.7
Financing	0.0	16.4	42.6	31.1	0.0
Overall improvement in investment climate	10.0	48.6	38.6	2.9	10.0

*Source:* Calculated from surveyed data.

The effectiveness of support in relation to linkages and the formation of production networks did not receive high appreciation from the enterprises surveyed. The reason for this may be that too much expectation was put on the support of the Government, while in fact what was received was limited. Enterprises should realize that it is up to them to participate in the production networks.

**Figure 2. Evaluation of Supporting Measures for SMEs**



**Table 40. Relationship between Access to Support from the Government and Other Organizations and Production Efficiency in 2007 and 2008**

*Unit: %*

	Performance result in 2007			Performance result in 2008	
	Loss	Break-even	Profitable	Loss	Profitable
Training	22.9	2.9	74.3	31.4	68.6
Counseling and advice	22.6	6.5	71.0	29.0	71.0
Technology development and transfer	17.9	7.1	75.0	32.1	67.9
Market information	19.3	3.6	77.1	24.1	75.9
Business linkages and networking	15.9	4.5	79.5	34.1	65.9
Financing	17.7	3.2	79.0	25.8	74.2
Overall improvement in investment climate	22.9	4.3	72.9	27.1	72.9

*Source:* Calculated from surveyed data.

Enterprises of different ownership types had different views on the level of importance and effectiveness of supporting measures. FDI enterprises were mostly interested in the investment environment, in training and then in business network formation and linkage. These enterprises when deciding to invest in Vietnam really need information on the investment environment, law and government policies. They also need the support of the Government and non governmental organizations on business network formation and linkage, such as participation in industrial clusters and industrial zone investment. Meanwhile, for private enterprises, due to their lack of capital and financial resources, financial assistance was the most effective method of support. Information support for private enterprises was not as useful as for joint-stock and limited liability companies.

**Table 41. Assessing the Effectiveness of Supporting Measures for SMEs by Ownership**

*Unit: point<sup>3</sup>*

Type of supports	Private enterprise	Limited liability Co.	Joint-stock company	100% FDI enterprise
Training	3.3	4.0	3.6	3.6
Counseling and advice	4.4	5.0	4.4	4.4
Technology development and transfer	4.9	5.1	5.0	5.1
Market information	4.2	3.1	3.0	3.8
Business linkages and networking	4.8	4.4	4.6	3.6
Financing	2.7	3.0	3.7	4.5
Overall improvement in investment climate	3.8	3.6	4.1	3.3
Others	7.9	7.8	7.6	7.8

*Source:* Calculated from surveyed data.

Enterprises in different business sectors had different evaluations of the impact of supporting measures and their levels of effectiveness in helping them overcome difficulties. In Table 42, textile and garment enterprises reported that support in finance, information, and training was most effective for them. These were certainly the measures they were most interested in. The automotive and motorcycle parts and components manufacturers cared more about information, the investment environment and financial resources, while electrical and electronic enterprises paid more attention to information, the investment environment, and training. The order of interest may vary among enterprises but information is generally the most issue of most concern, and this is the most effective area of support for the enterprises' production and trading activities. Accurate, timely and trustworthy information is extremely useful for these enterprises.

<sup>3</sup> Rating from 1 to 8, where 1 is the most efficient measure and 8 is the least efficient measures.

**Table 42. Assessing the Effectiveness of Supporting Measures for SMEs by Type of Business**

*Unit: point*

Type of supports	Garment	Parts, Components, and Automotives	Electrical, Electronic, parts and machinery	Other
Training	3.6	3.9	3.9	3.8
Counseling and advice	4.8	4.8	4.5	4.4
Technology development and transfer	5.2	5.2	4.5	5.1
Market information	3.2	3.3	3.0	4.0
Business linkages and networking	4.6	3.9	4.5	4.0
Financing	3.0	3.7	4.1	3.4
Overall improvement in investment climate	3.9	3.4	3.7	3.4
Others	7.7	7.8	7.7	7.9

*Source:* Calculated from surveyed data.

## **5. Suggestions for Stimulating Enterprises to Participate in Production Networks**

### **5.1. On the Government Agency Side**

The survey shows that information is the crucial element for the enterprises' development of their production and trading processes. Currently, access to information is always useful for enterprises though it still has limitations. The effectiveness of supporting programs is low. Therefore, in future, the Government should diversify sources of information, such as enhancing the function and effectiveness of Vietnamese trade missions abroad, establishing an integrated information system, to include basic general information about enterprises, such as name, type of business, address etc. Amongst these measures, the government should establish an updated database of

information on Vietnam's SMEs. It could then provide such information in support of those SMEs competent to become members of production networks, to final assemblers, FDI enterprises, suppliers and importers. This information would enable enterprises to find business partners more easily. The survey also demonstrates the need for improvement in the government's trade promotion programs. The government should do more detailed work, for example by carrying out trade promotion programs in subjects such as textiles and garments, electrical and electronic parts and components, and the automotive sector; promoting business linkages between domestic SMEs and FDI enterprises. At the same time, the number of participating enterprises should not be limited.

Technology transfer is the "hot" issue, and directly impacts on the success of enterprises in production networks. Despite receiving a lot of encouragement from the Government, this issue has not received proper attention. Procedures need to be simplified so that enterprises could access more technology transfer support programs. In addition, technology trade fairs should be expanded in order to help enterprises to access suitable and appropriate sources of information.

Another clear point is the need for stronger programs to raise the quality of human resource. Insufficient quantity and/or quality or training of personnel is one of the big constraints for Vietnam's SMEs wishing to participate in supporting networks and to create linkages with leading enterprises. The Government should take steps to help improve professional training systems and to enhance the training of highly technical and skilled employees for high technology industry.

In the future, supporting industries should pay more attention to enhancing the production capacity of Vietnam's SMEs in their industries, thus encouraging enterprises to participate in the production networks of FDI enterprises and government corporations. That also is a condition for raising the localization rate of FDI enterprises' products, especially cars, motorcycles, and electrical and electronic products.

By developing and implementing favorable borrowing mechanisms for SMEs in supporting industry, and SMEs in production networks, the government could solve the problem of shortages of working capital to finance new business plans. SMEs having effectively joined production networks, as well as SMEs in important sectors, should be

able to access higher amounts of preferential loan capital. The Government also should focus on policy innovation and institutional reform to encourage commercial banks to provide credit to SMEs, especially those that have joined production networks, and should establish and promote a national credit guarantee program for SMEs.

The Government should establish and maintain a transparent and favorable business environment, improve its business forecasting capacity, and enhance administrative and procedural reform to simplify procedural processes, and continue revising and removing unnecessary procedures at ministerial and provincial levels. By doing this, SMEs' production expenditures can be cut down and as a result, the SMEs could be in a better position to offer competitive prices to customers, thus enhancing their capacity to participate in production networks.

## **5.2. On the Enterprise Side**

SMEs should, first, deal with the constraints they feel in offering competitive prices to customers. This requires SMEs to cut unnecessary costs, and improve the quality of products and by-products provided to final assemblers, intermediate enterprises, foreign importers, and suppliers.

Although information is an obstacle for the development of enterprises, many enterprises seem to have been passive, and to have depended on third party sources of information, particularly on the Government. Thus, one solution to this difficulty might be for SMEs to take the initiative in accessing sources of information. One of the actions that enterprises should take is to establish information systems based on their ICT background, such as building websites, and implementing electronic mail systems.

The quality of human resource is always a concerning issue for enterprises. Training people is a difficult task but retaining them is even more difficult. Better treatment and working environments at large enterprises and other SMEs have drained excellent people from many enterprises. Therefore, enterprises need strategic measures to create links between their workforce and the enterprises, not only on compensations but also on other issues related to career development. As a result, the enterprise can ensure that its labor force is able to meet the requirements of production networks participation.

Although investment in activities to satisfy product quality standards, management quality standards, and social and environmental standards is not effective in the short term, this kind of investment is a passport into production networks. These activities may consume a huge amount of money but they bring long-term value. Thus, SMEs need to invest more in these long-term activities.

At the moment, Vietnamese enterprises, big or small, mostly carry out processing for foreign partners. Research and development activities have not received proper attention. Many enterprises believed that these activities require a tremendous investment in human resource and technology. However, collaboration and sharing responsibility in carrying out research and in developing new products might be a long term solution that brings benefit for enterprises, including SMEs participating in production networks.

## **6. Conclusion**

Vietnam is a country with an important geopolitical and geo-economical position in the South East Asian region. This enables enterprises in general and SMEs in particular to take part in East Asian production networks. However, at present Vietnamese SMEs still do not have a firm and clear position on the linkages in the area. The ratio of enterprises that participate in the production networks is relatively small, and their role is still limited. In the meanwhile, the value added and the effectiveness of participation in the network is rather low.

The main reason for this position is that production networks are a new and complicated subject, not only for Vietnamese enterprises but also for government agencies. In consequence, there are limitations on enterprise and government's perception, and there is inadequate investment in this area. Therefore, enterprises in general and SMEs in particular meet numerous difficulties in their participation in, establishment of and development of their roles in the production networks. Restricted information on markets and customers, limited financial resources, technology and human resource, barriers from the business environment and

the Vietnamese economy are challenges that enterprises must overcome if they want to become members of East Asian production networks and operate effectively in these networks.

In recent times, although production networks are new, enterprises, have been able, directly or indirectly, to take advantage of support from the government and other organizations in participating in and establishing production networks. This support has included training, transferring technology, provision of market information and so on. Although the effectiveness of these supporting measures has been limited, its usefulness can not be denied. Therefore, in future, these measures should be re-evaluated and adjusted to improve their usefulness.

Last but not least, production networks are not only an issue for enterprises in Vietnam, but throughout East Asia. Therefore, the development of production networks needs agreement of, and integrated solutions from all countries in the East Asian area. Hopefully, with their dynamism, East Asian SMEs in general and Vietnamese SMEs in particular will join more, and effectively participate in, the area's production networks.



## Reference

- Amanda Carlier, Tran Thanh Son (2005). "Promote the relation contract amongst Vietnam's enterprises: Policy analysis of private sector development." World Bank, IMF Working Paper, 2005.
- Central Institute for Economic Management. "Small and medium enterprises development in Vietnam: The Case of Electronics and Motorcycle." ERIA working paper, 2007
- Inter-ministerial Circular by Ministry of Planning and Investment, Finance and Public Security No. 05/2008/TTLT-BKH-BTC-BCA dated 29/07/2008 guiding the co-operation mechanism amongst state agencies relating to business registration, tax registration and seal registration of enterprises registered and operating under Law on Enterprises.
- Decision No.115/2004/QD-TTg of 25 June 2004 of the Prime Minister on establishment, organization and operation of credit guarantee funds for SMEs, promulgated with decision No 193/2001/QD-TTg of 20 December 2001 of the Prime Minister
- Decision No. 177/2004/QD-TTg of October 5, 2004 of the Prime Minister approving the master plan on development of Vietnam's automobile industry up to 2010, with a vision toward 2020
- Decision No. 75/2007/QD-TTg of May 28, 2007 of the Prime Minister approving the master plan on development of Vietnam's electronics industry up to 2010, with a vision toward 2020
- Decision No. 02/2007/QD-BCT of August 29, 2007 of the Minister of Trade and Industry approving the master plan on the development of Vietnam's motorcycle industry in the 2006-2015 period, with a vision to 2020
- Decision No. 42/2008/QD-BCT of November 19, 2008 of the Minister of Trade and Industry approving the master plan on the development of Vietnam's textile and garment sector up to 2015, with a vision to 2020
- Decree No. 90/2001/ND-CP of November 23, 2001 on support for development of SMEs
- Decree No. 56/2009/ND-CP of June 30, 2009 on support for development of SMEs
- Enterprises Forum Newspaper, (electronic version ),  
<http://dddn.com.vn/200912160456821cat67/50-doanh-nghiep-chua-su-dung-website.htm>
- General Statistics Office (2009), "Statistical Yearbook of Vietnam 2008", Statistical Publishing House, Hanoi
- General Statistics Office (2009), "The Situation of enterprises through the results of surveys conducted in 2006, 2007, 2008", Statistical Publishing House, Hanoi

John Rand, Patricia Silva, Finn Tarp, Tran Tien Cuong and Nguyen Thanh Tam (2008),  
*Characteristics of the Vietnamese business environment – Evidence from a SME  
survey in 2007*, Hanoi, Financial Publishing House.

Vietnam Textile and Garment association,

<http://www.vietnamtextile.org/ChiTietTinTuc.aspx?MaTinTuc=1342&Matheloai=5>

## Appendix I. Perceptions of Barriers to SME Development

Unit: %

	Not significant	Little	Moderate	Significant	Very significant
<b>1. INTERNAL BARRIERS</b>					
<b>a- Informational barriers</b>					
(1) Limited Information to locate/analyze markets/business partners	29.9	31.1	29.9	7.9	1.2
(2) Unreliable market data (costs, prices, market shares)	26.7	32.1	26.7	12.7	1.8
(3) Inability to identify and contact potential business partners	42.1	23.2	18.9	15.2	0.6
<b>b- Functional barriers</b>					
(4) Lack of managerial time to identify new business opportunities	37.2	28.7	26.8	6.1	1.2
(5) Insufficient quantity of and/or untrained personnel for market expansion	30.9	16.4	26.1	23.6	3.0
(6) Lack of production capacity to expand	29.7	27.3	21.8	15.8	5.5
(7) Shortage of working capital to finance new business plan	22.6	15.9	26.8	23.8	11.0
(8) Difficulty in getting credit from suppliers and financial institutions	26.2	18.9	25.0	21.3	8.5
<b>c- Product and price barriers</b>					
(9) Developing new products	35.4	20.1	28.0	14.6	1.8
(10) Adapting to demanded product design/style	35.4	25.6	23.8	12.8	2.4
(11) Meeting product quality/standards/specifications	33.5	29.9	19.5	12.2	4.9
(12) Meeting packaging/labelling requirements	47.9	29.4	18.4	3.1	1.2
(13) Offering technical/after-sales service	42.0	24.1	25.3	6.8	1.9
(14) Offering competitive prices to customers	18.2	23.6	24.8	20.6	12.7
(15) Difficulty in matching competitors' prices	20.7	23.2	23.2	23.2	9.8

(16) Anti-competitive or informal practices		34.4	27.0	24.5	10.4	3.7
<b>d- Distribution, logistics and promotion barriers</b>						
(17) Complexity of production value chain		39.6	23.8	21.3	13.4	1.8
(18) Accessing a new production chain		36.8	27.0	22.7	11.7	1.8
(19) Establishing and maintaining trust with business partners		36.6	27.4	19.5	12.2	4.3
(20) Unavailability of inventories/ warehousing facilities		59.5	20.9	14.1	3.1	2.5
(21) Excessive transportation/insurance costs		47.8	23.0	15.5	9.9	3.7
(22) Participation in promotional activities to target markets/business partners		27.4	31.1	24.4	15.2	1.8
<b>2. EXTERNAL BARRIERS</b>						
<b>a- Procedural barriers</b>						
(23) Unfamiliarity with complexity of procedures/paperwork		23.3	28.8	30.7	12.3	4.9
(24) Difficulties in enforcing contracts and resolving disputes		39.9	25.8	20.2	11.7	2.5
(25) Lack of home government assistance/incentives		26.2	28.0	24.4	<b>15.9</b>	5.5
(26) Unfavourable home rules and regulations		31.9	28.2	24.5	12.3	3.1
(27) Unfavourable host/foreign rules and regulations		49.1	25.2	16.6	6.1	3.1
<b>b- Business environment barriers</b>						
(28) Poor/deteriorating economic conditions	Home market	24.2	24.2	30.6	16.1	4.8
	Foreign market	40.8	23.2	15.2	10.4	10.4
(29) Inadequacy of basic and IT infrastructure	Home market	42.7	24.2	23.4	6.5	3.2
	Foreign market	58.4	18.4	12.8	7.2	3.2
(30) Political instability	Home market	80.8	9.6	7.2	0.8	1.6
(31) High tax and tariff barriers	Home market	41.7	22.8	19.7	11.0	4.7
	Foreign market	59.4	16.4	11.7	9.4	3.1

(32) Inadequate property rights protection	Home market	65.4	18.1	11.0	4.7	0.8
	Foreign market	73.0	12.7	9.5	4.8	0.0
(33) Restrictive health, safety and technical standards	Home market	55.1	26.8	13.4	3.9	0.8
	Foreign market	61.1	16.7	11.1	7.9	3.2
(34) High costs of Customs administration, in exporting or importing	Home market	45.3	20.3	21.9	9.4	3.1
	Foreign market	53.5	18.1	18.1	6.3	3.9
<b>d- Other barriers</b>						
(35) Perceived risks in your current and new business operations		33.5	31.1	22.4	8.1	5.0
(36) Lack of the perceived benefits from joining production networks		41.0	28.6	23.0	6.8	0.6
(37) Willingness to adopt new business strategy or ideas		32.7	26.5	26.5	9.9	4.3
(38) Other barriers (please specify)						

## CHAPTER 8

# **Integrating SMEs into East Asia Production Networks: Thailand**

**CHAIYUTH PUNYASAVATSUT**

Faculty of Economics, Thammasat University

*This paper examines barriers facing Thai SMEs, and identifies success factors for better participation in production networks. It utilizes information from a recent enterprise survey in 2009 covering clothing, automotive and electronics industries. Overall, SMEs perceived external barriers - business environment and tax, tariff and nontariff- as the most significant barriers. Key barriers for SMEs in the networks are difficulties in meeting product quality and standards, and in matching competitors' prices, and lack of personnel for market expansion. Salient characteristics among SMEs participating actively in networks are their strong technological capabilities and proximity to ports or location within industrial estates. Strengthening absorptive capacities of SMEs, with special attention paid to technological development and its dissemination to SMEs, should be given higher priority.*

## **1. Introduction**

Rapid advancements of global production networks (GPNs) have attracted considerable attention from both academics and practitioners in recent decades. Theoretical literature on this subject postulates many advantages of participating in networks, ranging from better access to external business resources and knowledge diffusion, to achieving economies of scale. Empirical studies began to provide more understanding of the drivers and mechanics of GPNs through country-case studies. The majority of these studies focused on the development of GPNs with emphasis on the role of MNEs in nurturing their networks. However, studies relating to the participation of SMEs in production networks are rather limited.

Understanding how to integrate SMEs into GPNs is clearly important and complex. Assisting SMEs through networking and subcontracting with large enterprises/MNEs could provide a short cut to enhancing SME competitiveness, as proposed by previous studies (Wattanaputtipaisan 2002; UNCTAD 2001; Berry 1997). Wattanaputtipaisan (2002) presented various parameters of SME capabilities and competitiveness to indicate their potential readiness as suppliers to large enterprises. Ernst and Kim (2002) argued that continual upgrading of SMEs' business capabilities is important for them to stay in GPNs. Most SMEs, which form lower-tier suppliers, can be easily replaced by foreign-affiliated firms or downgraded to a lower tier, as in the case of the Thai automotive and parts industry. However, forming and deepening linkages with large firms are also subject to their practices and preferences, suggesting opportunities for some governmental roles. Thus, knowledge of successful characteristics and shared weaknesses of SMEs participating in the production networks provides insight for formulating industrial and development policies.

This paper aims to gain better understanding of the characteristics of, and barriers facing SMEs participating in the production networks. To achieve this goal, the paper examines barriers facing Thai SMEs and identifies success factors for better participation in the production networks. The study utilizes information from a recent enterprise survey conducted in 2009. It also provides assessments of current government support in terms of its effectiveness as perceived by SMEs.

This paper is organized as follows: Section 2 provides background information on Thai SMEs and the recent status of production networks in three industries: clothing, automotive and parts, and electronics. Section 3 analyzes perceived barriers to SMEs joining production networks. Section 4 explores characteristics of successful SMEs in production networks. Section 5 gives some brief SME policies regarding networking, and some assessment of current government support programs geared towards SMEs. The final section concludes and gives policy recommendations.

## **2. SMEs and Production Networks in Thailand**

### **2.1. Definition and Significance of Manufacturing SMEs**

Thailand is a lower middle-income country and a reasonably open economy. In the 1980s and much of the 1990s, Thailand was one of the fastest growing economies in the world. During the boom period from 1987 to 1996, real GDP grew by 9.5%. During the 1997-1998 financial crisis, real GDP growth fell to below zero. Since then, Thailand began to recover and grew by an average of 4.7% until 2007. However, real GDP growth in 2008 slowed to 2.6%, due the global financial crisis and domestic political uncertainty.

Thai Manufacturing SMEs are defined as firms with less than 200 employees and 200 million Baht of fixed assets, equivalent to 5.6 million USD. In 2008, the number of registered establishments in the manufacturing sector was 544,762, a decrease from 691,926 in 2004. Manufacturing SME accounted for 19.3% of the total. In 2008, manufacturing SMEs generated 33.7% of manufacturing value added. They employed around 3.46 million workers, accounting for 38.9% of total SME employment or 64.3% of manufacturing employment in 2007. SME value added in manufacturing GDP rose 8% on average during the period 2002-2006.

In terms of sectoral composition, sectors with the top-three highest share of SME value-added are Food Products and Beverages (ISIC15), Furniture (ISIC 36) and Chemicals and chemical products (ISIC24). SME value-added shares in total



Manufacturing in wearing apparel (ISIC18) and motor vehicles and parts (ISIC34) accounted for only 7.9% and 0.8% in 2008, respectively.

In terms of exports, the value of exports by SMEs in 2008 was 50,693.8 million USD, an increase of 11.2% from the 2007 figure. Share of SME exports to total exports was 28.9%, and accounted for 49.1% of GDP generated by SMEs. Share of SME imports to total imports was 26.3% in 2008.

## **2.2. The Roles of Production Networks**

The roles of production networks in Thailand can be seen especially in three industries: clothing, automotive and parts, and electronics. The clothing industry provides an interesting case for MNE-SME linkage via buyer-chains, global production networks, or a global value chain as defined by Gereffi and Memedovic (2003). This type of network involves the role of lead firms in setting up production networks in many exporting developing countries to optimize the effectiveness of the total value chain. The buyer-chain networks involve simple products where innovation is strong in terms of both product design and global marketing.

The Thai automotive and electronics industries were chosen for cases of producer-driven chains, which are dominated by MNE or large manufacturing enterprises. These producer-chain networks deal with complex structures of cross-border linked networks (Ernst and Kim 2002). Technology and manufacturing know-how in these networks are their companies' core competencies, and need to be developed in-house. The Thai automotive industry was chosen because it is now considered to be part of the regional and global production networks of Japanese firms, which have strong production network in ASEAN. The Thai electronics industry, one of the important export sectors, has become one of the largest production bases for hard disk drive manufacturing, enjoying 42% of world production in 2005. It has also been promoted as an Asian electronics hub by recent Thai government policy.

This section provides a summary of evidence of inter-firm networking and subcontracting between SMEs and MNEs among these production networks.

### *2.2.1. Clothing Industry*

Many previous studies argued that integration of SMEs into the global production networks of MNEs provides a short cut to export success in the clothing industry (Gereffi 1999; UNCTAD 2000; Memedovic 2004). The main benefits of these networks are that they lower the cost of entering foreign markets, and gain some export spillover. MNEs have better information on consumer tastes, distribution and marketing channels, and trade regulations. Local firms, as subcontractors, could then potentially acquire knowledge about production technology and market information from the MNEs. Thus, involvement between local firms and MNE buyers can create significant contribution to international market penetration and product upgrading.

In the case of Thailand, knowledge about existing linkages between SMEs and MNE networks in the clothing industry is still limited. Based on firm interviews, Kohpaiboon (2008) indicated that linking with MNEs could contribute to technological improvement of local suppliers since there is continual pressure on local suppliers to keep improving their productivity. However, involvement with MNEs is still limited in this industry as many SMEs want to keep their business flexibility. Evidence showed a stronger degree of MNE involvement in Thai clothing exports. Regardless of firm size, involvement with MNEs seems necessary for SMEs to become internationalized and successful in exporting. As a subcontractor, the large and medium local suppliers, who can provide full-package services to international traders and marketers, reported considerable benefits from their networking with MNEs. This type of network generates substantial backward linkage in the local market because subcontractors are expected to develop reliable local supply sources.

However, the same opportunities for technological and managerial learning from MNEs are not evident for small suppliers or second and third-tier suppliers. Evidence from interviews also indicated that SMEs were not well aware of the potential benefits of globalization. They preferred working independently to working as a subcontractor. And surprisingly, horizontal networking among local SME suppliers was found to be weak, despite facing more global competition.

### 2.2.2. *Automotive Industry*

The Thai automotive industry began in 1961. Its production began to increase rapidly in the 1990s after the appreciation of the Yen and the Thai government's liberalization policy. The local content requirement was abolished in 2000. After the recovery from the 1997 Asian financial crisis, the production and production capacity has accelerated again. Many car assemblers use Thailand as part of their global production network. In 2006, almost 0.5 million cars were exported, most of which were one-ton pick-ups. The Thai automotive industry is now becoming export-oriented, and a part of the ASEAN global production base.

As a regional hub, MNE automakers need to modernize local parts suppliers. They place higher demand on their local partners. In this process, Japanese car makers induce their home-based suppliers to relocate to Thailand. As a result, many parts suppliers are foreign affiliated and joint-venture firms. Inefficient indigenous or wholly Thai-owned suppliers were replaced or crowded out. There are now only a dozen Thai firms which are first-tier suppliers for less knowledge-intensive parts. Most of them are second or third-tier suppliers of raw materials.

Yet, evidence from interviews showed that parts suppliers provided technical know-how and service to existing lower-tier firms so as to meet their demands in terms of quality and management (Techakanont 2008). The extents to which technological and managerial transfers occurred, besides the corporate strategy of large enterprises, were also related to lower-tier suppliers' absorptive capacities and their commitment to product upgrading. For example, there is evidence that Japanese car assemblers have intensified linkages with local suppliers. They invested in some important activities to improve the standard of their production networks in Thailand. Some local production networks were found to help in facilitating knowledge sharing among suppliers through supplier associations, knowledge transfer consultants and small group-learning teams (Poapongsakorn and Techakanont 2008).

Participating in the automotive global production network provides Thailand both macro and firm-level benefits. Poapongsakorn and Techakanont (2008) indicated that major firm benefits were productivity improvement, economies of scale, and reducing

defect rate, while the macro benefits were increased production volume and exports, trade surplus and lower car prices.

Firms in the Thai automotive industry have been found to be geographically concentrated more in the industrial estates in Bangkok and the eastern regions alongside rising production networks. Poapongsakorn and Techakanont (2008) argued that automotive firms located in industrial estates seem to enjoy greater benefits from good public utility services, convenient transportation, and close proximity to their customers, rather than agglomeration economies. Surprisingly, their study found no agglomeration economies from the labor and input markets among firms in the same industrial estates. In addition, the distance between firms and their input suppliers had little impact on their capability.

Focusing on SMEs' participation in networking, Punyasavatsut (2008) found that, compared to the past, linkages and spillovers between first-tier and lower tier suppliers in the automobile and parts industry had significantly improved. Based on firm interviews, he also found that networking among lower-tier local suppliers becomes intensified if they are members of a current global production network.

### 2.2.3. *Electronics Industry*

Thailand's electronics industry ranks very highly in terms of export values. In 2005, Thailand became one of the largest production bases for hard disk drive (HDD) manufacturing, enjoying 42% of world production. In 2006, the Thai government began to promote the country as an Asian electronics hub, competing with Singapore, Malaysia and China.

The Thai electronics industry has been dominated by foreign MNE subsidiaries which do not conduct extensive and sophisticated technological activities such as R&D and design in Thailand. Early development of this industry showed relatively low linkages with local manufacturers and other institutions such as universities or research institutions (AIT 2004). In the HDD industry, the local supplier base and supporting industries were still very shallow. Most firms were linked, to some extent, into a vertical supply chain, sharing information about new products and related issues. But innovation-related vertical links were weak. Moreover, even fewer firms established

horizontal linkages to universities and specialized institutions, indicating weak innovation-related horizontal links.

In 2003, the National Science and Technology Development Agency (NSTDA) initiated a plan to strengthen the hard-disk drive cluster in Thailand. The plan aims to upgrade the technological capability of workforces, to keep up with rapid and constant changes in technology found in this sector. Hobday and Rush (2007) indicated that upgrading the technological capabilities of local Thai electronics subsidiaries differed in rates and patterns, depending on the technology strategy of the global value chain's leader or parent company.

A recent study by Kohpaiboon (2009) indicated that Thailand will need to keep improving the quality of its science and technology workforce and standards, in order to enhance technological capabilities in the HDD industry. Based on firm interviews, his findings showed that important entry barriers facing SMEs were a cascading tariff structures, and the business culture of the SMEs.

In summary, literature on inter-firm networking and subcontracting between large and small firms in the production networks indicated that (a) in Thailand; there were evidence supporting positive linkages and spillovers among local small firms through networking with MNEs and first-tier suppliers. The network helps local firms to gain better access to technology and marketing information, and to move up the quality ladder; (b) In contrast to vertical linkages and networking, horizontal networking among lower-tier SMEs was found to be weak; (c) Barriers facing lower-tier supplier to joining the networks are the technological capability gap (higher cost of learning) and loss of flexibility in running their business; (d) Major reported barriers to transferring technology to SMEs are lack of effective and motivated SMEs, and gaps in technology between first and lower tiers.

### **3. Barriers to SME Growth**

Understanding barriers to SME growth generally will help when designing appropriate policies and supporting programs. Policy makers often considered internal

barriers facing SMEs to be the most important, rather than external barriers. OECD (2008) indicated that barriers are not constant and not uniform for all SMEs. External barriers, like the business environment, are underestimated by firms that are not yet active exporters, while internal barriers, such as financial issues and access, are overstated. This could lead to reduced effectiveness of government supporting programs if true barriers facing SMEs are not identified.

### **3.1. Survey and Data Description**

The survey was designed to obtain SMEs' perceptions of the most important barriers to exporting/joining production networks. The survey lists 38 known barriers and asks SMEs to assess the importance of each barrier using a five-point Likert scale, ranging from "extremely significant" (1) to "not significant" (5). The 38 known barriers are classified into 8 groups: informational barriers; functional barriers; product and price behaviors; distribution, logistics and promotion barriers, procedural barriers; business environment barriers; tax, tariff and non-tariff barriers; and other barriers. SMEs were then asked to rank these 8 groups of barriers in terms of importance. Details of the questionnaire are presented in the appendix.

The firm survey was conducted from September to November 2009. A list of 1,084 firms was sampled from 3 industries: clothing, automotive and parts, and electronics. These samples were drawn from the database of the Office of Industrial Economics, Ministry of Industry, focusing only on SMEs. Questionnaires were mailed to company owners or managing directors and were then followed up by face-to-face or phone interview. To ensure the accuracy of data from the survey, additional data on sales and cost structure were obtained from the Department of Business Development, Ministry of Commerce.

In total, data from 77 firms were obtained, after excluding incomplete answers and inappropriate firm characteristics. The effective response rate was about 7.1%. The proportions of responding firms categorized by size and types of business are shown in Table 1(a). About 40% of responding firms were from the clothing industry, 33% from the automotive and parts industry, and 21% from the electronics industry. Of all firms, 83% were classified as small or medium enterprises.

Table 1(b) shows the distribution of responding firms which were actively participating in a production network. Of all 77 samples, 36 firms or 47% were classified as firms participating in a global production network. The percentage of responding firms involved in the network was higher in the automotive and electronics industry, and somewhat lower in clothing industry. More than two-thirds of sample firms in the automotive and parts, and electronics industries were participating in a production network. Only 10% of clothing firms participated in a production network.

**Table 1(a). Distribution of Responding Firms by Firm Size and Types of Business**

Types	Numbers of Employees					Total
	1-5	6-49	50-99	100-199	>200	
Clothing	1	9	5	12	3	30
(percent)	-3.3	-30	-16.7	-40	-10	-100
Automotives	1	4	4	9	8	26
(percent)	-3.8	-15.4	-15.4	-34.6	-30.8	-100
Electronics	0	5	8	6	2	21
(percent)	0	-23.8	-38.1	-28.6	-9.5	-100

Source: ERIA SME Survey 2009.

**Table 1(b). Distribution of Responding Firms by Production Network and Types of Business**

Type \ Employees	In Production Network					Total
	1-5	6-49	50-99	100-199	>200	
Clothing	0	0	2	1	0	3
Automotives	0	2	4	7	6	19
Electronics	0	5	4	3	2	14
Total	0	7	10	11	8	36

Source: ERIA SME Survey 2009.

### 3.1.1. Firms' Characteristics

Table 2 shows the main characteristics of the sample firms in terms of firm age in 2009, ownership structure, sales revenues, net profit, sources of finance, sources of inputs, plant locations, and sales patterns. The responding firms have been in operation

for about 20, 15, and 22 years in clothing, automotive, and electronics, respectively. The industry with the highest share of foreign ownership is automotive, followed by electronics and clothing. About 53% of the responding firms are engaged in exporting their products.

**Table 2.**

<b>Firm Characteristics</b>	<b>Clothing</b>	<b>Automotives</b>	<b>Electronics</b>
Numbers of firms	30	26	21
Age	20.1	15.4	21.7
<b>Ownership</b>			
Domestic (%)	91.46	58.82	86.83
Foreign (%)	8.54	41.12	13.16
<b>Sales</b>			
growth in 2007	3.4	133.4	5.54
growth in 2008	-10.21	36.34	59.29
<b>Profit</b>			
2007	-1.05	3.56	1.4
2008	-1.58	5.07	2.42
<b>Cost Structure 2008</b>			
Labor cost	37.22	16.87	15.58
Raw materials	40.11	47.85	58.02
Utility	2.73	8.5	4.25
Interest	1.96	2.07	0.76
Others	17.98	22.95	21.25
<b>Employee Education</b>			
% tertiary	5.55	18.01	22.23
% Vocational	11.73	18.65	15.31
% high school or less	82.89	63.97	61.17
<b>Source of Working Capital</b>			
Retained Earning	8.36	35.5	32.8
Bank	7.63	16.61	17.36
Other financial institutions	0	0.04	0
Others	71.58	45.93	50.17
<b>Average Borrowing cost</b>	<b>7.12</b>	<b>5.55</b>	<b>6.13</b>
<b>Source of Inputs</b>			
Domestic (%)	88.9	67.1	87.9
Imports (%)	11.1	29.9	12.1
<b>Output destinations</b>			
Domestic (%)	76.6	78.1	74.4
Exports (%)	23.4	21.9	28.6
<b>Firm Location</b>			
Distance from ports	48.3	63.3	31.5
Distance from industrial zone	35.6	36.4	55.6

Source: ERIA SME Survey 2009.



### 3.1.2. Business Capability

Table 3(a) summarizes business capabilities of the sample firms. Business capabilities indicated firms' efforts to improve their business's processes or organization, or to adopting new production methods in the past 3 years. The survey showed that more than 80% of the responding firms in the automotive industry have met an international standard. Only about one-third of clothing firms and a half of electronics firms have met an international standard. More than 60% of responding firms have introduced ICT in order to improve their business processes. As for business associations or business networks, more than 50% of automotive and parts SMEs were active. Also, in 2009 more than two-thirds of SMEs in automotive and parts reported spending to improve their business capabilities in various ways, such as purchasing new machines, new know-how or introducing their own products.

Table 3(b) summarizes business capabilities of SMEs that were in or out of a production network. The results of the survey showed that ability to build these capabilities was not significantly higher among firms in the production networks. Firms in the production networks engaged more in activities to improve their capabilities through meeting international standards, developing new plants, attending business associations, buying new machines, and using new know-how. However, the differences were not significant.

**Table 3(a). Summaries of Business Capability of SMEs by Types of Business**

<b>Business Capability</b>	<b>Clothing</b>	<b>Automotives</b>	<b>Electronics</b>
Met ISO	36.67	88.46	52.38
Introduced ICT	70	61.5	61.9
Established new division or plants	23.33	42.31	33.33
Attend business assoc. or networks	40	53.8	38.1
Bought new machines or facilities	40	88.46	47.62
Improved existing machines	80	96.15	76.2
Introduced new know-how	43.33	76.92	57.14
Introduced new products in last 3 years	70	84.6	76.2
Average Expense on training (USD)	671	10,316	2,434

*Source:* ERIA SMEs Survey, 2009.

**Table 3(b). Summaries of Business Capability of SMEs In and Out Production Networks**

<b>Business Capabilities</b>	<b>In</b>	<b>Out</b>	<b>Total</b>
Met ISO	25	20	45
(%)	55.56	44.44	100
Introduced ICT	24	26	50
(%)	48	52	100
Established new division or plants	14	11	25
(%)	56	44	100
Attend business assoc. or networks	19	15	34
(%)	55.88	44.12	100
Bought new machines or facilities	24	21	45
(%)	53.33	46.67	100
Improved existing machines	29	36	65
(%)	44.62	55.38	100
Introduced new know-how	23	22	45
(%)	51.11	48.89	100
Introduced new products in last 3 years	29	30	59
(%)	49.15	50.85	100

*Source:* ERIA SMEs Survey, 2009.

### **3.2. SMEs' Perceptions of Barriers**

Responding SMEs were asked to assess each of the 38 barriers by using the 5-point Likert scale. The barriers were then ranked in order of average score. Details of mean score and its standard deviations are also shown in Appendix 1. The standard deviation can be used to measure consensus among the respondents on a specific barrier.

Table 4 shows the top ten perceived barriers across 3 industries in this study. In the clothing industry, firms tend to view internal barriers as the most important. The internal barriers which are perceived to be the most significant are: difficulties in matching competitors' prices, developing new products, limited information for locating partners or analyzing the market, difficulty in offering competitive prices to customers, and facing high taxes and tariffs in the home market.

In the automotive and parts industry, firms view both internal and external barriers as important. The barriers they perceive as the most significant are: restrictive health, safety and technical standards in the home market, difficulty in participating in

promotional activities to target new customers or business partners, inadequate property rights protection in the home market, complexity of production value chain, and difficulties in enforcing contracts and resolving disputes.

In the electronics industry, firms tend to see external barriers as the most important. Their highest-ranked external barriers are restrictive health, safety and technical standards in foreign markets, high costs of customs administration in exporting or importing, inadequate property/rights protection in foreign markets, high tax and tariff barriers in foreign markets, and restrictive health, safety and technical standards in the home market.

**Table 4. Ranked Top-Ten Barriers Faced by SMEs Classified by Type of Business from 1 (Very Significant) to 5 (Insignificant)**

Rank	Type of Business		
	Clothing	Automotives	Electronics
1	B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) (foreign market)	B30. Political instability (home market)	B34. High costs of Customs administration, in exporting or importing (foreign market)
2	B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) (home market)	B28. Poor/deteriorating economic conditions (foreign market)	B28. Poor/deteriorating economic conditions (home market)
3	B30. Political instability (foreign market)	B5. Insufficient quantity of and/or untrained personnel for market expansion	B28. Poor/deteriorating economic conditions (foreign market)
4	B32. Inadequate property rights protection (e.g. intellectual property) (foreign market)	B28. Poor/deteriorating economic conditions (home market)	B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) (foreign market)
5	B13. Offering technical/after-sales service	B30. Political instability (foreign market)	B30. Political instability (home market)
6	B22. Participation in promotional activities to target markets/business partners	B15. Difficulty in matching competitors' prices	B31. High tax and tariff barriers (foreign market)
7	B31. High tax and tariff barriers (foreign market)	B11. Meeting product quality/standards/specifications	B30. Political instability (foreign market)
8	B28. Poor/deteriorating economic conditions (foreign market)	B19. Establishing and maintaining trust with business partners	B32. Inadequate property rights protection (e.g. intellectual property) (foreign market)
9	B19. Establishing and maintaining trust with business partners	B35. Perceived risks in your current and new business operations	B34. High costs of Customs administration, in exporting or importing (home market)
10	B32. Inadequate property rights protection (e.g. intellectual property) (home market)	B2. Unreliable market data (costs, prices, market shares)	B19. Establishing and maintaining trust with business partners

Source: ERIA SMEs Survey, 2009.

Table 5 shows the top 10 barriers for all samples, and for those which are both in and out of production networks. Based on means of a 5-point Likert scale assessment of 38 barriers, nine out of the top ten barriers among all responding SMEs are found to be external barriers. In particular, these top barriers are from two categories: (a) business environment barriers; and (b) tax and tariff and non-tariff barriers. The relative importance of these external barriers remains when firms are classified as those participating in or out of production networks. Overall, the responding firms perceived external barriers to be the most important in 2009. It should be noted that the top perceived SME barriers reflect higher shares of samples from the automotive and electronics, electrical, parts and machinery industries together. It is known that these industries are pro-cyclical. Sales were greatly affected by short-run shocks in income, a result of the 2008 global financial crisis. Their sales patterns were also vulnerable to changes in domestic macroeconomic conditions. Political uncertainty since the 2006 coup has exacerbated deteriorating economic conditions in Thailand, thereby adversely affecting their business. Business environment barriers thus mirrored current top barriers facing SMEs in these industries.

**Table 5. Ranked Top-Ten Barriers Faced by SMEs from 1 (Very Significant) to 5 (Insignificant)**

Rank	All sample	Production Network	
		In	Out
1	B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) (foreign market)	B28. Poor/deteriorating economic conditions (foreign market)	B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) (foreign market)
2	B30. Political instability (foreign market)	B30. Political instability (home market)	B30. Political instability (home market)
3	B28. Poor/deteriorating economic conditions (foreign market)	B30. Political instability (foreign market)	B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) (home market)
4	B32. Inadequate property rights protection (e.g. intellectual property) (foreign market)	B28. Poor/deteriorating economic conditions (home market)	B32. Inadequate property rights protection (e.g. intellectual property) (foreign market)
5	B34. High costs of Customs administration, in exporting or importing (foreign market)	B34. High costs of Customs administration, in exporting or importing (foreign market)	B13. Offering technical/after-sales service
6	B30. Political instability (home market)	B33. Restrictive health, safety and technical standards (e.g. sanitary and phytosanitary requirements) (foreign market)	B19. Establishing and maintaining trust with business partners
7	B28. Poor/deteriorating economic conditions (home market)	B31. High tax and tariff barriers (foreign market)	B28. Poor/deteriorating economic conditions (foreign market)
8	B31. High tax and tariff barriers (foreign market)	B32. Inadequate property rights protection (e.g. intellectual property) (foreign market)	B31. High tax and tariff barriers (foreign market)
9	B19. Establishing and maintaining trust with business partners	B11. Meeting product quality/standards/specifications	B22. Participation in promotional activities to target markets/business partners
10	B35. Perceived risks in your current and new business operations	B15. Difficulty in matching competitors' prices	B34. High costs of Customs administration, in exporting or importing (foreign market)

Source: ERIA SMEs Survey, 2009.

In addition, the responding firms were asked to rank all 8 barrier groups from 1 (extremely important) to 8 (least important) simultaneously. Table 6 shows the ranked groups of barriers faced by SMEs, classified by type of business and whether the firm is in or out of a production network. When classified by type of business, the top 4 groups of barriers are: (1) functional barriers, (2) product and price barriers, (3) distribution, logistics and promotion barriers, and (4) procedural barriers. Product and price barriers were ranked as the most important for the clothing and electronics industries, while the functional barriers were the most important for the automotive and parts industry.

**Table 6(a). Ranked Group of Barriers Faced by SMEs from 1 (Highest) to 8 (Lowest) by Types of Business**

Rank	Type of Business		
	Clothing	Automotives	Electronics
1	Product and price barriers	Functional barriers	Product and price barriers
2	Functional barriers	Product and price barriers	Distribution, logistics and promotion barriers
3	Distribution, logistics and promotion barriers	Distribution, logistics and promotion barriers	Functional barriers
4	Procedural barriers	Procedural barriers	Procedural barriers
5	Tax, tariff and non-tariff barriers	Informational barriers	Tax, tariff and non-tariff barriers
6	Informational barriers	Tax, tariff and non-tariff barriers	Informational barriers
7	Business environment barriers	Business environment barriers	Business environment barriers
8	Other barriers	Other barriers	Other barriers

*Source:* ERIA SMEs Survey, 2009.

**Table 6(b). Ranked Group of Barriers Faced by SMEs from 1 (Highest) to 8 (Lowest) In / Out Production Networks**

Rank	All Samples	Production Network	
		In	Out
1	Product and price barriers	Product and price barriers	Functional barriers
2	Functional barriers	Functional barriers	Product and price barriers
3	Distribution, logistics and promotion barriers	Distribution, logistics and promotion barriers	Distribution, logistics and promotion barriers
4	Procedural barriers	Procedural barriers	Tax, tariff and non-tariff barriers
5	Tax, tariff and non-tariff barriers	Informational barriers	Procedural barriers
6	Informational barriers	Tax, tariff and non-tariff barriers	Informational barriers
7	Business environment barriers	Business environment barriers	Business environment barriers
8	Other barriers	Other barriers	Other barriers

*Source:* ERIA SMEs Survey, 2009.

As for firms in production networks, the top-3 barriers are: (a) product and price barriers, (b) functional barriers, and (c) distribution, logistics and promotion barriers. These results from firms operating with production networks were not different from results from all samples combined. The results indicate the importance of product quality, standards and specifications. SMEs perceived some difficulties in meeting these requirements. The next important barrier among 'price barriers' was difficulty in matching competitors' prices. The lack of price competitiveness reflected rising domestic costs of production. Among the 'functional barriers', key barriers were: insufficient numbers of personnel for market expansion and lack of specialized expertise to deal with new business opportunities. Among the distribution and logistics barriers, SMEs stressed the importance of establishing and maintaining trust with business partners, and accessing new production chains.

Firms outside production networks feel more strongly about functional barriers, followed by product and price barriers, then distribution, logistics and promotion barriers. These results reflect current weaknesses of SMEs, in terms of insufficient manpower, and working capital for new business opportunities. Among product and price barriers, SMEs outside networks did not have to meet stringent product quality



requirements or other standards. Instead, they were more concerned about offering technical or after-sales services and meeting packaging and labeling requirements. SMEs outside networks were also concerned with logistical arrangements and problems associated with promotion to targeted consumers.

#### **4. Characteristics of SMEs in Production Networks**

From the results of the survey, this section identifies characteristics of firms in and outside networks. It examines whether there are salient characteristics of firms participating in production networks. Characteristics which are more likely to be found among firms in networks are postulated as follows: (1) larger firm size, (2) more years in business, (3) larger proportion of foreign ownership, (4) higher productivity, (5) fewer financial constraints, (6) firms located close to ports or within industrial estates, (7) firms with higher technological capabilities.

Due to the small number of samples participating in production networks, it is difficult to conduct rigorous statistical tests. However, some patterns can be identified by comparing frequencies of firms' characteristics as shown in Table 7. We found that, when compared to SMEs which are not in networks,

- Size: SMEs in automotive and electronics production networks were smaller in size, determined by numbers of employees.
- Age: Firms in automotive production networks were younger.
- Ownership: SMEs in electronics networks had a larger proportion of foreign ownership.
- Productivity: Firm productivity was measured by labor productivity, sales growth and profits. We found that SMEs in automotive networks had higher labor productivity. Sales growth was higher for firms in all 3 networks. Profits among firms in automotive and clothing networks were higher.
- Financial constraints: It is not clear if SMEs in the production networks had better financial positions, compared to those outside the networks. Sample firms outside

the networks were found to be strong and not vulnerable to poor economic conditions.

- Location: The results showed that firms in all production networks were located closer to ports, or tended to be located within an industrial estate.
- Technological capability: We measure technological capability in terms of skill intensity, which is defined as the ratio of employees with tertiary and vocational education to total employment. The findings showed that, in all 3 industries, SMEs in production networks were more skills-intensive.



**Table 7. Frequency of Firm Characteristics by Status In and Out Production Network**

Firm Characteristics	Frequency (%) by status	
	Out	In
Ownership		
Foreign share less than 0.2	0	7.69
Foreign share between 0.2 and 0.5	40	38.46
Foreign share between 0.5 and 0.8	0	7.69
Foreign share more than 0.8	60	46.15
Labor Productivity (1000 USD/worker)		
Less than 12.34	29.27	19.44
Between 12.34 and 20.98	26.83	22.22
Between 20.98 and 60.17	19.51	30.56
More than 60.17	24.39	27.78
Growth		
Less than -0.087	34.15	13.89
Between -0.087 and 0.078	21.95	30.56
Between 0.078 and 0.18	24.39	25
More than 0.18	19.51	30.56
Working Capital Source		
Retained Earnings	15.15	28.13
Bank	3.03	18.75
Other financial institutions	0	0
Others	81.82	53.13
Capital Expansion Source		
Retained Earnings	18.18	25.93
Bank	3.03	18.52
Other financial institutions	0	0
Others	78.79	55.56
Interest coverage ratio		
Less than 35.73	30.43	22.22
Between 35.73 and 72.56	26.09	22.22
Between 72.56 and 200.74	21.74	29.63
More than 200.74	21.74	25.93
Location: distance from port		
Less than 20 Km.	24.39	27.78
Between 20 and 36.4	29.27	16.67
Between 36.4 and 67.5	21.95	30.56
More than 67.5 Km.	24.39	25
Technological Capabilities: Skill intensity ratio		
Less than 0.097	36.59	13.89
Between 0.097 and 0.2	31.71	13.89
Between 0.2 and 0.39	17.07	36.11
More than 0.39	14.63	36.11

Source: Author's calculation.

Of all these characteristics, the most salient one for SMEs in production networks is their strong technological capabilities. The next prominent characteristic is firm efficiency, reflected by higher productivity. Also, higher profit and more sales by firms in the networks could also imply strong capabilities in areas other than production. Overall, stronger capabilities of SMEs are clearly among many key determinants for successful participation in networks. It can be argued that SMEs in networks receive a wide range of support from larger firms, making them more productive and technologically capable. However, knowledge transfer is not automatic, and depends largely on the absorptive capacity of the SMEs. It is likely that firms participating in the production networks must meet various requirements, and must be performing well, prior to joining the networks.

The next distinct characteristic for firms participating in production networks is their location. As with larger firms, SMEs in the production networks have a higher tendency to locate in industrial estates and close to ports. The major benefits of being located in industrial estates are low cost of transportation, lower cost of communication, and economies of scale in production (Poapongsakorn and Techakanont 2008).

So far, it is difficult to make a strong statement about the size, age and ownership characteristics of firms participating in production networks. Efficient firms could be smaller in size and/or younger.

In all, our findings indicate one strong conclusion. Firms participating in production networks, regardless of size or age, must keep up with latest technologies in production, management and organization. This implies that SMEs must be flexible and able to respond quickly to changes in market demand, or changes in the quality requirements of large firms. Participation in production networks requires SMEs to have competitive advantages in the areas of cost reduction, and speed and flexibility of delivery, as argued by Ernst and Kim (2002). This conclusion is consistent with the top-ranking perceived barriers facing SMEs in production networks, as discussed in the previous section. That is, Thai SMEs face some difficulty in meeting these stringent requirements by large firms, and have difficulty in matching competitors' prices.

## **5. SME Policies and Assessment of Current Government Support Programs**

### **5.1. SME Policies<sup>1</sup>**

Before 2000, Thailand did not have a basic law on SMEs which could give coordinated and explicit guidelines for the promotion and long-term development of SMEs. Instead, SME-related policies and measures were articulated and embodied in the National Economic and Social Development Plan and cabinet solutions. Various ministries then translated these policies into action plans. Due to a lack of coordinating agencies which could supervise the direction of SME development plans, and discontinued emphases of SME significance for economic growth in the national plan, government programs towards SME development were fragmented and weak during this period.

When the financial crisis occurred in 1997, reviving SMEs was seen as a good solution to stimulate the economy. Due to their growing importance as an economic and political force, policy formulation specifically for SMEs was called for. In 2000, the first SME Promotion Act was introduced. The Office of SMEs Promotion was set up in the same year as a coordination body among government agencies, working to develop SMEs. The main responsibilities of the new office are (a) Formulating an SME promotion master plan and SME promotional policies, (b) Preparing action plans for the promotion of regional/sector SMEs as well as micro and community enterprises, (c) Serving as the country's SME information center and the central organization in conducting research and studies on SME-related issues including an SME early warning system, (d) Developing information systems and networks to support the operation of SMEs, and (e) Administering the Venture Capital Fund (VC) for SMEs.

The First 2002-2006 SME Promotion Plan aimed to create more entrepreneurs and to enable SMEs to reach international standards. In particular, the plan aimed to enhance the efficiency of operations in SMEs' business as well as in other sectors, to

---

<sup>1</sup> This section borrows heavily from Punyasavatsut (2009).

create a business environment which would facilitate SMEs, improving market efficiency and competitiveness, and promoting grass-roots businesses so that they could play a more prominent role in income distribution and bring prosperity to the provinces.

In all, the government's first SME promotion policy has 3 main planks: investment promotion, financial assistance, and technical and management consultancy. Investment promotion for SMEs and large enterprises is operated under the supervision of the Board of Investment (BOI) agency. The BOI was established in 1977, under the Investment Promotion Act, as a tool to help promote foreign and domestic investment. In 2006, there were 582 SME investment projects approved by the BOI. Among these, 443 projects or 76.1% of the total, were approved for small enterprises. The value of SME investment projects promoted by the BOI was Bt 30,139 million in 2006. About 62.5% was for investment projects by small enterprises.

In compliance with the SME Promotion Act, the Small and Medium Enterprise Development Bank of Thailand, or SME Bank, was founded in 2002. The new SME bank is an upgrade of the Small Industry Finance Corporation, a small 50:50 financial joint venture between the government and the private sector. The SME bank then took on the role of assisting SMEs in securing sources of funding, preparing business plans, and providing advice on business operations.

In 2003, another key SME development in the first plan was the establishment of a venture capital fund worth Bt 5 billion, aimed at creating joint ventures with SME projects. The fund has worked in conjunction with an existing SME venture capital fund worth Bt 1 billion, established by the Democrat-led government. The latter is now managed by One Asset Management Corporation.

As for technical and management consultancy measures, the New Entrepreneurs Creation program (NEC), established under the Ministry of Industry in 2002, was another initiative intended to encourage people to create their own businesses. Under the NEC program, the SME bank provided business counseling and training to resolve problems and further develop participants' businesses. Combined with other measures, such as offering financial, production and marketing training as well as fund accessing advice, the plan had led to a gross increase of 226,757 new entrepreneurs, or an average of 44,550 per year during the plan. Although impressive, this figure was still behind the

target of 50,000 new entrepreneurs per year. During the whole plan, SME employment increased by 3.8 million persons, well above the target.

At the end of the first plan, SMEs' GDP accounted for 39.8% of aggregate GDP, a little below the target of 40%. In addition, growth in both SME value-added and exports was still below that of large enterprises. Judging from these key performance indicators, we could evaluate overall SME policies as being moderately successful. During this plan, government contributions to Thai SME development tended to focus on the areas of financial assistance, entrepreneurial activities, and access to information.

The current SME policy guideline is the Second SME Promotion Plan 2007-2011. The plan's vision is to promote SMEs to grow with continuity, strength and sustainability on the basis of knowledge and skills. In line with the first plan, the second plan aims to achieve three economic targets: for SMEs' share in GDP to become 42% during the plan; for SMEs' share of exports to grow on average faster than growth in total exports; and for total factor productivity of SMEs to increase by 3% per annum on average during the plan, including a growth in labor productivity to at least 5% per annum. The second plan continues to target some sectors for promotion, such as auto and electronic parts, software, logistics, healthcare, education, tourism, health-functional food, and rubber products.

Of the many measures employed in this plan, measures related to manufacturing SMEs include (1) product quality improvement; (2) establishing business incubators in regional and local areas; (3) trade fairs; (4) establishing exhibition centers for SMEs products throughout the country; (5) improving logistics or distribution channels; (6) creation of clustering and networks.

Many government offices and the private sector are involved in implementing the second plan. Besides formulating and evaluating the plan, the Office of SME Promotion (OSMEP) acts as the intermediary agency to propel and support the implementation of the plan. Government agencies involved in SME development implementation include the Ministry of Industry (MOI), Ministry of Commerce (MOC), Ministry of Tourism and Sports (MOTS), Ministry of Agriculture and Cooperatives (MOAC), and specialized agencies which focus on technological and human resource



development. For example, the SME Development Institute is responsible for training and development of the workforce.

There are also many supporting agencies involved in SME promotion. On financing, there are the SME Bank, and the Small Business Credit Guarantee Corporation providing credit and credit guarantees, as well as venture capital. On product standards, there are the Thai Industrial Standards Institute and the ISO Management System Certification Institute. On business consultation, there is the Office of SME Promotion. On business location, there is the Industrial Estate Authority of Thailand (IEAT), which promotes the establishment of industrial estates for SMEs. In addition, many private agencies are involved in implementing the SME promotion plan.

## **5.2. Assessment of Current Government Assistance and Support Programs**

The previous section reports a wide range of government support measures for SMEs in Thailand. In practice, this government support, including assistance from non-government organizations, is not well distributed, and access to these services may be too costly for many SMEs. Thus, it is important to examine whether support is adequately provided and effective, in the view of SMEs.

The survey classifies all support and assistance into 8 categories: (a) Training; (2) Counseling and advice; (3) Technology development and transfer; (4) Information; (5) Business linkages and networking; (6) Financing; (7) Overall improvements in investment climate; and (8) Others. Details of assistance in each category are shown in the Appendix 1. Each of these supporting programs is rated in terms of its degree of adequacy and effectiveness, using the 5-point Likert scale from 1 (extremely effective) to 5 (least effective).

Of the 77 SMEs responding to the survey, more than 50% of them report receiving assistance or support in each category (Table 8). Among these categories, market information is the most accessible for firms, followed by business linkage and networking; training; counseling and advice; technology development and transfer; and overall improvement in investment climate. Financing is rated as the least accessible. About 82% of respondents report receiving market information, while only 42% report

receiving financing support from the government. Further analysis indicates that financial support favors larger firms over smaller firms.

**Table 8. Assistancess from Government, NGOs, and others**

<b>Types of Assistance from Government, NGOs, and others</b>	<b>% of firms receiving given assistances</b>	<b>% of firms rating them as effective</b>
Market information	81.82	52.9
Business linkages and networking	74.03	57.1
Training	66.23	55.8
Counseling and advice	63.64	54
Technology development and transfer	55.84	56.1
Overall improvement in investment climate	50.65	62.5
Financing	41.56	43.6
Others	2.6	

*Source:* ERIA SMEs Survey, 2009.

More than half of the responding firms rate assistance they received between 'effective' and 'extremely effective'. The most effective programs, as evaluated by responding firms, are those for overall improvement in investment climate, followed by business linkages and networking programs, technology development and transfer programs, training, counseling and advice, market information, and financing.

The survey also revealed the overall perceived needs of SMEs in overcoming their barriers. Eight categories of assistance were presented to SMEs and rated. Table 9 shows that, during the period of the study, the responding firms viewed improving overall investment climate (e.g. political and macroeconomic stability, reduced corruption and bureaucratic barriers, fair competition, infrastructure etc.) as the most effective ways to overcome their barriers. This result is hardly surprising, and is likely to be specific to the time of this study. In 2009, Thailand has been in recovery from the 2008 global financial crisis and in domestic turmoil since 2006. The political instability, which leads to further deteriorating economic conditions, has proved to be very costly and is the biggest concern for businesses. Among assistance aimed at improving the investment and business environment, the greatest needs include the removal of

international trade barriers. In particular, non-tariff barriers such as restrictive health and safety, and technical, standards in foreign markets, were among the top-rated barriers facing exporting SMEs.

The next effective type of SME assistance was identified as programs focusing on helping firms to enhance technology development and transfer to SMEs, and programs providing information on markets. Despite the Thai government having put in place a variety of programs to help SMEs upgrade their technologies; the extent of support in this area seems to be quite limited. As shown earlier, assistance in this area was rated as 'not yet effective' and was less accessible by many SMEs. As for market information, programs focusing on improving more reliable market data and information for business partners were recommended, and perceived as the most effective and accessible ones. These results could imply that more government efforts and resources should be put into improving the technological capabilities of SMEs. Programs to provide access to market information were already quite effective, but can be extended to cover larger groups of SMEs.

**Table 9(a). Ranked Perception of Assistances Faced by SMEs from 1 (Highest) to 8 (Lowest) In / Out Production Networks**

Rank	All Sample	Production Network	
		In	Out
1	Overall improvement in business climate	Overall improvement in business climate	Technology development and transfer
2	Technology development and transfer	Technology development and transfer	Information
3	Information	Information	Overall improvement in business climate
4	Business linkage and networking	Business linkage and networking	Counseling/advice
5	Counseling/advice	Counseling/advice	Financing
6	Training	Training	Business linkage and networking
7	Financing	Financing	Training
8	Other	Other	Other

Source: ERIA SMEs Survey, 2009.

**Table 9(b). Ranked Perception of Assistances Faced by SMEs from 1 (Highest) to 8 (Lowest) Types of Business**

Rank	Type of Business		
	Clothing	Automotives	Electronics
1	Technology development and transfer	Technology development and transfer	Overall improvement in business climate
2	Overall improvement in business climate	Counseling/advice	Business linkage and networking
3	Information	Information	Information
4	Financing	Overall improvement in business climate	Technology development and transfer
5	Counseling/advice	Business linkage and networking	Training
6	Business linkage and networking	Training	Counseling/advice
7	Training	Financing	Financing
8	Other	Other barriers	Other barriers

Source: ERIA SMEs Survey, 2009.

The survey indicated that the top 3 perceived types of assistance were similar for all SMEs, regardless of their being in or out of production networks. They include improving business climate, technology development and transfer, and information on market and networks. Firms in production networks ranked the overall improvement in business climate as the most effective way of overcoming their business barriers. Firms outside production networks indicated government support for technology development and transfer to be the most effective assistance.

If we do not consider the need for improvements in investment climate, the results showed that SMEs in the clothing and automotive industries viewed government assistance with technology transfer and development to be the most important. This is followed by market information, and counseling and advice. As for electronics, firms viewed business linkages and networking as the most important, followed by market information and technology development and transfer. It is interesting that training and financing are always among the least important needs for all industries.

## **6. Conclusions and Policy Recommendation**

Rapid advancement of global production networks in Southeast Asia has widened the opportunities for SME participation. These networks have provided international knowledge diffusion, supporting capability formation of domestic suppliers, including SMEs. Integration into networks, however, requires many prerequisites and a change in mindset among most SMEs, away from traditional ways of operating a business. With these requirements in mind, policies aiming at promoting business networks and alliances, and industrial clusters, have been given high priority in recent Thai SME and industrial policies. Absorptive capacities of local suppliers are also crucial for reaping the benefits of deepening networks. Thus, policy towards upgrading productivity and innovative capability in manufacturing SMEs has also been emphasized along with industrial cluster and network development policies.

Recent Thai measures relevant to the enhancement of clusters, networks and productivities include (a) promoting business alliances and SME clusters; (2) Supporting the utilization of technological infrastructure and promoting linkages between technology creators and users; (3) Improving efficiency and productivity through improved management and skills; (4) Promoting readiness for trade liberalization to mitigate unfavorable impacts; (5) Upgrading the quality and standards of products to correspond with market demands.

Programs and measures promoting networks and linkages have been implemented by many facilitating agencies. To create concerted programs, the Office of SME Promotion (OSMEP) acts as the intermediary unit. So far, it has been active in coordinating all parties involved in SME promotion. Various types of SME assistance from the government were rated as 'quite effective', except for financing. As far as business linkage and network creation are concerned, almost two-thirds of responding firms reported receiving such assistance. However, there remains much work to be done.

First of all, Thailand urgently needs to improve its investment climate. At the moment, a stable and secure investment in Thailand requires political stability and clarification of regulations and enforcement. The suspension of many investment

projects in the Map Ta Phut industrial estate, due to health and environmental concerns, is a case in point. To send the right signal, the Thai government needs to enforce requirements, so businesses have to comply. Tax incentives could also be used to help firms in achieving desired environmental standards economically.

Second, Thailand needs to strengthen the absorptive capacities of SMEs with special attention given to technological capability development, and dissemination to SMEs. Although various technological capability-building programs have been provided by the Thai government, the survey findings indicate that more government support is still needed in this area. In particular, firms in production networks report a stronger lack of such government support. In addition, there is more room to improve the accessibility and effectiveness of these government supporting programs. Technological upgrading of Thai SMEs thus provides a basis for deepening networks and sustained competitiveness.

Third, Thailand will also need to keep raising the size and quality of its science and technology workforce. Shortage of skilled workers and research personnel increases domestic costs, and results in more difficulties with network participation and business expansion among SMEs.

Fourth, Thailand needs proactive support for networking between large enterprises and SMEs. Previous supporting activities were mainly limited to awareness-building and matching SMEs with MNEs. To create more meaningful programs, joint programs with MNEs for assisting promising suppliers are recommended. Establishment of long-term MNE-SME relationships calls for a strong commitment and vision from the Thai government to enhance the competitiveness of potential suppliers. Programs to incentivize large companies to support local partners may be necessary and worthwhile. Spillover effects from MNE activities could justify program costs.

Future policies for strengthening business linkages and the absorptive capacities of domestic SMEs will need to be exercised in a better-coordinated manner. The challenge for Thai policymakers is to develop more understanding of the source of benefits from enhanced inter-firm networking and linkages, the contexts which help facilitate it, and the right policy instruments to create it.

## References

- AIT/Asia Policy Research Consortium (2004) "Final Report on Building a World-Class Industry: Strengthening the Hard Disk Drive Cluster in Thailand." submitted to the National Science and Technology Development Agency, September.
- Altenburg, Tilman (2000) "Linkages and Spillovers between Transnational Corporations and Small and Medium-Sized Enterprises in Developing Countries- Opportunities and Policies." Reports and Working papers 5/2000, German Development Institute.
- Berry, Albert (1997) "SME Competitiveness: The Power of Networking and Subcontracting." Washington D.C. no. IFM-105.
- Ernst, Dieter and Limsu Kim (2002) "Global Production Networks, Knowledge Diffusion and Local Capability Formation." *Research Policy* 31: 1417-29.
- Gereffi, Gary and Olga Memedovic (2003) "The Global Apparel Value Chain: What Prospects for Upgrading by Developing Countries?" UNIDO, Vienna.
- Gereffi, Gary (1999) "International Trade and Industrial Upgrading in the Apparel Commodity Chain," *Journal of International Economics*, 48: 37-70.
- Hobday, Michael and Howard Rush (2007) "Upgrading the Technological Capabilities of Foreign Transnational Subsidiaries in Developing Countries: the Case of Electronics in Thailand." *Research Policy* 36:1335-1356.
- Kohpaiboon, Archanun (2009) "*International Production Network in Thailand Hard-Disk Drive Industry and Policy Implications.*" In *Symposium No. 32 Managing Globalization: Experiences from Thailand Industrial Sectors.* Bangkok, Faculty of Economics, Thammasat University.
- Kohpaiboon, Archanun (2008) "MNEs and Global Integration of the Thai Clothing Industries: Policy Implication for SME Development, ERTC discussion paper No. 8, Faculty of Economics, Thammasat University.
- Memedovic, Olga (2004) *Inserting Local Industries into Global Value Chains and Global Production Networks: Opportunities and Challenges for Upgrading with a Focus on Asia.* Austria: UNIDO.
- Poapongsakorn, Nipon and KriengkraiTechakanont (2008) "The Development of Automotive Industry Clusters and Production Network." In *Production Networks and Industrial Clusters: Integrating Economics in Southeast Asia*, ed. Ikuo Kuroiwa and Toh Mun Heng, IDE-JETRO, ISEAS publishing, Singapore.
- Punyasavatsut, Chaiyuth (2008) "SMEs in the Thai Manufacturing Industry: Linking with MNEs" In *ERIA Research Project Report 2007 No. 5: Asian SMEs and Globalization*, ed. Hank Lim, Jakarta: ERIA.
- Techakanont, Kriengkrai (2007) "Roles of Japanese Assemblers in Transferring Engineering and Production Management Capabilities to Production Network in Thailand." ERTC Discussion paper No. 2, Faculty of Economics, Thammasat University.

- Techakanont, Kriengkrai (2008) "The Evolution of Automotive Clusters and Global Production Network in Thailand." ERTC Discussion paper No. 6, Faculty of Economics, Thammasat University.
- UNCTAD (2002) *World Investment Report 2002: Transnational Corporations and Export Competitiveness*. United Nations.
- UNCTAD (2001) *World Investment Report 2001: Promoting Linkages*. United Nations.
- Wattanapruttipaisan, Thitapha (2002) "SME Subcontracting as Bridgehead to Competitiveness: Framework for An Assessment of Supply-side Capabilities and Demand-side Requirements." *Asia-Pacific Development Journal* 9, no. 1, June.



### Appendix I: Complete Results of Each Barrier from Likert-Scale Ranking

Rank	Mean	S.D.	Barrier	Description
1	1.99	1.3	B33_2	Restrictive health, safety and technical standards (Foreign Market)
2	2.01	1.2	B30_2	Political instability (Foreign Market)
3	2.03	1.27	B28_2	Poor/deteriorating economic conditions (Foreign Market)
4	2.22	1.34	B32_2	Inadequate property rights protection (Foreign Market)
5	2.23	1.35	B34_2	High costs of Customs administration, in exporting or importing (Foreign Market)
6	2.23	1.36	B30_1	Political instability (Home Market)
7	2.26	1.33	B28_1	Poor/deteriorating economic conditions (Home Market)
8	2.26	1.43	B31_2	High tax and tariff barriers (Foreign Market)
9	2.32	1.03	B19	Establishing and maintaining trust with business partners
10	2.43	1.19	B35	Perceived risks in your current and business operations
11	2.44	1.33	B29_2	Inadequacy of basic and IT infrastructure (Foreign Market)
12	2.48	1.07	B11	Meeting product quality/standards/specifications
13	2.48	1.38	B34_1	High costs of Customs administration, in exporting or importing (Home Market)
14	2.49	1.05	B2	Unreliable market data (costs, prices, market shares)
15	2.49	1.08	B5	Insufficient quantity of and/or untrained personnel for market expansion
16	2.49	1.29	B33_1	Restrictive health, safety and technical standards (Home Market)
17	2.6	1.05	B10	Adapting to demanded product design/style
18	2.61	1.17	B13	Offering technical/after-sales service
19	2.61	1.04	B18	Accessing a new production chain
20	2.65	1.13	B22	Participation in promotional activities to target markets/business partners
21	2.66	1.28	B15	Difficulty in matching competitors' prices
22	2.68	1.01	B9	Developing new products
23	2.69	1.28	B25	Lack of home government assistance/incentives
24	2.69	1.18	B21	Excess transportation/insurance costs
25	2.7	1.03	B36	Lack of the perceived benefits from joining production networks
26	2.71	1.27	B32_1	Inadequate property rights protection (Home Market)

27	2.71	1.16	B14	Offering competitive prices to customers
28	2.71	1.2	B1	Limited Information to locate/ analyze markets/ business partners
29	2.73	1.37	B31_1	High tax and tariff barriers (Home Market)
30	2.79	1.02	B29_1	Inadequacy of basic and IT infrastructure (Home Market)
31	2.82	1.08	B37	Willingness to adopt new business strategy or ideas
32	2.82	1.1	B16	Anti-competitive or informal practices
33	2.83	1.09	B6	Lack of production capacity to expand
34	2.83	1.2	B27	Unfavorable host/foreign rules and regulations
35	2.9	1.1	B17	Complexity of production value chain
36	2.95	1.24	B26	Unfavorable home rules and regulations
37	2.97	1.14	B24	Difficulties on enforcing contracts and resolving disputes
38	3	1.09	B12	Meeting packaging/labeling requirements
39	3.03	1.38	B7	Shortage of working capital to finance new business plan
40	3.04	1.04	B3	Inability to indentify and contact potential business partners
41	3.06	0.99	B4	Lack of managerial time to identify new business opportunities
42	3.06	1.17	B23	Unfamiliarity with complexity of procedures/paperwork
43	3.13	1.42	B8	Difficulty in getting credit from suppliers and financial institutions
44	3.38	1.41	B20	Unavailability of inventories/warehousing facilities

Source: ERIA SMEs Survey, 2009.

## CHAPTER 9

# **The Significance of Production Networks in Productivity, Exports and Technological Upgrading: Small and Medium Enterprises in Electric-Electronics, Textile-Garments, Automotives and Wood Products in Malaysia**

**RAJAH RASIAH<sup>1</sup>**

**MOHD ROSLI**

**PUVANESVARAN SANJIVEE**

University of Malaya

*This chapter assesses the impact of production networks on productivity, exports and technological upgrading of SMEs in the Malaysian electric-electronics, textiles-garments, automotive, and wood-products sector. It finds that whereas more integrated firms were showing higher production linkages domestically, less integrated firms showed higher export intensities. Among the technological variables that were significant, less integrated firms showed higher intensities those of the more integrated firms. Although more integrated SMEs appear to face more serious financial problems than the less integrated one, it is largely because of the latter being smaller than the former. The policy solution for Malaysian SMEs here then should be targeted at examining in greater detail the sources of finance accessed by the smaller SMEs. Given the positive results of domestic production networks, the Malaysian government should include the ex ante vetting, monitoring and ex post appraisal of SME conduct and performance using the domestic production network framework to better support them. In doing so it is also important to give greater weight to the specificity of each of the industries, because the nature of influence exerted by production networks tends to be different.*

---

<sup>1</sup> Corresponding author. A generous grant by ERIA is gratefully acknowledged.

## **1. Introduction**

For a wide range of reasons governments have promoted the development of small and medium enterprises (SMEs). Whereas industrial district exponents have viewed the role of governments as an important component - within a blend of markets and trust - (Brusco, 1982), neoclassical economists have argued that SMEs not only are the best allocators of resources but their development should be led by markets (Krueger, 1995). The new institutionalists hold markets as the superior institution. However, they argue that because of market failures arising from frequency, asset specificity and uncertainty, they consider that other modes of coordination such as command and trust are important to resolve the gaps left behind by markets (see Coase, 1937; Williamson, 1985; North, 1990). Evolutionary economists consider all institutions as equally important and the significance of size is considered to be influenced by the specificities of the industries involved, including the nature of technical change, sources of access to knowledge and actors involved. The latter is uneven, non-linear and often changes with circumstances and location (see Nelson, 2008).

Using evolutionary economic theory, this paper seeks to examine the impact of production networks on technology, and economic performance of SMEs in the Malaysian manufacturing industries of electric-electronics, textile-garments, automotives and wood products. Value chains play a specific role in particular sets of industries, as internalized multinational production networks, through outsourcing arrangements or through a combination of the three. Existing works on production networks have only documented the significance, new developments or transition in control over value chains (see Gereffi, 2002; Gereffi, Humphrey and Sturgeon, 2005). Hence, the key question the paper seeks to answer is whether the intensity of integration in production networks matters in both the technological intensity and economic performance levels of SMEs in Malaysian manufacturing.

This paper examines the impact of production networks in driving productivity, exports and technological upgrading in SMEs in electric-electronics,

textiles-garments, automotives and wood products industries in Malaysia. The rest of the paper is organized as follows. Section 2 discusses government policy targeted at supporting the development of SMEs. Section 3 presents the critical theoretical arguments on SMEs. Section 4 discusses the methodology and data used in the paper. Section 5 examines the descriptive statistics. Section 6 analyzes the impact of production networks controlling for other variables. Section 7 presents the conclusions.

## 2. Government Policy

SMEs have figured significantly in the industrialization initiatives in Malaysia. The earliest can be traced to colonial Malaya, where, since the 1950s, the British provided small loans through the Rural Industrial Development Authority (RIDA) in order to stimulate petty handicraft manufacturing (Jomo, 1986; Rasiah, 1995). The purpose of this initiative was to arrest support for the communist insurgency and hence the program did not achieve much success. The Malaysian government opened the Majlis Amanah Rakyat (MARA) as one of the strategies in the late 1960s to uplift the livelihood of *Bumiputeras*,<sup>2</sup> which *inter alia*, supported the development of Malay entrepreneurship. Such forays by the government were carried out through privately incorporated channels. It was only since 1975 through the Industrial Coordination Act (ICA) that the initiatives of the Malaysian government to implement the New Economic Policy (NEP) of 1971 that formal efforts to restructure the economy ethnically using regulatory measures were implemented. Formal SME programs have since mushroomed in several ministries before efforts were taken to integrate them under one body in 1996. These programs have had a bearing on the growth and performance of SMEs in Malaysian industrialization.

---

<sup>2</sup> *Bumiputera* literally translated means son or prince of the soil. The term was originally used to refer to Malays, but it has subsequently been extended to include the indigenous peoples of Malaysia, Malaysian Thais and the Eurasians and straits Chinese (Baba Chinese) with lineage to pre-colonial Malaya.

The ICA of 1975, inter alia, regulated ownership of industrial firms with paid up capital exceeding MYR250,000, and employment size exceeding 50 employees so that at least 30 percent Bumiputera equity is met. These floor stipulations were raised to MYR500,000 and 75 employees by 1980, and subsequently to MYR1 million and 100 employees before it was raised again to MYR2.5 million by the end of the 1980s (Chee, 1986). The floor stipulation of MYR2.5 million has remained since. Meanwhile foreign firms exporting over 80 percent of output were allowed to keep 100 percent of foreign ownership. As Malaysia has a small domestic market, foreign firms in manufacturing largely exported and hence did not find the ICA regulations stifling (see Rasiah, 1995). However, the expansion of non-*Bumiputera* local firms was considered to have been hampered by such regulations (see Jesudasan, 1987), many of which apparently had to hand out free gifts to find and attract *Bumiputera* partners (see Yoshihara, 1988).

The Government took on direct initiatives during the Dr Mahathir premiership throughout the period of 1981-2003 when government funds and strategies targeted the growth of industrial SMEs. The umbrella concept was introduced to nurture particularly *Bumiputera* SMEs with Proton (backward linkages) and Perwaja Steel (forward linkages) becoming key targets. Firms offering tenders to supply components and parts to Proton and to use wire rods from Perwaja Steel were required to show at least 51 percent *Bumiputera* ownership. Given that these firms supplied largely to the domestic market, they came under the customs regulations of the principal customs area and hence the ICA regulations involving industrial firms selling less than 80 percent of their output in Malaysia.

Following criticism of the first Industrial Master Plan (IMP) of 1986 and the Second Industrial Master Plan (IMP2) of 1996 over the growth of multinationals in key export-oriented industries such as electric-electronics and textile and garments as being truncated with little linkages in the domestic economy, the government introduced the Subcontract Exchange Scheme to stimulate linkages. Electronics multinationals in particular took on the project seriously to not only access incentives, but also to see it as an integral part of their policy to cheapen costs and make manufacturing flexible. Arguably, using detailed studies of production transitions and the evolution of regional and proximate production networks, Rasiah (1988a, 1988b) had argued that the time

then was ripe for host-governments to take advantage of these developments to promote the growth of local supplier firms. The key argument is that the multinationals were then seeking to develop suppliers to support their own self-expansion plans. In Penang in particular, suppliers to electronics multinationals expanded several times between 1980 until 1993 (see Rasiah, 1994, 1996). However, only Penang demonstrated a successful expansion of suppliers in the industries of machine tools, plastic molding and packaging, largely benefiting from a surge in proximate demand from electronics multinationals implementing flexible production techniques.

Meanwhile, government promotion of SMEs expanded into other manufacturing industries, including food processing and wood products (Malaysia, 1996). SME products were included in Malaysia's exhibitions and promotions abroad through MATRADE's activities. Whereas the depletion of timber, and cane and bamboo has led to a relative contraction of the latter, the promotion of food processing has expanded considerably with palm oil and oleo-chemical products becoming important (Jaya Gopal, 2001; Rasiah, 2006).

The uneven growth of suppliers only in industries complementary to electronics, and only in Penang, led the government to review its SME policies. After much deliberation on the IMP2 the government introduced the Small and Medium Industries Development Corporation (SMIDEC) in 1996. It was felt that the corporatist outlook as well as the integration of all SME activities under one body within the Ministry of International Trade and Industry (MITI) will help rationalize and synergize SME promotions. Because of the problems of funding faced by new start ups and small SMEs, the SME Bank was introduced in 2006 to provide special interest based loans to qualifying SMEs. SMIDEC was subsequently transformed into an SME Corporation in 2009.

The new initiatives were helpful in that they helped provide both advisory as well as more effective support for SMEs as connections and coordination between entrepreneurs were linked much better with the *meso* organizations the government launched to stimulate the growth of SMEs. However, the mid-1990s proved a turning point as the growth of suppliers in Penang plateaued and subsequently began to contract. The lack of human capital and government indecision over leveraging strategies recommended by the IMP2 caused a hollowing out effect in the electronics

industry in Malaysia. Denied the capacity to upgrade into higher value added activities, several foreign firms either relocated operations to cheaper cost sites endowed with larger labor reserves such as China and Vietnam or scaled down their operations in Malaysia. The remaining flagship multinationals began to either use largely foreign labor in low-end assembly activities (e.g. Flextronics and Western Digital) or upgraded into designactivities (e.g. Intel and Motorola) or fabrication activities (e.g. OSRAM). Unfortunately the lack of human capital has restricted the latter to a handful of firms (see Rasiah, 2010).

Nevertheless, proactive support from the government has helped support the growth of SMEs in Malaysia. The share of SMEs has risen considerably over the 1996-2008 period. The government's policy to promote SMEs as well as the slowdown in the foreign MNC-led sector were instrumental in the relative expansion of the SME share in overall manufacturing value output, value added and employment (see Table 1). The contribution of SMEs in manufacturing output, value added and employment in Malaysia rose from 22.1, 19.5 and 29.6 percent respectively in 1996 to 29.6, 25.9 and 31.1 percent respectively in 2005 and 30.9, 26.5 and 31.8 percent respectively in 2008. Both output and value added of manufacturing SMEs grew faster on average in 2005-2008 than over the period 1996-2005. Only the number of establishments grew more slowly in the latter period.



**Table 1. Contribution of SMEs in Manufacturing, Malaysia, 1996-2005**

Indicators	1996	2005	2008
Total Output			
Value (RM billion)	51.5	81.9	100.3
% Share of the manufacturing sector	22.1	29.6	30.9
Average Annual Growth		5.3*	6.3#
Added Value			
Value (RM billion)	10.1	16.6	20.5
% Share of the manufacturing sector	19.5	25.9	26.5
Average Annual Growth		5.7*	6.5#
Number	329,848	394,670	420,917
% Share of the manufacturing sector	29.6	31.1	31.8
Average Annual growth		2.0*	1.8#

*Note:* \* - Average annual growth rate for 1996-2005; # - Average annual growth rate over 2005-2008; Growth rates computed using 2000 prices. Source: [http://www.smidec.gov.my/pdf/SME\\_Performance\\_Report\\_2005.pdf](http://www.smidec.gov.my/pdf/SME_Performance_Report_2005.pdf); <http://www.smeCorp.gov.my/sites/default/files/SME%20AR08%20Eng%20Text.pdf>

Hence, it can be seen that both government promotion as well as the contribution of SMEs in Malaysian manufacturing have been important since the 1970s, particularly during Mahathir's premiership between 1981 until 2003. In light of this development it will be interesting to examine the dynamics of SMEs growth and expansion in Malaysian manufacturing. Due to the significance of both export-oriented as well as import-substitution manufacturing in the country, and on the basis of the special programs introduced to target growth, the industries of electric-electronics, textiles-garments, and automotives and wood products are chosen for analysis in the paper.

### 3. Theoretical Guide

Industrial organization economists argue that minimum scale efficiencies vary with industries as the long run average cost curves of firms are determined by the scale involved (Pratten, 1971; Scherer, 1980). Firms are expected to expand production so long as marginal revenue is equal to or greater than marginal cost. Hence, there is a tendency for industrial organization economists to support large size, especially when it involves heavy industries such as automobiles and steel. However, industrial district (see Wilkinson and You, 1994; Marshall, 1890; Piore and Sabel, 1984; Rasiah, 1994;

Sengenberger and Pyke, 1992) exponents argue that SMEs are better allocators and coordinators of resources and production owing to the latter's size flexibility and agility to enter and exit markets.

Unlike the impersonal large firm, SMEs are considered to provide greater room for horizontal relationships that support trust and social capital. Audretsch (2002, 2003) and Acs & Audretsch (1988) produced evidence from the USA to argue that SMEs participate more in R&D activities than large firms. Unlike the dynamic methodology used to capture relationships by industrial district exponents, Audretsch (2002) and Acs & Audresch (1988) used statistical evidence to argue over the allocative and flexibility advantages of small firms. Given the strength of the arguments above, it is worth exploring this debate using empirical evidence from a region endowed with strong basic infrastructure but poor high tech institutions without specifying one size to be superior to the other. The assessment will also allow comparisons with Rasiah & Asokkumar's (2007) findings in Malaysia as a whole where larger firms reported higher human resource and process technology intensities.

Within the SME literature production networks have become increasingly important as intra-industry linkages with considerable decomposition of value chains and significant parts of these segments have been outsourced. Production networks have particularly been important in East Asia with Taiwan, China, Singapore, Malaysia, Thailand, Indonesia, Philippines, Vietnam and Cambodia figuring strongly in global value chains (Gereffi, 2002). However, active domestic intra-industry linkages have largely been important with strong horizontal participation in high value added activities by local firms in Japan, Taiwan, Korea, Singapore, Hong Kong and China among the East Asian nations (see Rasiah, 2003). Fukunari (2002, 2006) had documented the growth and influence of production networks on economic performance in Japan and East Asia. Indeed, in particular industries connecting in global value chains appear to be the initial route to technological catch up (see Mathews, 2006). Hence, the focus of this paper is on production networks intensity, and its influence on economic performance and technological intensities.

## 4. Methodology

This section introduces the methodology used for examining the impact of production networks on technology and economic performance while controlling for firm-specific variables. Given the usual sequence of examining differences and relationships statistically, the paper will first examine descriptive statistics followed by two tail tests comparing the means of critical technology and economic performance variables differentiated by the degree of integration in production networks. The subsequent analysis will focus on statistical determinants of the key technology and performance variables controlling for size, ownership and age.

As identified in the theoretical guide, productivity and export-intensities are important economic performance variables, while technological intensity is a key explanatory variable. Hence, these three variables are the critical dependent variables that will be examined in the paper. The variables of ownership, size and age will be used as control variables. In addition, technological intensity will be used as the key explanatory variable in the economic performance regressions. The variables on technology have been estimated using embodied logic in the manner initiated by Lall (1992, 2001) but without a focus on investment capabilities.

The key differentiating variable used is the production network intensity (PNI) dummy. PNI is defined by the share of inputs in overall inputs drawn from domestic suppliers and the share of outputs sold to buyer firms for further processing and assembly. Sales to wholesalers (and retailers) and exports, and imports were excluded from the numerator of the PNI variable.

Because of the use of 500 as the dividing employment figure of SMEs in some countries, e.g. the United States and Japan, the selection of SMEs in the sample takes account of this figure rather than the Malaysian cut-off size of 150 employees. Nevertheless, interpretations are made of the impact of production networks by size categories, which will help capture both effects and its consequent implications for policy in Malaysia.

## **Specification of Variables**

The variables used in the paper are specified in this sub-section. The firm-level variables defined refer to labour productivity, export intensity and technological intensity. Size is also an important explanatory variable. The control variables of size, ownership and age are also defined here.

### **Labor Productivity**

Labor productivity is used as one of the key economic performance variables. As the questionnaire used in the survey did not draw out investment or capital data, no attempt is made to estimate total factor productivity. Besides, we believe the controversy of the efficacy of TFP as a technology variable is real. Hence, we do not regard its avoidance to raise questions on the strength of the arguments. It was measured as:

$$\text{Labor productivity} = \text{VA}/\text{L}$$

Where VA and L refer to value added and workforce respectively. VA is estimated in US dollars.

### **Export Intensities**

Firm level performance is estimated using export-intensity (X/Y), which is measured as follows.

$$\text{Export Intensity} = X_i/Y_i$$

X and Y refer to exports and total gross output respectively of firm *i* in year 2004. Taking into account the fact that India is among the top five exporters of garments in the world, we expect export intensity levels to be encouraging. Both local and foreign owned large firms in the sample recorded higher export levels than SMEs (see Table 2)

### **Technological Capabilities**

Drawing on Rasiah (2009), technological intensity (TI) was measured by incorporating the three proxies of Human Resource (HR), Process and Product

Technology (PPT) and R&D (RD) intensities. The three indexes helped the estimation of firm-level embodied technology.

### **Human Capital**

Human capital (HC) were measured as follows:

$$HC = \text{Professionals and technical personnel in workforce}$$

### **Training Expenditure**

Training expenditure (TE) is measured as follows:

$$TE = \text{training expenditure/sales}$$

### **Process Technology**

Process technology (PT) intensity refers to process technology competency of firms, and is expected to have a positive relationship with export intensity. PT is measured as follows:

$$PT = \text{Cutting edge inventory, process and quality control techniques of firm } i,$$

PT is estimated by adding the following cutting edge process techniques: materials requirement planning (MRP), materials resource planning (MRP1), integrated materials resource planning, statistical process control (SPC), quality control circles (QCC), total preventive maintenance, small group activities, ISO9000, ISO 14000, just-in-time (JIT) and quality standard (QS).

### **Research and Development**

Higher levels of R&D (RD) intensity are expected to be correlated with higher levels of economic performance. Hence, we estimate RD as follows:

$$RD = RDEX_i$$

Where RDEX refers to proportion of R&D expenditure to sales.

## Technological Intensity

TI, is estimated by using the formula:

$$TI_i = HR_i + TE_i + PT_i + RD_i$$

Given no *a priori* arguments on the greater significance of any one of the three technological capabilities, and since their significance is likely to vary with the location of firms in the overall technological trajectories (see Rasiah, 2004), no attempt is made to weight them. The variables on the right hand side of the formula were added through the following formula:

$$\text{Normalization Score} = (X_i - X_{\min}) / (X_{\max} - X_{\min})$$

Where  $X_i$ ,  $X_{\min}$  and  $X_{\max}$  refer to the *i*th, minimum and maximum values of proxy X respectively.

## Control Variables

Four control variables were used in the econometric regressions, *viz.*, production network intensity, size, ownership and age. Throughout the regressions, production network intensity is the key differentiating variable

## Production Network Intensity

Intra-industry purchases and intra-industry sales as a share of overall sales and purchases were used as the basis for differentiating firms in two groups, one with high production network intensity (PNI) and the other with low PNI.

$$PNI = \frac{[\text{Domestic intra-industry sales} + \text{domestic intra-industry purchases}]}{[\text{Sales} + \text{Purchases}]}$$

Separate regressions were run for high and low PNI using the following classification:

PNI=1 when the PNI score exceeds the median figure; otherwise PNI=0.

## **Size**

Throughout the thesis, size is the key differentiating variable and is represented by the fulltime workforce number of the firm. Because the simple use of actual employees did not produce a significant result, a dummy variable was used to classify size as small and medium enterprises (SME), and large enterprises, and was measured as:

$$\text{SME} = 1 - 200 \text{ employees} = 0;$$

$$\text{Large firms} = 201 \text{ and above employees} = 1$$

## **Age**

Age is simply measured here as follows:

$$A_i = \text{Number of years since establishment}$$

Age is expected to be positively correlated to export performance and technological capabilities as it is believed that firms over time gather the required knowledge and technological knowhow to perform better than the new start ups.

However, there are also arguments that new firms will find it more convenient to begin their production with the already existing superior technology, or that foreign firms which located recently will bring with them superior technology and will have better access to foreign markets (Rasiah, 2004). In view of the conflicting findings in the past, a neutral hypothesis is assumed at this stage.

## **Foreign Ownership**

There are only five joint venture firms in the sample and all five firms had a minimum equity of 10 percent of overall equity. The 10 percent equity level is acceptable as foreign equity in Indian firms is generally low. Furthermore, it is believed that even small amounts of foreign equity have some influence over the conduct of firms. Foreign ownership is measured as follows:

$$\text{Own}_i = 1 \text{ for firms with a minimum foreign equity of 50 percent and above}$$

$$\text{Own}_i = 0, \text{ if otherwise}$$

Due to the greater reach of foreign firms in global markets (Hirschman, 1970; Dunning, 1974), foreign ownership is expected to be positively correlated with export-intensities. The World Investment Report 2005 (UNCTAD 2005) had reported that R&D by foreign firms is highly concentrated in home countries. Lall (1992) showed evidence that firms tend to develop only process R&D in the host country. In another study, Rasiah & Gachino (2005) showed a positive relationship between foreign firms and technological intensities in Kenyan manufacturing firms. Thus, we can expect both a positive and negative relationships between foreign ownership and technological intensities.

### ***Data***

Data was collected over the period November 2009 until February 2010. Using a sampling frame drawn from the Department of Statistics (DOS), the breakdown of industry was drawn on the basis of manufacturing value added, size and ownership. The sample is dominated by electric-electronics firms, which contributed over 26 percent manufacturing value added in Malaysia in 2008. This was followed by automotives, textiles and garments and finally wood products (see Table 2). A correlation test was done between the variables and the results, and is presented in the Appendix.

**Table 2. Breakdown of Firms by Industry, Sample, Malaysia, 2008**

Industry	Firms
Automotives	24
Textile and Garments	10
Electric-Electronics	63
Wood Products	6
Total	103

*Source:* ERIA-Malaysia Survey (2009-10).

### ***Specification of Econometric Models***

The final evaluation carried out uses econometric models to examine differences in economic performance and technology variables controlling for industry-based, size-based, ownership-based and age-based influences. The following basic equations were estimated:



$$\text{OLS: } VA/L = TI+X/Y+ PNI+ Own+Size+Age \quad (1)$$

Where VA, L, TI, X, Y, PNI, Own, Size and A refer to value added, workforce, technological intensity, production network intensity, ownership, size and age respectively of firm i.

$$\text{Tobit: } X/Y \text{ TI} = PID + Own + Size + Age \quad (2)$$

Where VA, L, TI, X, Y, PNI, Own, Size and Age refer to value added, workforce, technological intensity, production network intensity, ownership, size and age respectively of firm i.

$$\text{Tobit: } TI = X/Y + PNI + Own + Size + Age \quad (3)$$

A second set of regressions were run using the probit model to predict if production network intensities mattered in economic performance and technological intensities. The following probit models were estimated:

$$\text{Probit: } PNI=1, PNI=0; = VA/L + Own + Size + Age \quad (4)$$

Where VA, L, TI, X, Y, PNI, O, S and A refer to value added, workforce, technological intensity, production network intensity, ownership, size and age respectively of firm i.

$$\text{Probit: } PNI=1, PNI=0; = X/Y + Own + Size + Age \quad (5)$$

Where VA, L, TI, X, Y, PNI, Own, Size and Age refer to value added, workforce, technological intensity, production network intensity, ownership, size and age respectively of firm i.

$$\text{Probit: } PI=1, PNI=0; TI + Own + Size + Age \quad (6)$$

## 5. Descriptive Statistics

The results of the univariate tests of means, medians, standard errors, standard deviation and the number of observations are presented in Tables 2 and 3. Also examined are two-tail 'Z' statistics comparing the means between firms in group one

with PNI scores of the median and below, and group two with PNI scores of above the median. The variances between the two PNI groups were different and hence the comparison relied on unequal variances statistics. Except for nominal sales growth figures, the responses for the rest of the variables are either complete or almost complete. The final sub-section examines barriers and potential solutions to them by the two PNI groups.

### **Univariate Analysis**

The basic indicators shown in Table 3 were statistically significant using the one-tail test. Although the range between means and medians in some cases were wide, all the means are statistically significant at the 1 percent level of significance. This data is largely targeted at ensuring the validity of statistics used in the paper.

The mean and medians of the control variables of age were 16.9 and 17.0 years respectively, which is almost the same. The foreign equity mean ownership figure estimated using percentages rather than actual totals was 21.8 percent (see Table 3). The median was 0 percent demonstrating domination by local capital among SMEs in Malaysian manufacturing. The mean employment figure was 143 employees with the median being 91 employees. The largest employer had 500 employees while the smallest had 3 employees.

On average the sampled SMEs recorded sales of US\$14.7 million in 2008. The median sales figure was US\$3.4 million. The maximum and minimum sales figures recorded were US\$488. Million and US\$10,000 respectively. The mean and median value added recorded in 2008 were US\$2.7 million and US\$0.6 million respectively in 2008. The maximum and minimum value added recorded were 146,000 and 3,000 respectively. The mean and median share of value added in output 24.1 and 20.6 percent respectively.

Among the small number of firms reporting interest rates on loans, the mean and medians were 4.6 and 5.0 percent respectively in 2008. The highest loan reported was 10 percent and the lowest was 0 percent enjoyed by firms with support from government. By and large, these interest rates are low when compared to global rates.

The mean and median imports in purchases were 36.0 and 33.0 percent respectively in 2008. These figures tend to be much lower than large export-oriented firms (see

Rasiah, 2009). The mean and median export intensities of SMEs were higher at 49.0 and 58.2 percent respectively. To some extent higher export-intensities seem to support backward linkages in Malaysia.

The share of technical and professional staff in the workforce was fairly high in the SMEs as the mean and median figures were 46.7 and 54.0 percent respectively (See Table 4). The breakdown of mean percentage share of finance from own equity (including retained earnings) and banks was 27.5 and 25.0 percent respectively in 2008. The remainder was either from suppliers or buyers or other financiers. The commensurate median shares were 15.0 and 12.0 percent respectively. The smaller firms tend to figure less in the formal systems and equity among the SMEs.

Some technology scores were very impressive while others fell short. The mean incidence of use of the standards of ISO9000 (manufacturing practices) and ISO14000 (environmental practices) were 0.8 and 0.3 respectively. The commensurate medians were 1.0 and 0.0 respectively. With the maximum and minimum scores of 1 and 0, the incidence of ISO9000 was high while that of ISO14000 was low. In terms of cutting edge inventory and quality control systems, the mean scores were 1.6 and 2.0 respectively out of a maximum and minimum score of 5 and 4 respectively. The mean training and R&D expenditure in sales was 1.6 and 1.2 percent respectively. The commensurate medians were 0.6 and 0.4 respectively. The latter figures were low. The overall technology intensity (TI) index was low with a mean of 0.26 and a median of 0.24. Several SMEs, especially the micro firms, neither invested on training nor on R&D.

**Table 3. Basic Statistics, Malaysia, 2008**

	Age	FO	Sales (US\$)	Growth (2007-08)	VA (%)	VA (\$US)	VA(\$US)/L	Interest	Employees	Import*	Export#
Mean	16.9	21.78	14,653,858	8.8	24.1	2,709,045	15,735	4.6	143.0	36.0	49.0
Median	17.0	0	3,402,154	7.7	20.6	626,752	8,368	5.0	91.0	33.0	58.2
Std Dev	8.9	41.48	50,905,427	13.9	15.5	7,962,768	22,578	3.4	140.9	31.0	34.8
Std Error	0.9	4.13	5,015,861	1.5	1.5	784,595	2,225	1.1	13.9	3.1	3.4
Minimum	0	0	10000	-35.7	4.7	3,000	142	0	3	0	0
Maximum	41	100.00	488,567,707	72.6	86.0	63,513,802	146,345	10	500	100	100
N	103	101.00	103	88	103	103	103	10	103	101	103

*Note:* VA – value added; L – workforce; N – number of observations; Share of imports in inputs (%); # Share of exports in output (%). Source: Compiled from ERIA (2009).

**Table 4. Finance and Technology Statistics, Malaysia, 2008**

	HC	Finance		Standards		Systems		In Sales		TI
	Index	Equity*	Banks	ISO9000	ISO14000	Inventory	Quality	TE	RD	
Mean	46.7	27.5	25.0	0.8	0.3	1.6	2.0	1.6	1.2	0.26
Median	54.0	15.0	12.0	1.0	0.0	2.0	2.0	0.6	0.4	0.24
Std Dev	35.1	33.3	32.1	0.4	0.5	1.2	1.7	3.0	3.1	0.17
Std Error	3.5	3.3	3.2	0.0	0.0	0.1	0.2	0.3	0.3	0.02
Minimum	0	0	0	0	0	0	0	0	0	0
Maximum	100	100	100	1	1	5	5	20	25	0.63
N	103	103	103	103	103	103	103	103	103	101

*Note:* HC – human capital refers to share of professionals and technical personnel in workforce; Includes retained earnings; OEM – original equipment manufacturing; ODM – original design manufacturing; OBM – original brand manufacturing; TE – training expenditure; RD – R&D expenditure in sales.

*Source:* Compiled from ERIA (2009).

### **Comparison by Production Network Intensities**

We use the 2-tail Z-tests to examine differences in firm-level characteristics between more integrated and less integrated in domestic production networks. The median of the PNI variable was used to separate the two groups of firms. Some of the characteristics were statistically significant for interpretation.

As shown in Table 5 industry size category and employment numbers were statistically highly significant at the 1% level. Age, industry, ownership, sales, value added, labour productivity and type of funding were statistically insignificant. The more integrated firms with higher PNI scores show lower employment levels than the less integrated firms.

The structure of integration of firms in domestic production networks is shown in Table 6. Except for distance from export processing zones (EPZs), all the results were statistically highly significant (at 1% level). The mean percentage of purchases from local SMEs, local large firms and other domestic suppliers was much higher among the more integrated firms (21.9%, 47.5% and 83.0%) than in the less integrated firms (4.9%, 19.1% and 44.9%). The more integrated firms imported less (17.4%) than the less integrated firms (55.0%).

As is to be expected, the more integrated firms (68.6%) sold more in the domestic market than the less integrated firms (33.1%) (See Table 6). Intra-industry sales were also higher in the more integrated firms (52.6%) than in the less integrated firms (23.9%). The higher amounts of sales in the domestic market meant that the more integrated firms (31.4%) exported less than the less integrated firms (66.9%). Distance from EPZs did not matter at all in the levels of integration in domestic production networks.

**Table 5. Integration in Domestic Production Networks and Basic Characteristics Malaysian Sample, 2008**

	<b>PNI=0</b>	<b>PNI=1</b>	<b>Z-stats</b>	<b>p-value</b>
<b>Age</b>	17.57	16.19	-0.7774	0.4369
<b>Industry</b>	2.43	2.71	1.4958	0.1347
<b>Size</b>	3.94	2.88	-4.5557*	0.0000
<b>Own</b>	0.27	0.17	-1.1130	0.2657
<b>Sales (US\$)</b>	13,939,351	15,354,624	0.1415	0.8875
<b>Value Added (US\$)</b>	2,894,515	2,527,143	-0.2336	0.8153
<b>Value Added/Employment (US\$)</b>	12144.09	19256.76	1.6175	0.1058
<b>Employment</b>	193.37	93.56	-3.8165*	0.0001
<b>Equity and Retained Earning</b>	24.84	30.06	0.7927	0.4279
<b>Banks</b>	24.16	25.88	0.2700	0.7872
<b>Other financiers</b>	4.18	3.12	-0.4194	0.6749
<b>Others</b>	45.65	40.18	-0.6536	0.5134

*Note:* \* refers to statistical significance at the 1% level.

*Source:* Computed from ERIA Survey (2009-2010).

**Table 6. Integration in Domestic Production Networks, and Sales and Purchase Structure, Malaysian Sample, 2008**

	<b>PNI=0</b>	<b>PNI=1</b>	<b>Z-stats</b>	<b>p-value</b>
Local SMEs	4.90	21.92	2.773*	0.006
Local Large Firm	19.09	47.45	5.017*	0.000
Other Domestic Suppliers	44.93	83.01	7.843*	0.000
Imports	54.97	17.38	-7.615*	0.000
Domestic Sales	33.09	68.60	5.991*	0.000
Intra-Industry Sales	23.88	52.63	5.202*	0.000
Exports	66.91	31.40	-5.991*	0.000
Distance from EPZs	3.82	4.94	0.571	0.568

*Note:* \* refers to statistical significance at the 1% level.

*Source:* Computed from ERIA Survey (2009-2010).

Most technological variables did not show statistically significant differences against levels of integration in domestic production networks (see Table 7). Nevertheless, the overall technological intensity (TI) – which took account of the critical variables of inventory and quality systems, skills intensity, training expenditure in sales and R&D expenditure in sales – was statistically significant at the 5% level. Less integrated firms showed higher TI than more integrated firms, though the difference was small.

Less integrated firms showed higher incidence of participation in cutting edge inventory and quality control systems than the more integrated firms. The incidence of application of ISO9000 series and Materials Requirement Planning (MRPI) in less integrated firms was higher than in more integrated firms (see Table 7). Less integrated firms (22.7% and 24.7%) also showed higher intensity of vocational qualifications in workforce and marketing expenditure in sales than more integrated firms (15.9% and 16.0%).



**Table 7. Integration in Domestic Production Networks and Technological Intensities, Malaysian Sample, 2008**

	<b>PNI=0</b>	<b>PNI=1</b>	<b>Z-stats</b>	<b>p-value</b>
Technical and Professional Staff in Workforce	51.27	42.32	-1.302	0.193
Tertiary Qualifications	28.56	28.09	-0.091	0.927
Vocational Qualifications	22.70	15.91	-1.950**	0.051
High School Education	48.57	52.69	0.585	0.559
ISO9000	0.92	0.69	-3.058*	0.002
ISO14000	0.27	0.33	0.575	0.565
JIT	0.51	0.38	-1.275	0.202
QS	0.12	0.17	0.793	0.428
MRP	0.06	0.08	0.362	0.717
MRP1	0.73	0.54	-1.987**	0.047
MRPII	0.25	0.13	-1.542	0.123
Cellular Manufacturing	0.18	0.16	-0.187	0.852
Inventory Control Systems	1.80	1.46	-1.441	0.150
Quality Control Systems	2.27	1.73	-1.647***	0.100
Original Equipment Manufacturing	1.24	1.14	-1.269	0.204
Original Design Manufacturing	1.49	1.55	0.590	0.555
Original Brand Manufacturing	1.90	1.88	-0.283	0.778
Research and Development in Sales	1.58	0.79	-1.268	0.205
Training Expenditure in Sales	1.93	1.24	-1.196	0.232
Marketing Expenditure in Sales	24.72	16.02	-2.383**	0.017
Technological Intensity	0.30	0.26	1.960**	0.038

*Note:* \*, \*\* and \*\*\* refers to statistical significance at the 1%, 5% and 10% level.

*Source:* Computed from ERIA Survey (2009-2010).

## Barriers and Potential Solutions

The firms in the sample were asked to identify the barriers that they consider to have inhibited further improvements in their performance, as well as, what they thought as strategies that could help them overcome them. Likert scale scores ranging from 1 to 8 were given starting with 1 as the highest and 8 as the lowest. The means are presented in Tables 8 and 9.

Differences in the means on information, distribution, logistics and promotion, tax, tariff and non-tariff barriers were statistically significant, while the others were not. Among the significant results other barriers was the most significant at 1% followed by distribution, logistics and promotion barriers at 5% and information barriers at 10% (see Table 8). The less integrated firms with PNI=0 showed higher importance with lower means than the more integrated firms. The big gap in means between less and more integrated firms in the others category suggests that the former are facing more serious barriers than more integrated firms.

**Table 8. Integration in Domestic Production Networks and Barriers Faced, Malaysian Sample, 2008**

	PNI=0	PNI=1	Z-stats	p-value
Information Barriers	4.25	4.72	1.646***	0.100
Functional Barriers	4.29	4.70	1.474	0.141
Product and Price Barriers	4.06	3.98	-0.281	0.779
Distribution, Logistics and Promotion Barriers	3.92	4.58	2.367**	0.018
Procedural Barriers	3.90	4.03	0.413	0.679
Business Environment Barriers	4.19	4.23	0.109	0.914
Tax, Tariff and Non-tariff Barriers	4.75	5.35	2.103**	0.036
Other Barriers	4.64	6.23	5.045*	0.000

Looking at the reverse by examining potential solutions that can overcome barriers, counseling and advice, finance and others were statistically significant (see Table 9). The lower means of counseling and advice and others for less integrated firms compared to the more integrated firms show that they are more important among the former than the latter. Interestingly, finance as a solution was rated more highly by the more integrated firms. Because smaller firms are more immersed in domestic intra-industry production networks it may also be a problem of being small.

**Table 9. Integration in Domestic Production Networks and Potential Solutions to Barriers, Malaysian Sample, 2008**

	<b>PNI=0</b>	<b>PNI=1</b>	<b>Z-stats</b>	<b>p-value</b>
Training in General Management	4.50	4.22	-0.923	0.356
Counseling and Advice	4.64	5.50	3.020*	0.003
Technology Development	5.36	5.02	-1.089	0.276
Information on Markets	5.09	5.33	0.760	0.447
Business Linkages and Networks	4.58	4.05	-1.304	0.192
Finance	4.75	4.05	-1.970**	0.049
Overall Investment Climate	4.66	4.77	0.344	0.731
Others	5.39	6.35	2.861*	0.004

Overall, the univariate and two-tail ‘Z’ tests produced some interesting results. However, the differences in means of the two groups of a number of variables of firms drawn by domestic production network intensity were not significant. PNI did not matter in sales, value added and labour productivity as the differences were not statistically significant. It mattered strongly in the intra-industry and the types of purchasers domestically and exports. Whereas more integrated firms were showing higher production linkages domestically, less integrated firms showed higher export intensities. Among the technological variables that were significant, less integrated firms showed higher intensities than more integrated firms. More integrated firms reported higher incidence of barriers and potential solutions than less integrated firms among the statistically significant differences in the means.

## **6. Statistical Analysis**

The previous section examined the basic characteristics and statistical significance of differences in means between groups of firms divided by levels of integration in domestic production networks. This section is devoted to testing statistical relationships to examine the relationship between the dependent and independent variables in the first sub-section, and the significance of PNI on the critical explanatory variables in the second sub-section.

### ***OLS and Tobit Results***

The first set of analysis established statistical relationships using OLS and Tobit regressions. The results were significant for interpretation (see Table 10). The F-stats for the OLS regression on VA/L, and the log-likelihood test for the Tobit regressions of X/Y, TI and TE were statistically significant. All results are controlled for industry dummies.

TI was the only independent variable statistically significant in the VA/L regression (see Table 10) demonstrating the importance of technology on productivity. Interestingly the results also show that export-intensity, size, ownership and age did not matter on productivity.

TI and Size were statistically significant in the export-intensity regression. The positive correlation between TI and X/Y shows that technological intensity levels matter in export markets. The statistically highly significant and positive coefficient of size shows that larger size matters among SMEs in export markets. Ownership and age did not seem to matter in export markets.

The key findings in this section are that TI is important in both productivity and export-orientation. Size is important in the export-intensity, TI and TE regressions. The positive correlations involving size shows that bigger size among SMEs matters when it comes to exporting and showing higher intensities of training and overall technology.

**Table 10. Multiple Regressions on Economic Performance and Technology, Sampled Firms, Malaysia, 2008**

	OLS	Tobit		
	VA/L	X/Y	TI	TE
C	12368.6 (2.016)**	0.019 (0.171)	0.223 (6.263)*	0.241 (0.278)
X/Y	-10404.9 (-1.409)		0.083 (1.642)***	0.026 (0.022)
TI	34941.0 (2.371)**	0.537 (2.116)**		
OWN	5488.9 (0.896)	0.143 (1.384)	-0.067 (-1.595)	0.010 (-0.584)
Size	25.1 (1.161)	0.001 (3.031)*	0.000 (3.418)*	-0.544 (3.021)*
AGE	-313.3 (-1.167)	0.005 (1.080)	-0.003 (-1.900)***	-0.030 (-0.694)
N	101	101	101	101
F-stat	2.491**			
R2	0.1			
LL		-55.47*	41.87*	-223.49*

*Note:* Figures in parentheses refer to t-statistics in model 1, and Z-statistics in models 2 and 3; \*, \*\* and \*\*\* refer to statistical significance at 1%, 5% and 10% respectively.

*Source:* Computed from ERIA Survey (2009-2010).

### ***Probit Results***

The three critical dependent variables, viz., VA/L, X/Y and TI were subjected to more rigorous tests against the independent variables on the basis of the production network intensity (PNI) variable. Probit regressions were run to examine the probability of strongly and weakly integrated firms in domestic production networks. The results passed the log likelihood (LL) test for model fit for interpretation. The results are presented in Table 11.

It can be seen in model 1 that the explanatory variable of labor productivity and the control variable of size were significant statistically. Labor productivity was positively correlated and significant at the 5% level of statistical significance. Size was inversely correlated and statistically highly significant at the 1% level. The results show that more integrated firms in domestic production networks are more productive than less integrated firms. The smaller the firm the more likely that it is strongly integrated in domestic production networks. The latter suggests that smaller firms in Malaysian manufacturing largely operate as suppliers.

Export-intensity and size were inversely correlated and statistically significant in the model 2. The inverse correlation between X/Y and Size, and domestic PNI is to be expected. The higher the exports, the less will the firms sell domestically to other industries. The same logic accounts for the strong inverse correlation between size and PNI as noted above, i.e. smaller firms are likely to outsource and sell to other industries than larger firms.

The explanatory variable of technological intensity showed no statistically significant relationship with PNI in model 3 demonstrating that PNI did not matter in technological intensities. Indeed, separate regressions also showed no statistical relationship between training intensity and R&D intensity, and PNI. This result may also reflect the exposure of SMEs to international competition. For the same reasons explained earlier, size was again statistically inversely correlated with PNI in model 3.

The results in this sub-section show that production network intensities (PNI) matter in labor productivity, export-intensities and size but not on technological intensities. The negative coefficient of size in models 1, 2 and 3 shows that smaller Malaysian SMEs are more integrated into domestic production networks than larger SMEs. The extent of integration in domestic production networks does not appear to

matter with technological levels. Overall, the results are interesting as apart from technology, integration in production networks does seem to relate positively with the critical economic performance variables of labor productivity and export intensity.

**Table 11. Probit Estimations of Production Network Intensity against Critical Variables, Sampled Firms, Malaysia, 2008**

Variable	(1)	(2)	(3)
C	0.165 (0.547)	1.011(3.020)*	0.539 (1.523)
VA/L	0.000 (2.316)**		
X/Y		-2.005(-4.010)*	
TI			-0.465 (-0.533)
Own	0.174 (0.477)	0.439(1.152)	0.178 (0.489)
Size	-0.005 (-3.600)*	-0.002 (-1.683)***	-0.004 (-2.774)*
A	0.014 (0.877)	0.013 (0.779)	0.005 (0.322)
N	101	101	101
PNI=1	52	52	52
PNI=0	49	49	49
LR Stat	19.40*	32.07*	13.61*

Note: \*, \*\* and \*\*\* refer to correlations significant at 1%, 5% and 10% respectively.

Source: Computed from ERIA Survey, 2009-2010.



## 7. Conclusions

This paper sought to assess the impact of production networks on productivity, exports and technological upgrading in SMEs in electric-electronics, textiles-garments, automotives and wood products in Malaysia. In light of the extensive emphasis the Malaysian government has been providing, the evaluation is useful for future policy lessons. SMEs have also responded by demonstrating increasing participation in the manufacturing sector over the period 1996-2008.

The differences in means of the two groups of a number of variables of firms drawn by domestic production network intensities using two-tailed 'Z' tests mattered strongly in the intra-industry and the types of purchasers domestically and exports. Whereas more integrated firms were showing higher production linkages domestically, less integrated firms showed higher export intensities. Among the technological variables that were significant, less integrated firms showed higher intensities than more integrated firms. More integrated firms reported higher incidence of barriers and potential solutions than less integrated firms among the statistically significant differences in the means.

The econometric results show that TI is important in both productivity and export-orientation. Size is important in the export-intensity, TI and TE regressions. The positive correlations between size, and productivity and export intensity, and the lack of it with TI, shows that bigger size among scale matters in driving economic performance but not in technological intensities. The Probit estimations show that production network intensities matter in labor productivity, export-intensities and size but not on technological intensities. The negative coefficient of size in all the models shows that smaller SMEs are more integrated in domestic production networks than larger SMEs in Malaysian manufacturing. The extent of integration in domestic production networks does not matter with technological levels but matters positively with the critical economic performance variables of labour productivity and export intensity.

While SMEs have increasingly become important in the manufacturing sector in Malaysia since 1996 the analysis also offers room for policy to further strengthen their

synergies. Barriers other than those typically noted were the most significant obstacles faced by SMEs in Malaysia and they were less serious among firms more integrated in domestic production networks suggesting that networking synergies may have helped lessen their intensities. There is also room for policy as counseling and advice were a significant influence on overcoming barriers. Although more integrated SMEs appear to face more serious financial problems than less integrated firms it is largely because of the latter being smaller than the former. The policy solution for Malaysian SMEs here then should be targeted at examining in greater detail the sources of finance accessed by the smaller SMEs.

Given the positive results of domestic production networks, the Malaysian government should include the *ex ante* vetting, monitoring and *ex post* appraisal of SME conduct and performance using the domestic production network framework to better support them. In doing so it is also important to give greater weight to the specificity of each of the industries as the nature of influence exerted by production networks will be different in each of them.

It will also help governments in Southeast Asia to carefully examine the nexus between suppliers, buyers and economic performance so as to stimulate inter-firm production synergies to capture greater performance by the firms. Connecting in value chains is the starting point. Efforts must then be taken to stimulate their movement atop the value chain. It will also be useful to examine production networks further by extending the linkages to the whole of Southeast Asia. In automotives and electronics, in particular, significant production networking that was originally initiated by Japanese firms has synergized production and trade integrating Southeast Asia more deeply compared the other region in the world (see Rasiah and Amin, 2010).

## References

- Acs, Z. and Audrestch, D. (1988) "Innovation in Large and Small Firms: An Empirical Analysis." *American Economic Review* 78, no.4: 678–690.
- Audretsch, D. (2003) "Standing on the Shoulders of Midgets: The US Small Business Innovation Research Program (SBIR)," *Small Business Economics* 20, no.2: 129–135.
- Audretsch, D. (2002) "The Dynamic Role of Small Firms: Evidence from U.S." *Small Business Economics* 18, (1-3): 13-40.
- Brusco, S. (1982) "The Emilian Model: Productive Decentralization and Social Integration." *Cambridge Journal of Economics* 6, no.2: 167-184.
- Chee, P.L. (1986) *Small Industry in Malaysia*, Kuala Lumpur: Berita Publishing.
- Coase, R. (1937) "The Nature of the Firm." *Economica* 4, no.16: 386-405.
- ERIA-Malaysia (2009-10) "Field Survey Conducted to Gather Data", Kuala Lumpur.
- Fukunari, K. (2002) "Subcontracting and the Performance of Small and Medium Firms in Japan." *Small Business Economics* 18, (1-3):163-75.
- Fukunari, K. (2006) "International Production and Distribution Networks in East Asia: Eighteen Facts, Mechanics, and Policy Implications." *Asian Economic Policy Review* 1: 326-344.
- Gereffi G. (2002) "International Competitiveness in the Global Apparel Commodity Chain." *International Journal of Business and Society* 3, no.1: 27-60.
- Gereffi, G., Humphrey, J. and Sturgeon, T. (2005) "The Governance of Global Value Chains." *Review of International Political Economy* 12, no.1: 78-104.
- International Institute for Labour Studies, pp 1-24.
- Jomo, K.S. (1986) *A Question of Class*, Singapore: Oxford University Press.
- Krueger, A. (1995) "East Asian Experience and Endogenous Growth Theory." Smith, H. (ed), *The Economic Development of Northeast Asia*, Canberra: Australian National University Press.
- Lall, S. (1992) "Technological Capabilities and Industrialisation", *World Development* 20, no.2:165-86.
- Lall, S. (2001) *Competitiveness, Technology and Skills*, Cheltenham, Edward Elgar.
- Marshall A. (1890) *Principles of Economics*, London: Macmillan.
- Matthews, J.A. (2006) "Electronics in Taiwan – A Case in Technological Learning." Chandra, V. (ed), *Technology, Adaptation and Exports: How Some Developing Countries Got It Right*", pp 83-126.
- McNally.
- Nelson, R. (2008) "Economic Development from the Perspective of Evolutionary Theory." *Oxford Development Studies* 36, no.1:9-21.

- North, D. (1990) *Institutions, Institutional Change, and Economic Performance*, New York: Cambridge University Press.
- Piore, M. and Sabel, C. (1984) *The Second Industrial Divide: Possibilities for Prosperity*, New York: Basic Books.
- Pratten, C. (1971) *Economies of Scale in Manufacturing Industry*, Cambridge, Cambridge University Press.
- Rasiah, R. (1988a) "The Semiconductor Industry in Penang: Implications for the New International Division of Labour Theories." *Journal of Contemporary Asia* 18, no.1: 24-46.
- Rasiah, R. (1988b) "Production in Transition within the Semiconductor Industry and its Impact on Penang." *Kajian Malaysia* 6, no.1.
- Rasiah, R. (1994) "Flexible Production Systems and Local Machine Tool Subcontracting: Electronics Component Transnationals in Malaysia." *Cambridge Journal of Economics* 18, no.3: 279-298.
- Rasiah, R. (1995) *Foreign Capital and Industrialization in Malaysia*, Basingstoke: Macmillan.
- Rasiah, R. (2009) "Growth and Slowdown in the Electronics Industry in Southeast Asia." *Journal of Asia Pacific Economy* 14, no.2: 123-137.
- Rasiah, R. and Gachino, G. (2005) "Are Foreign Firms More Productive and Technology Intensive than Local Firms in Kenyan Manufacturing?" *Oxford Development Studies* 33, no.2: 211-227.
- Scherer, F. (1980) *Industrial Market Structure and Economic Performance*. Chicago: Rand
- Sengenberger, W. and Pyke, F. (1992) "Industrial Districts and Local Economic Regeneration: Research and Policy Issues." in F. Pyke and W. Sengenberger (eds), *Industrial Districts and Local Economic Regeneration*, Geneva,
- Wilkinson, F. and You, J.I. (1994) "Competition and Cooperation: Towards Understanding Industrial Districts." *Review of Political Economy* 6:259-278.
- Williamson, O. (1985) *The Economic Institutions of Capitalism*, New York: Free Press.
- Yoshihara, K. (1988) *The Rise of Ersatz Capitalism in Southeast Asia*, Singapore: Oxford University Press.

**Appendix. Correlation Coefficient Matrix, Sampled Firms, Malaysia, 2008**

	<b>VA/L</b>	<b>OWN</b>	<b>AGE</b>	<b>Size</b>	<b>X/Y</b>	<b>TI</b>	<b>TE</b>	<b>RD</b>
<b>VA/L</b>	1.000	0.103	-0.095	0.146	-0.016	0.256	0.122	-0.032
<b>OWN</b>	0.103	1.000	0.216	0.471*	0.318	0.033	0.012	-0.075
<b>AGE</b>	-0.095	0.216	1.000	0.365	0.241	-0.034	0.028	-0.007
<b>Size</b>	0.146	0.471*	0.365	1.000	0.511	0.362	0.218	0.045
<b>X/Y</b>	-0.016	0.318	0.241	0.511	1.000	0.289	-0.051	-0.112
<b>TI</b>	0.256	0.033	-0.034	0.362	0.289	1.000	0.477*	0.322
<b>TE</b>	0.122	0.012	0.028	0.218	-0.051	0.477*	1.000	0.835*
<b>RD</b>	-0.032	-0.075	-0.007	0.045	-0.112	0.322	0.835*	1.000

*Note:* \* - high correlation.

*Source:* Computed from ERIA Malaysia survey (2009-10).

## **1. Introduction**

For a wide range of reasons governments have promoted the development of small and medium enterprises (SMEs). Whereas industrial district exponents have viewed the role of governments as an important component - within a blend of markets and trust - (Brusco, 1982), neoclassical economists have argued that SMEs not only are the best allocators of resources but their development should be led by markets (Krueger, 1995). The new institutionalists hold markets as the superior institution. However, they argue that because of market failures arising from frequency, asset specificity and uncertainty, they consider that other modes of coordination such as command and trust are important to resolve the gaps left behind by markets (see Coase, 1937; Williamson, 1985; North, 1990). Evolutionary economists consider all institutions as equally important and the significance of size is considered to be influenced by the specificities of the industries involved, including the nature of technical change, sources of access to knowledge and actors involved. The latter is uneven, non-linear and often changes with circumstances and location (see Nelson, 2008).

Using evolutionary economic theory, this paper seeks to examine the impact of production networks on technology, and economic performance of SMEs in the Malaysian manufacturing industries of electric-electronics, textile-garments, automotives and wood products. Value chains play a specific role in particular sets of industries, as internalized multinational production networks, through outsourcing arrangements or through a combination of the three. Existing works on production networks have only documented the significance, new developments or transition in control over value chains (see Gereffi, 2002; Gereffi, Humphrey and Sturgeon, 2005). Hence, the key question the paper seeks to answer is whether the intensity of integration in production networks matters in both the technological intensity and economic performance levels of SMEs in Malaysian manufacturing.

This paper examines the impact of production networks in driving productivity, exports and technological upgrading in SMEs in electric-electronics,

textiles-garments, automotives and wood products industries in Malaysia. The rest of the paper is organized as follows. Section 2 discusses government policy targeted at supporting the development of SMEs. Section 3 presents the critical theoretical arguments on SMEs. Section 4 discusses the methodology and data used in the paper. Section 5 examines the descriptive statistics. Section 6 analyzes the impact of production networks controlling for other variables. Section 7 presents the conclusions.

## 2. Government Policy

SMEs have figured significantly in the industrialization initiatives in Malaysia. The earliest can be traced to colonial Malaya, where, since the 1950s, the British provided small loans through the Rural Industrial Development Authority (RIDA) in order to stimulate petty handicraft manufacturing (Jomo, 1986; Rasiah, 1995). The purpose of this initiative was to arrest support for the communist insurgency and hence the program did not achieve much success. The Malaysian government opened the Majlis Amanah Rakyat (MARA) as one of the strategies in the late 1960s to uplift the livelihood of *Bumiputeras*,<sup>2</sup> which *inter alia*, supported the development of Malay entrepreneurship. Such forays by the government were carried out through privately incorporated channels. It was only since 1975 through the Industrial Coordination Act (ICA) that the initiatives of the Malaysian government to implement the New Economic Policy (NEP) of 1971 that formal efforts to restructure the economy ethnically using regulatory measures were implemented. Formal SME programs have since mushroomed in several ministries before efforts were taken to integrate them under one body in 1996. These programs have had a bearing on the growth and performance of SMEs in Malaysian industrialization.

---

<sup>2</sup> *Bumiputera* literally translated means son or prince of the soil. The term was originally used to refer to Malays, but it has subsequently been extended to include the indigenous peoples of Malaysia, Malaysian Thais and the Eurasians and straits Chinese (Baba Chinese) with lineage to pre-colonial Malaya.

The ICA of 1975, inter alia, regulated ownership of industrial firms with paid up capital exceeding MYR250,000, and employment size exceeding 50 employees so that at least 30 percent Bumiputera equity is met. These floor stipulations were raised to MYR500,000 and 75 employees by 1980, and subsequently to MYR1 million and 100 employees before it was raised again to MYR2.5 million by the end of the 1980s (Chee, 1986). The floor stipulation of MYR2.5 million has remained since. Meanwhile foreign firms exporting over 80 percent of output were allowed to keep 100 percent of foreign ownership. As Malaysia has a small domestic market, foreign firms in manufacturing largely exported and hence did not find the ICA regulations stifling (see Rasiah, 1995). However, the expansion of non-*Bumiputera* local firms was considered to have been hampered by such regulations (see Jesudasan, 1987), many of which apparently had to hand out free gifts to find and attract *Bumiputera* partners (see Yoshihara, 1988).

The Government took on direct initiatives during the Dr Mahathir premiership throughout the period of 1981-2003 when government funds and strategies targeted the growth of industrial SMEs. The umbrella concept was introduced to nurture particularly *Bumiputera* SMEs with Proton (backward linkages) and Perwaja Steel (forward linkages) becoming key targets. Firms offering tenders to supply components and parts to Proton and to use wire rods from Perwaja Steel were required to show at least 51 percent *Bumiputera* ownership. Given that these firms supplied largely to the domestic market, they came under the customs regulations of the principal customs area and hence the ICA regulations involving industrial firms selling less than 80 percent of their output in Malaysia.

Following criticism of the first Industrial Master Plan (IMP) of 1986 and the Second Industrial Master Plan (IMP2) of 1996 over the growth of multinationals in key export-oriented industries such as electric-electronics and textile and garments as being truncated with little linkages in the domestic economy, the government introduced the Subcontract Exchange Scheme to stimulate linkages. Electronics multinationals in particular took on the project seriously to not only access incentives, but also to see it as an integral part of their policy to cheapen costs and make manufacturing flexible. Arguably, using detailed studies of production transitions and the evolution of regional and proximate production networks, Rasiah (1988a, 1988b) had argued that the time



then was ripe for host-governments to take advantage of these developments to promote the growth of local supplier firms. The key argument is that the multinationals were then seeking to develop suppliers to support their own self-expansion plans. In Penang in particular, suppliers to electronics multinationals expanded several times between 1980 until 1993 (see Rasiah, 1994, 1996). However, only Penang demonstrated a successful expansion of suppliers in the industries of machine tools, plastic molding and packaging, largely benefiting from a surge in proximate demand from electronics multinationals implementing flexible production techniques.

Meanwhile, government promotion of SMEs expanded into other manufacturing industries, including food processing and wood products (Malaysia, 1996). SME products were included in Malaysia's exhibitions and promotions abroad through MATRADE's activities. Whereas the depletion of timber, and cane and bamboo has led to a relative contraction of the latter, the promotion of food processing has expanded considerably with palm oil and oleo-chemical products becoming important (Jaya Gopal, 2001; Rasiah, 2006).

The uneven growth of suppliers only in industries complementary to electronics, and only in Penang, led the government to review its SME policies. After much deliberation on the IMP2 the government introduced the Small and Medium Industries Development Corporation (SMIDEC) in 1996. It was felt that the corporatist outlook as well as the integration of all SME activities under one body within the Ministry of International Trade and Industry (MITI) will help rationalize and synergize SME promotions. Because of the problems of funding faced by new start ups and small SMEs, the SME Bank was introduced in 2006 to provide special interest based loans to qualifying SMEs. SMIDEC was subsequently transformed into an SME Corporation in 2009.

The new initiatives were helpful in that they helped provide both advisory as well as more effective support for SMEs as connections and coordination between entrepreneurs were linked much better with the *meso* organizations the government launched to stimulate the growth of SMEs. However, the mid-1990s proved a turning point as the growth of suppliers in Penang plateaued and subsequently began to contract. The lack of human capital and government indecision over leveraging strategies recommended by the IMP2 caused a hollowing out effect in the electronics

industry in Malaysia. Denied the capacity to upgrade into higher value added activities, several foreign firms either relocated operations to cheaper cost sites endowed with larger labor reserves such as China and Vietnam or scaled down their operations in Malaysia. The remaining flagship multinationals began to either use largely foreign labor in low-end assembly activities (e.g. Flextronics and Western Digital) or upgraded into designactivities (e.g. Intel and Motorola) or fabrication activities (e.g. OSRAM). Unfortunately the lack of human capital has restricted the latter to a handful of firms (see Rasiah, 2010).

Nevertheless, proactive support from the government has helped support the growth of SMEs in Malaysia. The share of SMEs has risen considerably over the 1996-2008 period. The government's policy to promote SMEs as well as the slowdown in the foreign MNC-led sector were instrumental in the relative expansion of the SME share in overall manufacturing value output, value added and employment (see Table 1). The contribution of SMEs in manufacturing output, value added and employment in Malaysia rose from 22.1, 19.5 and 29.6 percent respectively in 1996 to 29.6, 25.9 and 31.1 percent respectively in 2005 and 30.9, 26.5 and 31.8 percent respectively in 2008. Both output and value added of manufacturing SMEs grew faster on average in 2005-2008 than over the period 1996-2005. Only the number of establishments grew more slowly in the latter period.

**Table 1. Contribution of SMEs in Manufacturing, Malaysia, 1996-2005**

Indicators	1996	2005	2008
Total Output			
Value (RM billion)	51.5	81.9	100.3
% Share of the manufacturing sector	22.1	29.6	30.9
Average Annual Growth		5.3*	6.3#
Added Value			
Value (RM billion)	10.1	16.6	20.5
% Share of the manufacturing sector	19.5	25.9	26.5
Average Annual Growth		5.7*	6.5#
Number	329,848	394,670	420,917
% Share of the manufacturing sector	29.6	31.1	31.8
Average Annual growth		2.0*	1.8#

*Note:* \* - Average annual growth rate for 1996-2005; # - Average annual growth rate over 2005-2008; Growth rates computed using 2000 prices. Source: [http://www.smidec.gov.my/pdf/SME\\_Performance\\_Report\\_2005.pdf](http://www.smidec.gov.my/pdf/SME_Performance_Report_2005.pdf); <http://www.smeCorp.gov.my/sites/default/files/SME%20AR08%20Eng%20Text.pdf>

Hence, it can be seen that both government promotion as well as the contribution of SMEs in Malaysian manufacturing have been important since the 1970s, particularly during Mahathir's premiership between 1981 until 2003. In light of this development it will be interesting to examine the dynamics of SMEs growth and expansion in Malaysian manufacturing. Due to the significance of both export-oriented as well as import-substitution manufacturing in the country, and on the basis of the special programs introduced to target growth, the industries of electric-electronics, textiles-garments, and automotives and wood products are chosen for analysis in the paper.

### 3. Theoretical Guide

Industrial organization economists argue that minimum scale efficiencies vary with industries as the long run average cost curves of firms are determined by the scale involved (Pratten, 1971; Scherer, 1980). Firms are expected to expand production so long as marginal revenue is equal to or greater than marginal cost. Hence, there is a tendency for industrial organization economists to support large size, especially when it involves heavy industries such as automobiles and steel. However, industrial district (see Wilkinson and You, 1994; Marshall, 1890; Piore and Sabel, 1984; Rasiah, 1994;

Sengenberger and Pyke, 1992) exponents argue that SMEs are better allocators and coordinators of resources and production owing to the latter's size flexibility and agility to enter and exit markets.

Unlike the impersonal large firm, SMEs are considered to provide greater room for horizontal relationships that support trust and social capital. Audretsch (2002, 2003) and Acs & Audretsch (1988) produced evidence from the USA to argue that SMEs participate more in R&D activities than large firms. Unlike the dynamic methodology used to capture relationships by industrial district exponents, Audretsch (2002) and Acs & Audresch (1988) used statistical evidence to argue over the allocative and flexibility advantages of small firms. Given the strength of the arguments above, it is worth exploring this debate using empirical evidence from a region endowed with strong basic infrastructure but poor high tech institutions without specifying one size to be superior to the other. The assessment will also allow comparisons with Rasiah & Asokkumar's (2007) findings in Malaysia as a whole where larger firms reported higher human resource and process technology intensities.

Within the SME literature production networks have become increasingly important as intra-industry linkages with considerable decomposition of value chains and significant parts of these segments have been outsourced. Production networks have particularly been important in East Asia with Taiwan, China, Singapore, Malaysia, Thailand, Indonesia, Philippines, Vietnam and Cambodia figuring strongly in global value chains (Gereffi, 2002). However, active domestic intra-industry linkages have largely been important with strong horizontal participation in high value added activities by local firms in Japan, Taiwan, Korea, Singapore, Hong Kong and China among the East Asian nations (see Rasiah, 2003). Fukunari (2002, 2006) had documented the growth and influence of production networks on economic performance in Japan and East Asia. Indeed, in particular industries connecting in global value chains appear to be the initial route to technological catch up (see Mathews, 2006). Hence, the focus of this paper is on production networks intensity, and its influence on economic performance and technological intensities.

## 4. Methodology

This section introduces the methodology used for examining the impact of production networks on technology and economic performance while controlling for firm-specific variables. Given the usual sequence of examining differences and relationships statistically, the paper will first examine descriptive statistics followed by two tail tests comparing the means of critical technology and economic performance variables differentiated by the degree of integration in production networks. The subsequent analysis will focus on statistical determinants of the key technology and performance variables controlling for size, ownership and age.

As identified in the theoretical guide, productivity and export-intensities are important economic performance variables, while technological intensity is a key explanatory variable. Hence, these three variables are the critical dependent variables that will be examined in the paper. The variables of ownership, size and age will be used as control variables. In addition, technological intensity will be used as the key explanatory variable in the economic performance regressions. The variables on technology have been estimated using embodied logic in the manner initiated by Lall (1992, 2001) but without a focus on investment capabilities.

The key differentiating variable used is the production network intensity (PNI) dummy. PNI is defined by the share of inputs in overall inputs drawn from domestic suppliers and the share of outputs sold to buyer firms for further processing and assembly. Sales to wholesalers (and retailers) and exports, and imports were excluded from the numerator of the PNI variable.

Because of the use of 500 as the dividing employment figure of SMEs in some countries, e.g. the United States and Japan, the selection of SMEs in the sample takes account of this figure rather than the Malaysian cut-off size of 150 employees. Nevertheless, interpretations are made of the impact of production networks by size categories, which will help capture both effects and its consequent implications for policy in Malaysia.

## **Specification of Variables**

The variables used in the paper are specified in this sub-section. The firm-level variables defined refer to labour productivity, export intensity and technological intensity. Size is also an important explanatory variable. The control variables of size, ownership and age are also defined here.

### **Labor Productivity**

Labor productivity is used as one of the key economic performance variables. As the questionnaire used in the survey did not draw out investment or capital data, no attempt is made to estimate total factor productivity. Besides, we believe the controversy of the efficacy of TFP as a technology variable is real. Hence, we do not regard its avoidance to raise questions on the strength of the arguments. It was measured as:

$$\text{Labor productivity} = \text{VA}/\text{L}$$

Where VA and L refer to value added and workforce respectively. VA is estimated in US dollars.

### **Export Intensities**

Firm level performance is estimated using export-intensity (X/Y), which is measured as follows.

$$\text{Export Intensity} = X_i/Y_i$$

X and Y refer to exports and total gross output respectively of firm *i* in year 2004. Taking into account the fact that India is among the top five exporters of garments in the world, we expect export intensity levels to be encouraging. Both local and foreign owned large firms in the sample recorded higher export levels than SMEs (see Table 2)

### **Technological Capabilities**

Drawing on Rasiah (2009), technological intensity (TI) was measured by incorporating the three proxies of Human Resource (HR), Process and Product

Technology (PPT) and R&D (RD) intensities. The three indexes helped the estimation of firm-level embodied technology.

### **Human Capital**

Human capital (HC) were measured as follows:

$$HC = \text{Professionals and technical personnel in workforce}$$

### **Training Expenditure**

Training expenditure (TE) is measured as follows:

$$TE = \text{training expenditure/sales}$$

### **Process Technology**

Process technology (PT) intensity refers to process technology competency of firms, and is expected to have a positive relationship with export intensity. PT is measured as follows:

$$PT = \text{Cutting edge inventory, process and quality control techniques of firm } i,$$

PT is estimated by adding the following cutting edge process techniques: materials requirement planning (MRP), materials resource planning (MRP1), integrated materials resource planning, statistical process control (SPC), quality control circles (QCC), total preventive maintenance, small group activities, ISO9000, ISO 14000, just-in-time (JIT) and quality standard (QS).

### **Research and Development**

Higher levels of R&D (RD) intensity are expected to be correlated with higher levels of economic performance. Hence, we estimate RD as follows:

$$RD = RDEX_i$$

Where RDEX refers to proportion of R&D expenditure to sales.

## **Technological Intensity**

TI, is estimated by using the formula:

$$TI_i = HR_i + TE_i + PT_i + RD_i$$

Given no *a priori* arguments on the greater significance of any one of the three technological capabilities, and since their significance is likely to vary with the location of firms in the overall technological trajectories (see Rasiah, 2004), no attempt is made to weight them. The variables on the right hand side of the formula were added through the following formula:

$$\text{Normalization Score} = (X_i - X_{\min}) / (X_{\max} - X_{\min})$$

Where  $X_i$ ,  $X_{\min}$  and  $X_{\max}$  refer to the  $i$ th, minimum and maximum values of proxy X respectively.

## **Control Variables**

Four control variables were used in the econometric regressions, *viz.*, production network intensity, size, ownership and age. Throughout the regressions, production network intensity is the key differentiating variable

## **Production Network Intensity**

Intra-industry purchases and intra-industry sales as a share of overall sales and purchases were used as the basis for differentiating firms in two groups, one with high production network intensity (PNI) and the other with low PNI.

$$PNI = \frac{[\text{Domestic intra-industry sales} + \text{domestic intra-industry purchases}]}{[\text{Sales} + \text{Purchases}]}$$

Separate regressions were run for high and low PNI using the following classification:

PNI=1 when the PNI score exceeds the median figure; otherwise PNI=0.



## **Size**

Throughout the thesis, size is the key differentiating variable and is represented by the fulltime workforce number of the firm. Because the simple use of actual employees did not produce a significant result, a dummy variable was used to classify size as small and medium enterprises (SME), and large enterprises, and was measured as:

$$\text{SME} = 1 - 200 \text{ employees} = 0;$$

$$\text{Large firms} = 201 \text{ and above employees} = 1$$

## **Age**

Age is simply measured here as follows:

$$A_i = \text{Number of years since establishment}$$

Age is expected to be positively correlated to export performance and technological capabilities as it is believed that firms over time gather the required knowledge and technological knowhow to perform better than the new start ups.

However, there are also arguments that new firms will find it more convenient to begin their production with the already existing superior technology, or that foreign firms which located recently will bring with them superior technology and will have better access to foreign markets (Rasiah, 2004). In view of the conflicting findings in the past, a neutral hypothesis is assumed at this stage.

## **Foreign Ownership**

There are only five joint venture firms in the sample and all five firms had a minimum equity of 10 percent of overall equity. The 10 percent equity level is acceptable as foreign equity in Indian firms is generally low. Furthermore, it is believed that even small amounts of foreign equity have some influence over the conduct of firms. Foreign ownership is measured as follows:

$$\text{Own}_i = 1 \text{ for firms with a minimum foreign equity of 50 percent and above}$$

$$\text{Own}_i = 0, \text{ if otherwise}$$

Due to the greater reach of foreign firms in global markets (Hirschman, 1970; Dunning, 1974), foreign ownership is expected to be positively correlated with export-intensities. The World Investment Report 2005 (UNCTAD 2005) had reported that R&D by foreign firms is highly concentrated in home countries. Lall (1992) showed evidence that firms tend to develop only process R&D in the host country. In another study, Rasiah & Gachino (2005) showed a positive relationship between foreign firms and technological intensities in Kenyan manufacturing firms. Thus, we can expect both a positive and negative relationships between foreign ownership and technological intensities.

### ***Data***

Data was collected over the period November 2009 until February 2010. Using a sampling frame drawn from the Department of Statistics (DOS), the breakdown of industry was drawn on the basis of manufacturing value added, size and ownership. The sample is dominated by electric-electronics firms, which contributed over 26 percent manufacturing value added in Malaysia in 2008. This was followed by automotives, textiles and garments and finally wood products (see Table 2). A correlation test was done between the variables and the results, and is presented in the Appendix.

**Table 2. Breakdown of Firms by Industry, Sample, Malaysia, 2008**

Industry	Firms
Automotives	24
Textile and Garments	10
Electric-Electronics	63
Wood Products	6
Total	103

*Source:* ERIA-Malaysia Survey (2009-10).

### ***Specification of Econometric Models***

The final evaluation carried out uses econometric models to examine differences in economic performance and technology variables controlling for industry-based, size-based, ownership-based and age-based influences. The following basic equations were estimated:

$$\text{OLS: } VA/L = TI+X/Y+ PNI+ Own+Size+Age \quad (1)$$

Where VA, L, TI, X, Y, PNI, Own, Size and A refer to value added, workforce, technological intensity, production network intensity, ownership, size and age respectively of firm i.

$$\text{Tobit: } X/Y \text{ TI} = PID+Own+Size+Age \quad (2)$$

Where VA, L, TI, X, Y, PNI, Own, Size and Age refer to value added, workforce, technological intensity, production network intensity, ownership, size and age respectively of firm i.

$$\text{Tobit: } \text{TI} = X/Y + PNI + Own + Size + Age \quad (3)$$

A second set of regressions were run using the probit model to predict if production network intensities mattered in economic performance and technological intensities. The following probit models were estimated:

$$\text{Probit: } PNI=1, PNI=0; = VA/L + Own+Size+Age \quad (4)$$

Where VA, L, TI, X, Y, PNI, O, S and A refer to value added, workforce, technological intensity, production network intensity, ownership, size and age respectively of firm i.

$$\text{Probit: } PNI=1, PNI=0; = X/Y + Own + Size + Age \quad (5)$$

Where VA, L, TI, X, Y, PNI, Own, Size and Age refer to value added, workforce, technological intensity, production network intensity, ownership, size and age respectively of firm i.

$$\text{Probit: } PI=1, PNI=0; \text{ TI} + Own + Size + Age \quad (6)$$

## 5. Descriptive Statistics

The results of the univariate tests of means, medians, standard errors, standard deviation and the number of observations are presented in Tables 2 and 3. Also examined are two-tail 'Z' statistics comparing the means between firms in group one

with PNI scores of the median and below, and group two with PNI scores of above the median. The variances between the two PNI groups were different and hence the comparison relied on unequal variances statistics. Except for nominal sales growth figures, the responses for the rest of the variables are either complete or almost complete. The final sub-section examines barriers and potential solutions to them by the two PNI groups.

### **Univariate Analysis**

The basic indicators shown in Table 3 were statistically significant using the one-tail test. Although the range between means and medians in some cases were wide, all the means are statistically significant at the 1 percent level of significance. This data is largely targeted at ensuring the validity of statistics used in the paper.

The mean and medians of the control variables of age were 16.9 and 17.0 years respectively, which is almost the same. The foreign equity mean ownership figure estimated using percentages rather than actual totals was 21.8 percent (see Table 3). The median was 0 percent demonstrating domination by local capital among SMEs in Malaysian manufacturing. The mean employment figure was 143 employees with the median being 91 employees. The largest employer had 500 employees while the smallest had 3 employees.

On average the sampled SMEs recorded sales of US\$14.7 million in 2008. The median sales figure was US\$3.4 million. The maximum and minimum sales figures recorded were US\$488. Million and US\$10,000 respectively. The mean and median value added recorded in 2008 were US\$2.7 million and US\$0.6 million respectively in 2008. The maximum and minimum value added recorded were 146,000 and 3,000 respectively. The mean and median share of value added in output 24.1 and 20.6 percent respectively.

Among the small number of firms reporting interest rates on loans, the mean and medians were 4.6 and 5.0 percent respectively in 2008. The highest loan reported was 10 percent and the lowest was 0 percent enjoyed by firms with support from government. By and large, these interest rates are low when compared to global rates.

The mean and median imports in purchases were 36.0 and 33.0 percent respectively in 2008. These figures tend to be much lower than large export-oriented firms (see

Rasiah, 2009). The mean and median export intensities of SMEs were higher at 49.0 and 58.2 percent respectively. To some extent higher export-intensities seem to support backward linkages in Malaysia.

The share of technical and professional staff in the workforce was fairly high in the SMEs as the mean and median figures were 46.7 and 54.0 percent respectively (See Table 4). The breakdown of mean percentage share of finance from own equity (including retained earnings) and banks was 27.5 and 25.0 percent respectively in 2008. The remainder was either from suppliers or buyers or other financiers. The commensurate median shares were 15.0 and 12.0 percent respectively. The smaller firms tend to figure less in the formal systems and equity among the SMEs.

Some technology scores were very impressive while others fell short. The mean incidence of use of the standards of ISO9000 (manufacturing practices) and ISO14000 (environmental practices) were 0.8 and 0.3 respectively. The commensurate medians were 1.0 and 0.0 respectively. With the maximum and minimum scores of 1 and 0, the incidence of ISO9000 was high while that of ISO14000 was low. In terms of cutting edge inventory and quality control systems, the mean scores were 1.6 and 2.0 respectively out of a maximum and minimum score of 5 and 4 respectively. The mean training and R&D expenditure in sales was 1.6 and 1.2 percent respectively. The commensurate medians were 0.6 and 0.4 respectively. The latter figures were low. The overall technology intensity (TI) index was low with a mean of 0.26 and a median of 0.24. Several SMEs, especially the micro firms, neither invested on training nor on R&D.

**Table 3. Basic Statistics, Malaysia, 2008**

	Age	FO	Sales (US\$)	Growth (2007-08)	VA (%)	VA (\$US)	VA(\$US)/L	Interest	Employees	Import*	Export#
Mean	16.9	21.78	14,653,858	8.8	24.1	2,709,045	15,735	4.6	143.0	36.0	49.0
Median	17.0	0	3,402,154	7.7	20.6	626,752	8,368	5.0	91.0	33.0	58.2
Std Dev	8.9	41.48	50,905,427	13.9	15.5	7,962,768	22,578	3.4	140.9	31.0	34.8
Std Error	0.9	4.13	5,015,861	1.5	1.5	784,595	2,225	1.1	13.9	3.1	3.4
Minimum	0	0	10000	-35.7	4.7	3,000	142	0	3	0	0
Maximum	41	100.00	488,567,707	72.6	86.0	63,513,802	146,345	10	500	100	100
N	103	101.00	103	88	103	103	103	10	103	101	103

*Note:* VA – value added; L – workforce; N – number of observations; Share of imports in inputs (%); # Share of exports in output (%). Source: Compiled from ERIA (2009).

**Table 4. Finance and Technology Statistics, Malaysia, 2008**

	HC	Finance		Standards		Systems		In Sales		TI
	Index	Equity*	Banks	ISO9000	ISO14000	Inventory	Quality	TE	RD	
Mean	46.7	27.5	25.0	0.8	0.3	1.6	2.0	1.6	1.2	0.26
Median	54.0	15.0	12.0	1.0	0.0	2.0	2.0	0.6	0.4	0.24
Std Dev	35.1	33.3	32.1	0.4	0.5	1.2	1.7	3.0	3.1	0.17
Std Error	3.5	3.3	3.2	0.0	0.0	0.1	0.2	0.3	0.3	0.02
Minimum	0	0	0	0	0	0	0	0	0	0
Maximum	100	100	100	1	1	5	5	20	25	0.63
N	103	103	103	103	103	103	103	103	103	101

*Note:* HC – human capital refers to share of professionals and technical personnel in workforce; Includes retained earnings; OEM – original equipment manufacturing; ODM – original design manufacturing; OBM – original brand manufacturing; TE – training expenditure; RD – R&D expenditure in sales.

*Source:* Compiled from ERIA (2009).

### **Comparison by Production Network Intensities**

We use the 2-tail Z-tests to examine differences in firm-level characteristics between more integrated and less integrated in domestic production networks. The median of the PNI variable was used to separate the two groups of firms. Some of the characteristics were statistically significant for interpretation.

As shown in Table 5 industry size category and employment numbers were statistically highly significant at the 1% level. Age, industry, ownership, sales, value added, labour productivity and type of funding were statistically insignificant. The more integrated firms with higher PNI scores show lower employment levels than the less integrated firms.

The structure of integration of firms in domestic production networks is shown in Table 6. Except for distance from export processing zones (EPZs), all the results were statistically highly significant (at 1% level). The mean percentage of purchases from local SMEs, local large firms and other domestic suppliers was much higher among the more integrated firms (21.9%, 47.5% and 83.0%) than in the less integrated firms (4.9%, 19.1% and 44.9%). The more integrated firms imported less (17.4%) than the less integrated firms (55.0%).

As is to be expected, the more integrated firms (68.6%) sold more in the domestic market than the less integrated firms (33.1%) (See Table 6). Intra-industry sales were also higher in the more integrated firms (52.6%) than in the less integrated firms (23.9%). The higher amounts of sales in the domestic market meant that the more integrated firms (31.4%) exported less than the less integrated firms (66.9%). Distance from EPZs did not matter at all in the levels of integration in domestic production networks.

**Table 5. Integration in Domestic Production Networks and Basic Characteristics Malaysian Sample, 2008**

	<b>PNI=0</b>	<b>PNI=1</b>	<b>Z-stats</b>	<b>p-value</b>
<b>Age</b>	17.57	16.19	-0.7774	0.4369
<b>Industry</b>	2.43	2.71	1.4958	0.1347
<b>Size</b>	3.94	2.88	-4.5557*	0.0000
<b>Own</b>	0.27	0.17	-1.1130	0.2657
<b>Sales (US\$)</b>	13,939,351	15,354,624	0.1415	0.8875
<b>Value Added (US\$)</b>	2,894,515	2,527,143	-0.2336	0.8153
<b>Value Added/Employment (US\$)</b>	12144.09	19256.76	1.6175	0.1058
<b>Employment</b>	193.37	93.56	-3.8165*	0.0001
<b>Equity and Retained Earning</b>	24.84	30.06	0.7927	0.4279
<b>Banks</b>	24.16	25.88	0.2700	0.7872
<b>Other financiers</b>	4.18	3.12	-0.4194	0.6749
<b>Others</b>	45.65	40.18	-0.6536	0.5134

*Note:* \* refers to statistical significance at the 1% level.

*Source:* Computed from ERIA Survey (2009-2010).



**Table 6. Integration in Domestic Production Networks, and Sales and Purchase Structure, Malaysian Sample, 2008**

	<b>PNI=0</b>	<b>PNI=1</b>	<b>Z-stats</b>	<b>p-value</b>
Local SMEs	4.90	21.92	2.773*	0.006
Local Large Firm	19.09	47.45	5.017*	0.000
Other Domestic Suppliers	44.93	83.01	7.843*	0.000
Imports	54.97	17.38	-7.615*	0.000
Domestic Sales	33.09	68.60	5.991*	0.000
Intra-Industry Sales	23.88	52.63	5.202*	0.000
Exports	66.91	31.40	-5.991*	0.000
Distance from EPZs	3.82	4.94	0.571	0.568

*Note:* \* refers to statistical significance at the 1% level.

*Source:* Computed from ERIA Survey (2009-2010).

Most technological variables did not show statistically significant differences against levels of integration in domestic production networks (see Table 7). Nevertheless, the overall technological intensity (TI) – which took account of the critical variables of inventory and quality systems, skills intensity, training expenditure in sales and R&D expenditure in sales – was statistically significant at the 5% level. Less integrated firms showed higher TI than more integrated firms, though the difference was small.

Less integrated firms showed higher incidence of participation in cutting edge inventory and quality control systems than the more integrated firms. The incidence of application of ISO9000 series and Materials Requirement Planning (MRPI) in less integrated firms was higher than in more integrated firms (see Table 7). Less integrated firms (22.7% and 24.7%) also showed higher intensity of vocational qualifications in workforce and marketing expenditure in sales than more integrated firms (15.9% and 16.0%).

**Table 7. Integration in Domestic Production Networks and Technological Intensities, Malaysian Sample, 2008**

	<b>PNI=0</b>	<b>PNI=1</b>	<b>Z-stats</b>	<b>p-value</b>
Technical and Professional Staff in Workforce	51.27	42.32	-1.302	0.193
Tertiary Qualifications	28.56	28.09	-0.091	0.927
Vocational Qualifications	22.70	15.91	-1.950**	0.051
High School Education	48.57	52.69	0.585	0.559
ISO9000	0.92	0.69	-3.058*	0.002
ISO14000	0.27	0.33	0.575	0.565
JIT	0.51	0.38	-1.275	0.202
QS	0.12	0.17	0.793	0.428
MRP	0.06	0.08	0.362	0.717
MRP1	0.73	0.54	-1.987**	0.047
MRPII	0.25	0.13	-1.542	0.123
Cellular Manufacturing	0.18	0.16	-0.187	0.852
Inventory Control Systems	1.80	1.46	-1.441	0.150
Quality Control Systems	2.27	1.73	-1.647***	0.100
Original Equipment Manufacturing	1.24	1.14	-1.269	0.204
Original Design Manufacturing	1.49	1.55	0.590	0.555
Original Brand Manufacturing	1.90	1.88	-0.283	0.778
Research and Development in Sales	1.58	0.79	-1.268	0.205
Training Expenditure in Sales	1.93	1.24	-1.196	0.232
Marketing Expenditure in Sales	24.72	16.02	-2.383**	0.017
Technological Intensity	0.30	0.26	1.960**	0.038

*Note:* \*, \*\* and \*\*\* refers to statistical significance at the 1%, 5% and 10% level.

*Source:* Computed from ERIA Survey (2009-2010).

## Barriers and Potential Solutions

The firms in the sample were asked to identify the barriers that they consider to have inhibited further improvements in their performance, as well as, what they thought as strategies that could help them overcome them. Likert scale scores ranging from 1 to 8 were given starting with 1 as the highest and 8 as the lowest. The means are presented in Tables 8 and 9.

Differences in the means on information, distribution, logistics and promotion, tax, tariff and non-tariff barriers were statistically significant, while the others were not. Among the significant results other barriers was the most significant at 1% followed by distribution, logistics and promotion barriers at 5% and information barriers at 10% (see Table 8). The less integrated firms with PNI=0 showed higher importance with lower means than the more integrated firms. The big gap in means between less and more integrated firms in the others category suggests that the former are facing more serious barriers than more integrated firms.

**Table 8. Integration in Domestic Production Networks and Barriers Faced, Malaysian Sample, 2008**

	PNI=0	PNI=1	Z-stats	p-value
Information Barriers	4.25	4.72	1.646***	0.100
Functional Barriers	4.29	4.70	1.474	0.141
Product and Price Barriers	4.06	3.98	-0.281	0.779
Distribution, Logistics and Promotion Barriers	3.92	4.58	2.367**	0.018
Procedural Barriers	3.90	4.03	0.413	0.679
Business Environment Barriers	4.19	4.23	0.109	0.914
Tax, Tariff and Non-tariff Barriers	4.75	5.35	2.103**	0.036
Other Barriers	4.64	6.23	5.045*	0.000

Looking at the reverse by examining potential solutions that can overcome barriers, counseling and advice, finance and others were statistically significant (see Table 9). The lower means of counseling and advice and others for less integrated firms compared to the more integrated firms show that they are more important among the former than the latter. Interestingly, finance as a solution was rated more highly by the more integrated firms. Because smaller firms are more immersed in domestic intra-industry production networks it may also be a problem of being small.

**Table 9. Integration in Domestic Production Networks and Potential Solutions to Barriers, Malaysian Sample, 2008**

	<b>PNI=0</b>	<b>PNI=1</b>	<b>Z-stats</b>	<b>p-value</b>
Training in General Management	4.50	4.22	-0.923	0.356
Counseling and Advice	4.64	5.50	3.020*	0.003
Technology Development	5.36	5.02	-1.089	0.276
Information on Markets	5.09	5.33	0.760	0.447
Business Linkages and Networks	4.58	4.05	-1.304	0.192
Finance	4.75	4.05	-1.970**	0.049
Overall Investment Climate	4.66	4.77	0.344	0.731
Others	5.39	6.35	2.861*	0.004

Overall, the univariate and two-tail ‘Z’ tests produced some interesting results. However, the differences in means of the two groups of a number of variables of firms drawn by domestic production network intensity were not significant. PNI did not matter in sales, value added and labour productivity as the differences were not statistically significant. It mattered strongly in the intra-industry and the types of purchasers domestically and exports. Whereas more integrated firms were showing higher production linkages domestically, less integrated firms showed higher export intensities. Among the technological variables that were significant, less integrated firms showed higher intensities than more integrated firms. More integrated firms reported higher incidence of barriers and potential solutions than less integrated firms among the statistically significant differences in the means.

## **6. Statistical Analysis**

The previous section examined the basic characteristics and statistical significance of differences in means between groups of firms divided by levels of integration in domestic production networks. This section is devoted to testing statistical relationships to examine the relationship between the dependent and independent variables in the first sub-section, and the significance of PNI on the critical explanatory variables in the second sub-section.

### ***OLS and Tobit Results***

The first set of analysis established statistical relationships using OLS and Tobit regressions. The results were significant for interpretation (see Table 10). The F-stats for the OLS regression on VA/L, and the log-likelihood test for the Tobit regressions of X/Y, TI and TE were statistically significant. All results are controlled for industry dummies.

TI was the only independent variable statistically significant in the VA/L regression (see Table 10) demonstrating the importance of technology on productivity. Interestingly the results also show that export-intensity, size, ownership and age did not matter on productivity.

TI and Size were statistically significant in the export-intensity regression. The positive correlation between TI and X/Y shows that technological intensity levels matter in export markets. The statistically highly significant and positive coefficient of size shows that larger size matters among SMEs in export markets. Ownership and age did not seem to matter in export markets.

The key findings in this section are that TI is important in both productivity and export-orientation. Size is important in the export-intensity, TI and TE regressions. The positive correlations involving size shows that bigger size among SMEs matters when it comes to exporting and showing higher intensities of training and overall technology.

**Table 10. Multiple Regressions on Economic Performance and Technology, Sampled Firms, Malaysia, 2008**

	OLS	Tobit		
	VA/L	X/Y	TI	TE
C	12368.6 (2.016)**	0.019 (0.171)	0.223 (6.263)*	0.241 (0.278)
X/Y	-10404.9 (-1.409)		0.083 (1.642)***	0.026 (0.022)
TI	34941.0 (2.371)**	0.537 (2.116)**		
OWN	5488.9 (0.896)	0.143 (1.384)	-0.067 (-1.595)	0.010 (-0.584)
Size	25.1 (1.161)	0.001 (3.031)*	0.000 (3.418)*	-0.544 (3.021)*
AGE	-313.3 (-1.167)	0.005 (1.080)	-0.003 (-1.900)***	-0.030 (-0.694)
N	101	101	101	101
F-stat	2.491**			
R2	0.1			
LL		-55.47*	41.87*	-223.49*

*Note:* Figures in parentheses refer to t-statistics in model 1, and Z-statistics in models 2 and 3; \*, \*\* and \*\*\* refer to statistical significance at 1%, 5% and 10% respectively.

*Source:* Computed from ERIA Survey (2009-2010).

### ***Probit Results***

The three critical dependent variables, viz., VA/L, X/Y and TI were subjected to more rigorous tests against the independent variables on the basis of the production network intensity (PNI) variable. Probit regressions were run to examine the probability of strongly and weakly integrated firms in domestic production networks. The results passed the log likelihood (LL) test for model fit for interpretation. The results are presented in Table 11.

It can be seen in model 1 that the explanatory variable of labor productivity and the control variable of size were significant statistically. Labor productivity was positively correlated and significant at the 5% level of statistical significance. Size was inversely correlated and statistically highly significant at the 1% level. The results show that more integrated firms in domestic production networks are more productive than less integrated firms. The smaller the firm the more likely that it is strongly integrated in domestic production networks. The latter suggests that smaller firms in Malaysian manufacturing largely operate as suppliers.

Export-intensity and size were inversely correlated and statistically significant in the model 2. The inverse correlation between X/Y and Size, and domestic PNI is to be expected. The higher the exports, the less will the firms sell domestically to other industries. The same logic accounts for the strong inverse correlation between size and PNI as noted above, i.e. smaller firms are likely to outsource and sell to other industries than larger firms.

The explanatory variable of technological intensity showed no statistically significant relationship with PNI in model 3 demonstrating that PNI did not matter in technological intensities. Indeed, separate regressions also showed no statistical relationship between training intensity and R&D intensity, and PNI. This result may also reflect the exposure of SMEs to international competition. For the same reasons explained earlier, size was again statistically inversely correlated with PNI in model 3.

The results in this sub-section show that production network intensities (PNI) matter in labor productivity, export-intensities and size but not on technological intensities. The negative coefficient of size in models 1, 2 and 3 shows that smaller Malaysian SMEs are more integrated into domestic production networks than larger SMEs. The extent of integration in domestic production networks does not appear to



matter with technological levels. Overall, the results are interesting as apart from technology, integration in production networks does seem to relate positively with the critical economic performance variables of labor productivity and export intensity.

**Table 11. Probit Estimations of Production Network Intensity against Critical Variables, Sampled Firms, Malaysia, 2008**

Variable	(1)	(2)	(3)
C	0.165 (0.547)	1.011(3.020)*	0.539 (1.523)
VA/L	0.000 (2.316)**		
X/Y		-2.005(-4.010)*	
TI			-0.465 (-0.533)
Own	0.174 (0.477)	0.439(1.152)	0.178 (0.489)
Size	-0.005 (-3.600)*	-0.002 (-1.683)***	-0.004 (-2.774)*
A	0.014 (0.877)	0.013 (0.779)	0.005 (0.322)
N	101	101	101
PNI=1	52	52	52
PNI=0	49	49	49
LR Stat	19.40*	32.07*	13.61*

Note: \*, \*\* and \*\*\* refer to correlations significant at 1%, 5% and 10% respectively.

Source: Computed from ERIA Survey, 2009-2010.

## 7. Conclusions

This paper sought to assess the impact of production networks on productivity, exports and technological upgrading in SMEs in electric-electronics, textiles-garments, automotives and wood products in Malaysia. In light of the extensive emphasis the Malaysian government has been providing, the evaluation is useful for future policy lessons. SMEs have also responded by demonstrating increasing participation in the manufacturing sector over the period 1996-2008.

The differences in means of the two groups of a number of variables of firms drawn by domestic production network intensities using two-tailed 'Z' tests mattered strongly in the intra-industry and the types of purchasers domestically and exports. Whereas more integrated firms were showing higher production linkages domestically, less integrated firms showed higher export intensities. Among the technological variables that were significant, less integrated firms showed higher intensities than more integrated firms. More integrated firms reported higher incidence of barriers and potential solutions than less integrated firms among the statistically significant differences in the means.

The econometric results show that TI is important in both productivity and export-orientation. Size is important in the export-intensity, TI and TE regressions. The positive correlations between size, and productivity and export intensity, and the lack of it with TI, shows that bigger size among scale matters in driving economic performance but not in technological intensities. The Probit estimations show that production network intensities matter in labor productivity, export-intensities and size but not on technological intensities. The negative coefficient of size in all the models shows that smaller SMEs are more integrated in domestic production networks than larger SMEs in Malaysian manufacturing. The extent of integration in domestic production networks does not matter with technological levels but matters positively with the critical economic performance variables of labour productivity and export intensity.

While SMEs have increasingly become important in the manufacturing sector in Malaysia since 1996 the analysis also offers room for policy to further strengthen their

synergies. Barriers other than those typically noted were the most significant obstacles faced by SMEs in Malaysia and they were less serious among firms more integrated in domestic production networks suggesting that networking synergies may have helped lessen their intensities. There is also room for policy as counseling and advice were a significant influence on overcoming barriers. Although more integrated SMEs appear to face more serious financial problems than less integrated firms it is largely because of the latter being smaller than the former. The policy solution for Malaysian SMEs here then should be targeted at examining in greater detail the sources of finance accessed by the smaller SMEs.

Given the positive results of domestic production networks, the Malaysian government should include the *ex ante* vetting, monitoring and *ex post* appraisal of SME conduct and performance using the domestic production network framework to better support them. In doing so it is also important to give greater weight to the specificity of each of the industries as the nature of influence exerted by production networks will be different in each of them.

It will also help governments in Southeast Asia to carefully examine the nexus between suppliers, buyers and economic performance so as to stimulate inter-firm production synergies to capture greater performance by the firms. Connecting in value chains is the starting point. Efforts must then be taken to stimulate their movement atop the value chain. It will also be useful to examine production networks further by extending the linkages to the whole of Southeast Asia. In automotives and electronics, in particular, significant production networking that was originally initiated by Japanese firms has synergized production and trade integrating Southeast Asia more deeply compared the other region in the world (see Rasiah and Amin, 2010).

## References

- Acs, Z. and Audrestch, D. (1988) "Innovation in Large and Small Firms: An Empirical Analysis." *American Economic Review* 78, no.4: 678–690.
- Audretsch, D. (2003) "Standing on the Shoulders of Midgets: The US Small Business Innovation Research Program (SBIR)," *Small Business Economics* 20, no.2: 129–135.
- Audretsch, D. (2002) "The Dynamic Role of Small Firms: Evidence from U.S." *Small Business Economics* 18, (1-3): 13-40.
- Brusco, S. (1982) "The Emilian Model: Productive Decentralization and Social Integration." *Cambridge Journal of Economics* 6, no.2: 167-184.
- Chee, P.L. (1986) *Small Industry in Malaysia*, Kuala Lumpur: Berita Publishing.
- Coase, R. (1937) "The Nature of the Firm." *Economica* 4, no.16: 386-405.
- ERIA-Malaysia (2009-10) "Field Survey Conducted to Gather Data", Kuala Lumpur.
- Fukunari, K. (2002) "Subcontracting and the Performance of Small and Medium Firms in Japan." *Small Business Economics* 18, (1-3):163-75.
- Fukunari, K. (2006) "International Production and Distribution Networks in East Asia: Eighteen Facts, Mechanics, and Policy Implications." *Asian Economic Policy Review* 1: 326-344.
- Gereffi G. (2002) "International Competitiveness in the Global Apparel Commodity Chain." *International Journal of Business and Society* 3, no.1: 27-60.
- Gereffi, G., Humphrey, J. and Sturgeon, T. (2005) "The Governance of Global Value Chains." *Review of International Political Economy* 12, no.1: 78-104.
- International Institute for Labour Studies, pp 1-24.
- Jomo, K.S. (1986) *A Question of Class*, Singapore: Oxford University Press.
- Krueger, A. (1995) "East Asian Experience and Endogenous Growth Theory." Smith, H. (ed), *The Economic Development of Northeast Asia*, Canberra: Australian National University Press.
- Lall, S. (1992) "Technological Capabilities and Industrialisation", *World Development* 20, no.2:165-86.
- Lall, S. (2001) *Competitiveness, Technology and Skills*, Cheltenham, Edward Elgar.
- Marshall A. (1890) *Principles of Economics*, London: Macmillan.
- Matthews, J.A. (2006) "Electronics in Taiwan – A Case in Technological Learning." Chandra, V. (ed), *Technology, Adaptation and Exports: How Some Developing Countries Got It Right*", pp 83-126.
- McNally.
- Nelson, R. (2008) "Economic Development from the Perspective of Evolutionary Theory." *Oxford Development Studies* 36, no.1:9-21.

- North, D. (1990) *Institutions, Institutional Change, and Economic Performance*, New York: Cambridge University Press.
- Piore, M. and Sabel, C. (1984) *The Second Industrial Divide: Possibilities for Prosperity*, New York: Basic Books.
- Pratten, C. (1971) *Economies of Scale in Manufacturing Industry*, Cambridge, Cambridge University Press.
- Rasiah, R. (1988a) "The Semiconductor Industry in Penang: Implications for the New International Division of Labour Theories." *Journal of Contemporary Asia* 18, no.1: 24-46.
- Rasiah, R. (1988b) "Production in Transition within the Semiconductor Industry and its Impact on Penang." *Kajian Malaysia* 6, no.1.
- Rasiah, R. (1994) "Flexible Production Systems and Local Machine Tool Subcontracting: Electronics Component Transnationals in Malaysia." *Cambridge Journal of Economics* 18, no.3: 279-298.
- Rasiah, R. (1995) *Foreign Capital and Industrialization in Malaysia*, Basingstoke: Macmillan.
- Rasiah, R. (2009) "Growth and Slowdown in the Electronics Industry in Southeast Asia." *Journal of Asia Pacific Economy* 14, no.2: 123-137.
- Rasiah, R. and Gachino, G. (2005) "Are Foreign Firms More Productive and Technology Intensive than Local Firms in Kenyan Manufacturing?" *Oxford Development Studies* 33, no.2: 211-227.
- Scherer, F. (1980) *Industrial Market Structure and Economic Performance*. Chicago: Rand
- Sengenberger, W. and Pyke, F. (1992) "Industrial Districts and Local Economic Regeneration: Research and Policy Issues." in F. Pyke and W. Sengenberger (eds), *Industrial Districts and Local Economic Regeneration*, Geneva,
- Wilkinson, F. and You, J.I. (1994) "Competition and Cooperation: Towards Understanding Industrial Districts." *Review of Political Economy* 6:259-278.
- Williamson, O. (1985) *The Economic Institutions of Capitalism*, New York: Free Press.
- Yoshihara, K. (1988) *The Rise of Ersatz Capitalism in Southeast Asia*, Singapore: Oxford University Press.

**Appendix. Correlation Coefficient Matrix, Sampled Firms, Malaysia, 2008**

	<b>VA/L</b>	<b>OWN</b>	<b>AGE</b>	<b>Size</b>	<b>X/Y</b>	<b>TI</b>	<b>TE</b>	<b>RD</b>
<b>VA/L</b>	1.000	0.103	-0.095	0.146	-0.016	0.256	0.122	-0.032
<b>OWN</b>	0.103	1.000	0.216	0.471*	0.318	0.033	0.012	-0.075
<b>AGE</b>	-0.095	0.216	1.000	0.365	0.241	-0.034	0.028	-0.007
<b>Size</b>	0.146	0.471*	0.365	1.000	0.511	0.362	0.218	0.045
<b>X/Y</b>	-0.016	0.318	0.241	0.511	1.000	0.289	-0.051	-0.112
<b>TI</b>	0.256	0.033	-0.034	0.362	0.289	1.000	0.477*	0.322
<b>TE</b>	0.122	0.012	0.028	0.218	-0.051	0.477*	1.000	0.835*
<b>RD</b>	-0.032	-0.075	-0.007	0.045	-0.112	0.322	0.835*	1.000

*Note:* \* - high correlation.

*Source:* Computed from ERIA Malaysia survey (2009-10).

## CHAPTER 10

# Small and Medium Enterprises in Regional Production Networks: An Indonesian Case

**T.M ZAKIR MACHMUD**

Associate Director for Economic and Policy Research,  
Institute for Economic & Social Research,  
Faculty of Economics University of Indonesia

**RIZKI N SIREGAR**

Researcher  
Institute for Economic & Social Research,  
Faculty of Economics University of Indonesia

*This study attempts to identify and examine key characteristics and constraints faced by Indonesian SMEs, in general and according to their status in production networks, as well as to draw some policy implications. The study utilizes a survey of selected manufacturing industries that was recently conducted in three provinces in Java. The key characteristics findings are as follows: Overall, the majority of SMEs surveyed are domestically owned, traditionally organized and still domestic-oriented. On average, they have been established for more than 15 years, employ up to 50 workers, of whom a large proportion are males with high school-level education or less, they still rely on their own money to finance their business, and they sell their product primarily to local final assemblers and wholesalers/retailers. The SMEs surveyed also mainly acquire raw materials from local suppliers. While the characteristics of out-of-production network SMEs have a lot in common with the overall sample, the characteristics of production network SMEs vary greatly. Although only a small number were included in the survey, production network SMEs are on average bigger in size, conduct their businesses using modern methods, and are more open internationally. The significant variation in characteristics between the two groups is also reflected in the groups' perceived barriers to SME growth and development, as well as in the effectiveness of assistance received. While out-of-production network SMEs are more concerned about internal barriers, those working within production networks focus more on external barriers. Taking into account these differences in characteristics and perceptions, separate policy measures should be addressed for each group.*



## 1. Introduction

Economic integration has been one of the significant implications of globalization. Parallel to this, globalization has also transformed the global production process, from a fully integrated one into a sequence of interconnected chains of processes. Two key features of this transformation are: (1) *outsourcing* – sub-contracting parts of the process to other (upstream or downstream) business entities; and (2) *off-shoring* – sub-contracting the process abroad as part of cost reduction program. These features have increased the opportunity for local enterprises, including Small and Medium Enterprises (SMEs), to be involved in global production networks.

Understanding how to establish connections between local SMEs and global production networks has attracted extensive attention of many stakeholders, including academics and policy makers. Over the past few decades, a large body of theoretical and empirical literature on global production networks and its influence on economic development have been developed, postulating many advantages of participating in networks. It is also clearly important for policy makers to understand this connection as it provides support for industrial and development policy formulation. However, studies focusing on SME participation in production networks are relatively limited.

To shed light on this issue, this study attempts to gain a better understanding of SMEs and their participation in production networks. First, the study examines the internal characteristics of SMEs in Indonesia, along with the perceived barriers they face, and assesses the government support they receive. Second, the study analyzes comparisons of these characteristics, barriers and assessments between SMEs that participate in production networks and non-participating SMEs. To achieve this goal, the study utilizes information from a recent survey conducted by Lembaga Penyelidikan Ekonomi dan Masyarakat Fakultas Ekonomi Universitas Indonesia (LPEM FEUI), which gathered firm-level information. Three pre-selected manufacturing industries are covered in the survey, they are clothing and garments, parts and components of automotives, and parts and components of electronics and machineries.

Overall, this study comprises six sections. After the introduction, section 2 highlights some main characteristics of SMEs, and their contribution to the Indonesian

economy. Section 3 reviews some literature on SMEs in Indonesia, as well as policy measures to promote SMEs that have been undertaken by the Government of Indonesia. A small survey of manufacturing SMEs in selected industries, and descriptions of respondents' profiles, are analyzed on section 4, followed by Section 5 that elaborates on the survey results with respect to status of SMEs' involvement in production networks. Some perceptions of barriers toward this end are also discussed in this section. Lastly, section 6 concludes the paper by providing a summary and some policy recommendations.

## **2. SMEs in the Indonesia Economy**

There were several definitions of small and medium enterprises (SMEs) which were commonly used in Indonesia prior to the enactment of Law no. 20 of 2008. While the Ministry of Cooperatives, Small and Medium Business Enterprises, defines an SME based merely on annual sales, the Central Statistics Agency uses number of employees as the main criterion to define an SME. The Central Bank employs different criteria to define SMEs, which include not only the value of assets and annual sales, but also the amount of loan funding they have received. Therefore it is not surprising to see that this leads to coordination policy problems among the agencies.

Despite that, Small and Medium Enterprises (SMEs) are strategically vital to the Indonesian economy. In 2006/2007 they accounted for more than 95% of total enterprises, and were also the largest employment generator (absorbing over 90% of the total workforce) in the country. Further, SMEs also contribute just over 50% of national output, both in current and constant prices. Typically, SMEs in Indonesia are concentrated in the agricultural sector, followed by trade, hotels and restaurants as the second, and manufacturing as the third largest sector, accounting for 52%, 28% and 6.5% respectively. Furthermore, within the manufacturing sector, SMEs are involved mainly in low technology manufacturing industries such as the food and beverage, textile and garment, and wood product industries, while only small numbers of them are involved in high technology industries.

Geographically, a large proportion of SMEs in Indonesia are scattered widely throughout rural areas. This is in line with the fact that a considerable number of SMEs are involved in the agricultural sector. Despite there being a slight upward trend in the volume of SME export, SME export is historically very small in amount, relative to that of large-scale enterprises. This may imply that the SME sector in Indonesia is predominantly domestic-oriented. Overall, they contribute only 15% to 16% of total national exports, most of which comes from medium enterprises. Another interesting feature of export-oriented SMEs in Indonesia is that the majority of them do not export directly, but rather indirectly through intermediaries like traders, trading houses, and exporting companies (Tambunan 2007).

### **3. Some Studies on Indonesia SMEs**

As is the case in many developing countries, the development of SMEs in Indonesia is still lagging behind, relative to those in developed countries. A number of studies have provided examination of the state of SMEs in Indonesia and relevant policies. These include Urata (2000), Turner (2003), World Bank (2005), Thee (2006), and Tambunan (2006, 2007). Relative to other studies, Urata (2000) provides a comprehensive look at SMEs in Indonesia. According to Urata (2000), problems faced by the SME sector can be classified into three aspects., namely: (i) the financial aspect (i.e. access to financial resources/markets), (ii) the non-financial aspect (i.e. human resources, technology, and information) and (iii) the administrative aspect (i.e. coordination, monitoring and assessment).

Despite their relative underdeveloped state, SMEs also have several positive features. SMEs can still contribute to the stabilization process in times of crises (Barry *et al* 1999) and can also be an essential development agent due to their ability to react fast to change and innovation (Urata 2000). These abilities allow them to create new markets and opportunities.

### **3.1. Studies on SMEs in Production Networks**

The above mentioned studies examine SMEs in a general fashion. To the best of our knowledge, only a few studies have investigated the participation of Indonesian SMEs in production networks. Among them are industry case studies conducted by Tambunan (2007) and Sandee *et al.* (2002). The main advantage of conducting industry case studies is that they provide more understanding of the drivers and mechanics of production networks. Tambunan conducted a study on SMEs in a metalworking industry cluster in Tegal, Central Java, whereas Sandee *et al.* studied metal casting SME clusters in Klaten, also in Central Java. Both studies have shown that SMEs located in industrial clusters show a greater likelihood of having business linkages with large enterprises and wholesale distributors through sub-contracting systems. Moreover, they revealed that SMEs located in industrial clusters were also more able to improve their technological and innovation capability.

### **3.2. Overview of SME Policies in Indonesia**

The Indonesian government has encouraged and promoted the importance of SMEs to the country's economic development. Until now, it has formulated and implemented various types of policy measures to further enhance the SME sector. To address financial problems, the government has launched various types of small-scale subsidized credit schemes including Kredit Investasi Kecil (KIK), Kredit Modal Kerja Permanen (KMKP), Kredit Usaha Kecil (KUK). With respect to non-financial problems, the government has initiated many kinds of technical assistance, covering aspects such as human resources, production, general management, quality control, technology, establishing small-scale industrial clusters/estates, small business coaching, small business incubator systems, foster parent programs, an SME innovation center and many more. To tackle administrative problems, the government has introduced several measures including simplifying rules and regulations for small business, enacting Presidential Decree no. 6 in 2007 on Policy to Accelerate Primary Sector and Empowerment of Micro, Small and Medium Scale Business, as well as unifying the definition of an SME (Law no.20/2008).

Although quite extensive policy measures have been undertaken, the results are still in question. A large part of this is due to coordination problems within government institutions.

## **4. Survey of Manufacturing SMEs in Indonesia**

### **4.1. Survey Design and Methodology**

First, the study employs a formal definition of SMEs, according to Law no.20/2008, that defines a small-scale enterprise as a business unit which has fixed assets (excluding land and buildings) of Rp 50 million to Rp 500 million, or annual sales of Rp 300 million to Rp 2.5 billion. Meanwhile, medium-scale enterprise is defined as a business unit which has fixed assets (excluding land and buildings) of Rp 500 million to Rp 10 billion, or annual sales of Rp 2.5 billion to Rp 50 billion.

As mentioned earlier, a survey of three pre-determined manufacturing industries was conducted. They were: clothing and garments (CG), parts and components of automotives (PCA), and parts and components of electronics and machineries (PCEM).<sup>1</sup> The survey was administered by LPEM FEUI from late October to December 2009, and utilized the latest Indonesian Economic Census 2006, published by the Central Statistics Agency (BPS) to construct sampling frames.

From the census, the three Indonesian provinces with the largest percentages of manufacturing SMEs are selected, consisting of West Java province (20%), Central Java province (17.7%) and East Java province (17.3%). Overall, these three provinces account for 55% of total manufacturing SMEs in Indonesia, which justifies the decision to select these provinces as the survey target locations. Further analysis of the census

---

<sup>1</sup> The Clothing and Garment industry comprises Indonesian Standards of Industrial Classifications (ISIC) code 17 and 18, the Parts and components of automotive industry consists of ISIC code 34 and 35, and the Parts and components of machinery and electronics industry contains ISIC code 29 – 32. Further detailed explanation of these selected industries can found in Appendix 1.

suggests that, rather than being evenly distributed throughout each province, SMEs tend to be concentrated in only a few districts or cities.

With a total of 105<sup>2</sup> randomly selected companies from the three manufacturing industries, the distribution of respondents is seen in table 1 below.

**Table 1. Distribution of Respondents**

Province	Districts	Industry			TOTAL
		CG	PCA	PCEM	
West Java	Bogor	2	4	5	47
	Bekasi	0	3	5	
	Bandung	8	2	0	
	Bandung City	8	3	7	
Central Java	Tegal	5	8	10	39
	Pekalongan	6	1	0	
	Pekalongan City	4	0	1	
	Semarang	0	1	3	
East Java	Sidoarjo	2	2	5	19
	Gresik	2	0	2	
	Surabaya City	3	3	0	
TOTAL		40	27	38	105

The survey used a similarly structured questionnaire to those applied in other member countries of the ERIA-SME working group. Since the information to be gathered is quite extensive, the target respondents are middle managers and above, or the owners of the companies.

#### **4.2. Overall SME Respondent Profile**

On average, our respondents have already been established for more than 15 years. The oldest was established in 1940 (in the Clothing Garment industry), while the youngest was established in 2004 (in the Clothing Garment and Parts and Components

<sup>2</sup> Initially, the survey was aiming for 125 manufacturing SME respondents. However, due to incomplete information it was trimmed down to 105 respondents.

of Electronics and Machinery Industries). Relative to the other industries, the PCEM industry is a recently developed one, as the oldest PCEM firm was established in 1972.

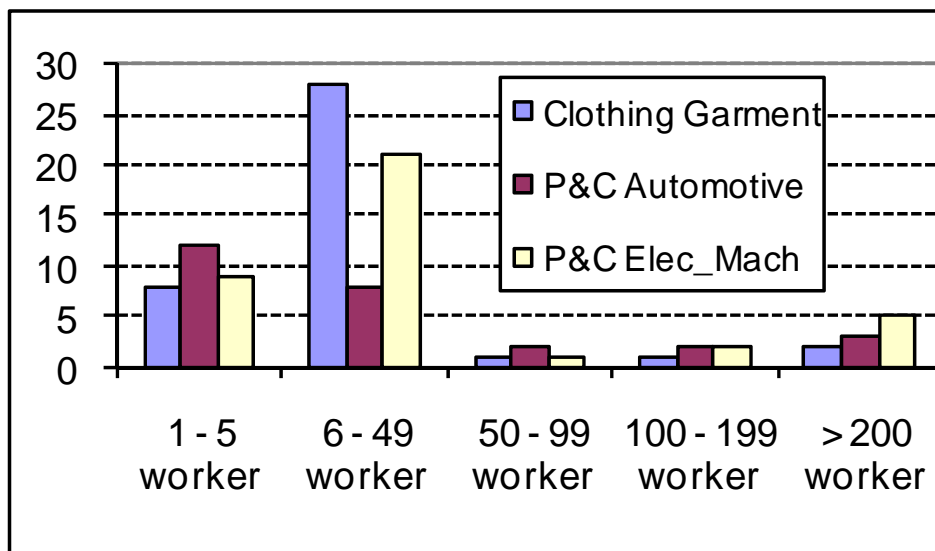
**Table 2. Age Profile of Sample**

<b>YEAR EST</b>	<b>CG</b>	<b>PCA</b>	<b>PCEM</b>
Year max	2004	2003	2004
Year avg	1992	1992	1991
Year min	1940	1945	1972

Source: author's calculation

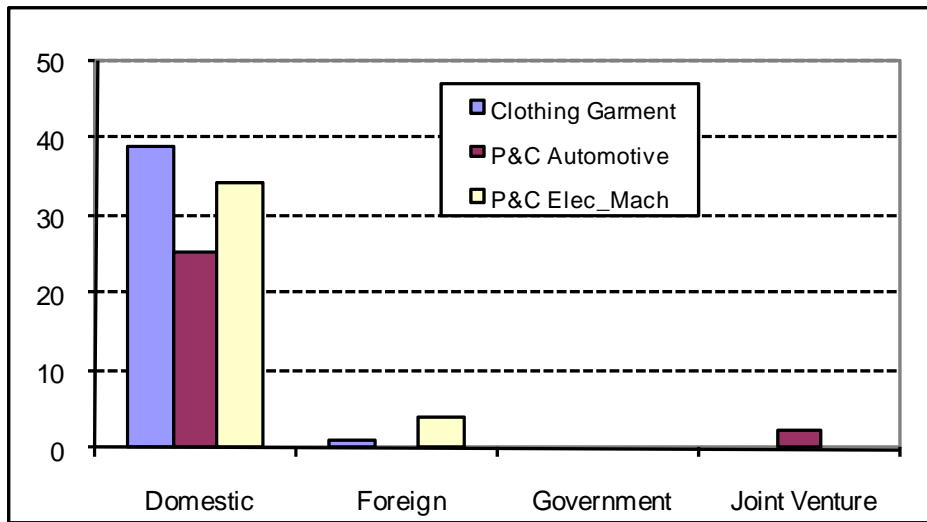
In terms of workforce size, the general pattern reveals that large fractions of our SME respondents (86 of 105) have less than 50 workers, with most (57 of 86) having from 6 to 49 workers. Only 10 of 105 firms have more than 200 workers. Conversely, a large proportion of SMEs in the PCA industry only have between 1 and 5 workers. Figure 1 below describes the workforce size by industry type.

**Figure 1. Distribution of Respondents according to Company Size**



Source: Author's calculation

**Figure 2. Distribution of Respondents according to Ownership**



In total, more than 90% of the SME respondents are domestically owned. Only a few SMEs are foreign owned, or are a joint venture with foreign firms. Such types of ownership status are common in the PCA and PCEM industries, and the people or foreign firms involved are mainly from Japan and Korea. The status of SMEs by industry type can be seen in Figure 2 above.

Material costs remain the largest part of total costs for the respondents, on average accounting for more than 50% of their cost structure. The second and third largest part of total costs are labor (greater than 20% on average) and utilities (above 10% on average) respectively. This pattern is similar across industries. Table 3 below reveals the average cost structure by industry type.



**Table 3. Cost Profile of Sample**

COST STR (AVG)	CG		PCA		PCEM	
	2007	2008	2007	2008	2007	2008
Profit (%)	14.9	14.8	18.2	16.3	18.4	17.9
Labour cost (%)	22.5	22.3	23.1	23.7	21.8	21.5
Material cost (%)	57.4	57.0	56.3	56.2	56.1	55.8
Utilities cost (%)	10.4	10.7	11.1	11.8	11.1	11.4
Interest pay't (%)	5.0	5.1	2.1	1.9	4.0	4.1
Other cost (%)	4.9	4.9	7.3	6.4	7.0	7.1

*Source:* Author's calculation

*Note:* Profit is percentage of sales

Cost variables are percentages of Total Cost

In 2008, the average number of employees per firm across all industries was about 57, and more than 90% of them are educated to high school graduate level or lower. This explains the low productivity of the labor force in SMEs. Another crucial point related to employment in SMEs is that most of the workforce is male, regardless of their level of education.

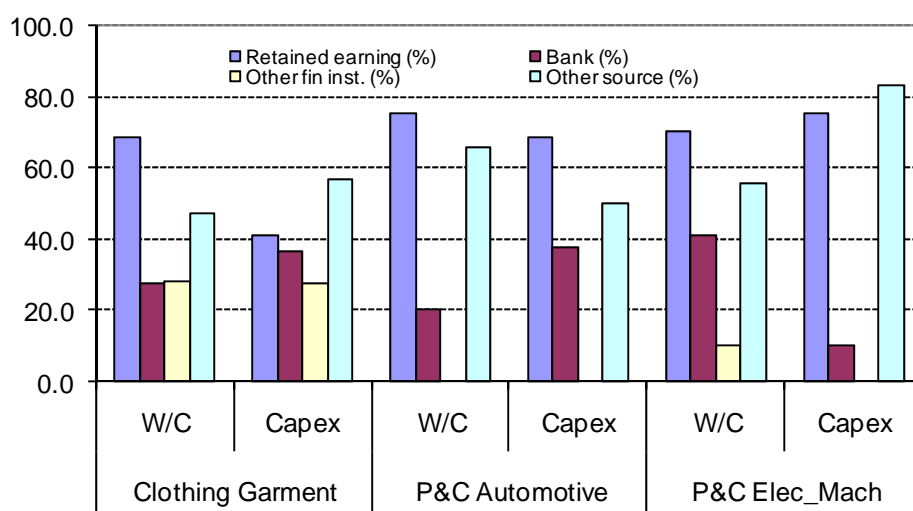
**Table 4. Employment Profile of Sample**

EMPL 2008 (AVG)	CG	PCA	PCEM	TOTAL
Number	25.3	81.8	73.3	57.2
% Female	36.0	5.7	13.8	20.2
% Tertiary	1.7	5.7	2.8	3.1
% Female	4.9	6.2	7.6	6.2
% Vocation	0.5	2.1	4.2	2.3
% Female	2.8	10.0	9.5	7.1
% High School/less	97.9	92.3	93.3	94.8
% Female	36.0	5.8	14.1	20.3

*Source:* Author's calculation

There is a slight variation in terms of SME sourcing of funds, Retained earnings is the primary source of funds for working capital (W/C) in all selected industries, with an average usage per firm of around 70%. In contrast, for capital expansion (Capex), SMEs in the CG and PCEM industries would prefer to use ‘others’ (i.e. personal savings) as the main source of funds to finance their expansion, while PCA firms still prefer to use retained earnings. The second source of funds is the bank, followed by other financial institutions. This may suggest that a large proportion of SMEs are still relying on their own money, and hence are not exposed to banks or other financial institutions yet. This may reflect a strong traditional mindset.

**Figure 3. Distribution of Respondents' Financial Source (%)**



Source: Author's calculation

From a total of 105 SMEs, only 12 import part or all of their raw materials from abroad, most of which comes from China and Japan. The Industry that uses a relatively large amount of imported raw materials is PCME. A large fraction of SMEs obtain their raw materials from domestic market. Table 5 shows that respondents obtain their input from various sources. In the domestic market, the main source is from local SMEs which, on average, fulfills 34% of their firms' input needs, followed consecutively by other domestic suppliers and large local firms with 31.2% and 28.9% respectively. There are some variations across industries in this regard. Firms in the clothing and

garment industry use other domestic suppliers and local SMEs as their main source of input. For firms in the automotive industry, the main source of input is from large local firms, while those in the electronics and machinery industry obtain their input materials largely from local SMEs.

On average, more than 90% of SMEs' products are sold to the domestic market. This supports the strong domestic orientation of Indonesian manufacturing SMEs. For those firms which sell domestically, on average each of those selling to final assemblers around 79%, selling to wholesalers/retailers around 65%, and the rest to the 3rd tier and higher (57.5%), to the 2nd tier (49%) and to the 1st tier (43.4%)<sup>3</sup>. Besides the domestic market, only 12 SMEs exported their products abroad with, on average, each of those firms exporting around 49% of their production. Of these 12 exporters, there are 7 exporting SMEs from the Clothing Garment industry, 4 from the Parts and Components of Electronics and Machinery industry, and only 1 from the Parts and Components of Automotive industry. Their main export destinations include ASEAN, Europe, USA, Australia, and Korea.

**Table 5. Respondents' Source of Input Material**

<b>Source of Material (AVG)</b>	<b>CG</b>	<b>PCA</b>	<b>PCEM</b>	<b>TOTAL</b>
Local SME (%)	36.8	29.3	34.3	34
Local Large Firms (%)	22.8	37.4	29.3	28.9
Other Domestic Supplier (%)	39.3	27	25.8	31.2
Import (%)	1.3	6.3	10.5	5.9
Total (%)	100	100	100	100
No. of importing firm	2	3	7	12
Avg.Import of Importing firms (%)	25.0	56.7	57.0	51.6
Source of import countries	Italy, China	China, Japan, Vietnam	China, Japan, Korea	

*Source:* Author's calculation

<sup>3</sup> Implementation of the survey suggests that respondents often did not have certain information about their relative position in the value chain networks. Therefore, we should be careful in interpreting the average percentages of their sales patterns.

**Table 6. Respondents' Sales Patern**

<b>Sales Patern (AVG)</b>	<b>CG</b>	<b>PCA</b>	<b>PCEM</b>	<b>TOTAL</b>
Domestic (%)	91.4	97.8	95.1	94.4
- Final Assembler (%)	85.6	74.7	76.7	79.0
- 1st tier (%)	49.2	28.8	46.1	43.4
- 2nd tier (%)	56.3	48.3	44.7	49.1
- 3rd tier and more (%)	-	68.3	38.8	57.5
- Wholesale/Retail (%)	72.2	61.0	59.3	64.9
Export (%)	49.4	60.0	46.3	49.3
No. of exporting firm	7	1	4	<b>12</b>
Target of export countries	ASEAN, USA, AUS	Europe	ASEAN,	
	Korea, Europe		Colombia	

*Source:* Author's calculation

In terms of location, an average SME respondent is about 35.5 km from a main port and 18.5 km from an EPZ or Industrial Park. There is, however, some variation across industries. The total number of SMEs inside versus outside EPZs or industrial parks is relatively similar, with 46 SMEs inside and 59 SMEs outside. Table 7 below presents the average distance of SMEs from main ports and EPZs or Industrial parks.

**Table 7. Respondents' Profile according to Location**

<b>Location (AVG)</b>	<b>CG</b>	<b>PCA</b>	<b>PCEM</b>	<b>TOTAL</b>
Dist from port (km)	43.4	26.2	33.9	35.5
Dist from EPZ/Ind Park (km)	21.0	16.4	17.3	18.5
No. Inside EPZ/Ind Park	17	12	17	46
No. Outside EPZ/Ind Park	23	15	21	59

*Source:* Author's calculation

## **5. Analysis of SMEs by Status in Production Network**

### **5.1. Comparison between SMEs In and Out of Production Networks**

There are various definitions of production networks being used in this study, however SMEs that participate in production networks are defined as either firms that sell their products to subsequent (downstream) business entities (i.e. 3rd tier, 2nd tier, 1st tier or final assemblers), excluding wholesalers/retailers, and export their production abroad, or firms that sell their products to subsequent (downstream) business entities (i.e. 3rd tier, 2nd tier, 1st tier or final assemblers), excluding wholesalers/retailers, and import their materials from abroad. This definition requires three strong assumptions. First, only direct export or import activity can be seen as participation in production networks. Second, it is implicitly assumed that foreign buyers are always downstream businesses that further process the products or, in a parallel way, foreign sellers are always upstream businesses that sell their products to be further processed. Third, wholesalers/retailers are presumed to be only involved in reselling products to end consumers, with no value added creation process.<sup>4</sup>

Taking the above definition, distribution of respondents by type of industry and their participation in production networks are presented in Table 8 below.

---

<sup>4</sup> This definition is not without limitation and may still be arguable. First, to a large extent, this is conflicting with the fact that the majority of export-oriented SMEs in Indonesia export their products indirectly, through intermediaries like traders, trading houses, and exporting companies, rather than exporting directly (Tambunan 2007). Second, there is no detailed information available from respondents regarding their foreign buyers or foreign sellers. Third, wholesalers/retailers could also perform other tasks rather than just reselling. For instance, a modern supermarket like Carrefour not only sells consumer goods to the final consumer, but also carries out other activities/functions such as producing ready-prepared food, repackaging and creating a home brand, all of which may create value added to the product sold. However, for simplicity it is still reasonable to use such a definition

**Table 8. Sample Profile based on Industries and Involvement in Production Network**

Prod. Network	Industry			Total
	CG	PCA	PCEM	
Non-PN	36 (90)	24 (89)	33 (87)	93 (89)
PN	4 (10)	3 (11)	5 (13)	12 (11)
<b>Total</b>	40 (100)	27 (100)	38 (100)	105 (100)

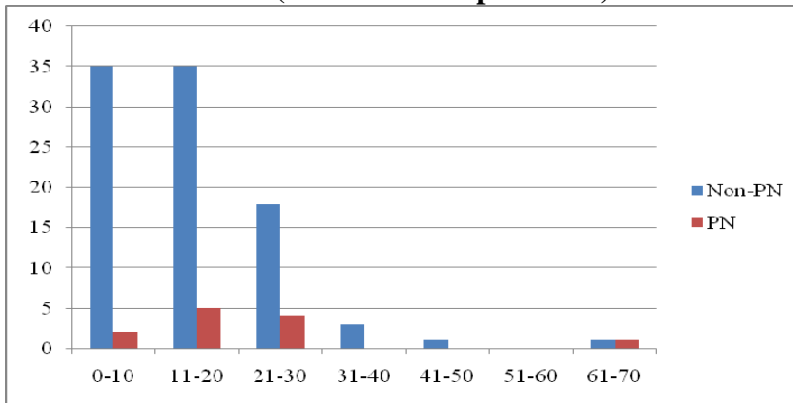
Source: Author's calculation

Figure in brackets are percentages

It is obvious that only a small number of respondents (slightly above 10%) participate in production networks. This pattern is similar across industries. Relative to other industries, the lowest percentage of participation in production networks is found in Clothing Garment industry. This seems reasonable as the type of products in this industry often do not require further processing and can be used directly by consumer. In contrast, products from Parts and Components of Automotive and Parts and Components of Electronics and Machinery industries require further processing before being sold to consumers.

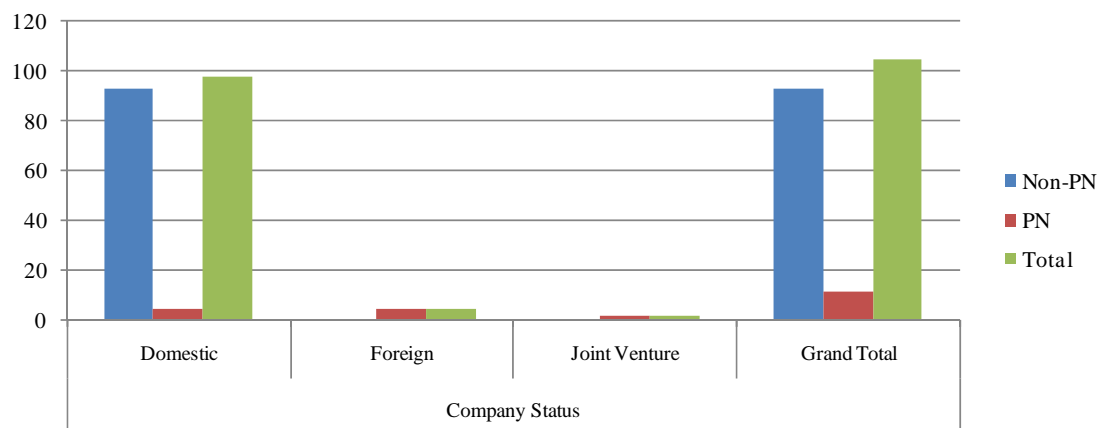
A comparison of the distribution of age groups between in-production network and out-of-production network respondents is presented at Figure 4 below. Overall, more than 90 percent of manufacturing SMEs in both groups are less than 30 years old. However, there is no clear pattern of variation evident among the groups, all of which suggests that the age variable has an insignificant effect on differences between the groups.

**Figure 4. Sample Profile based on Age Groups and Involvement in Production Network (number of respondents)**



In terms of ownership status, almost all respondents that work out of production networks are domestically owned, while only a few are either foreign owned or joint venture companies. In contrast, it is not surprising to find that more than half (58%) of SMEs in the production network group are either foreign-owned or joint venture companies, most of which are established in the PCA and PCEM industries. This may imply that the other 42% of SMEs in the production network group are domestically owned and are capable of participating in global production networks. Figure 5 below provides an illustration of the companies' ownership status.

**Figure 5. Sample Profile based on Ownership and Involvement in Production Network (number of respondents)**



In terms of workforce size, despite the majority still employing less than 50 workers, SMEs in production networks seem to have more variation in size, relative to out-of-production network SMEs. Quite a few SMEs in the production network group employ more than 100 workers, which puts them in the category of medium scale enterprise. Table 9 below presents the distribution of SME participation in production networks by employment size.

**Table 9. Sample Profile based on Company Size and Involvement in Production Network (number of respondents)**

Company Size	Production Network	
	Out	In
1-5 worker	29	0
6-49 worker	56	1
50-99 worker	3	2
100-199 worker	4	1
>200 worker	1	8
<b>Total</b>	93	12

Source: Author's calculation

For respondents from both the production network group and the out-of-production network group, cost of materials is still counted as the largest part of cost structure at, on average, more than 50% per firm, followed by labor costs (around 20%) and utilities costs (approximately 10%). Comparison of the groups reveals that firms in production networks spend, on average, a greater percentage on labor and material costs than those out of production networks.

**Table 10. Sample's Cost Structure based on Involvement in Production Network (percentage of total cost)**

Cost Structure (AVG)	Out		In	
	2007	2008	2007	2008
<b>Labor Cost</b>	22.1	21.9	24.9	25.8
<b>Material Cost</b>	56.3	56.2	59	58
<b>Utilities Cost</b>	11	11.4	9.8	9.8
<b>Interest Payment</b>	4	4	2.7	2.8
<b>Other Cost</b>	6.6	6.4	3.7	3.7

Source: Author's calculation

A quite similar pattern to the one mentioned above also appears with respect to average size of workforce per firm among the groups. SMEs that participate in production networks tend to employ a higher average number of workers, a higher percentage of female workers, and also a greater percentage of highly educated employees. Perhaps this might be one reason why SMEs in production networks have



a higher average percentage of labor costs , as previously described. These results also imply that the participation of SMEs in production networks is relatively good for gender equality, since SMEs participating in production networks employ far higher proportions of female workers at all educational levels.

**Table 11. Sample Profile based on Employment and Involvement in Production Network (number of workers and percentage)**

<b>Average Employment 2008</b>	<b>Out</b>	<b>In</b>	<b>Total</b>
Number	23.7	316.8	57.2
% female	18	37	20.2
% Tertiary	1.9	12.7	3.1
% female	4	23.4	6.2
% Vocational	1.6	7.5	2.3
% female	4.9	24.1	7.1
% High School/less	96.7	79.8	94.8
% female	17.7	40.6	20.3

*Source:* Author's calculation

Overall, SMEs that participate in production networks perform better in terms of average sales value than those that do not, although the discrepancy between the groups declined from 2007 to 2008. The relatively slow growth in average sales among SMEs in the production network group may reflect the impact of the global crisis in 2008 on overseas principal companies. A sharp decline in sales of principal companies abroad will in turn affect the demand for parts and components from off-shore networks. Table 12 below summarizes this situation.

**Table 12. Annual Sales Profile based on Industries and Involvement in Production Network**

Prod. Network	Average Sales 2007 (mill. Rp)				Average Sales 2008 (mill. Rp)			
	Industry			Group Average	Industry			Group Average
	CG	PCA	PCEM		CG	PCA	PCEM	
<b>Out</b>	1031	5443	2651	2745	40413	238606	106617	385635
<b>In</b>	1563	255333	87700	100896	6695	788000	488631	1283326
<b>Industry Average</b>	1084	33209	13841	13962	47108	1026606	595247	1668961

Source: Author's calculation

**Table 13. Margin of Profit Profile based on Industries and Involvement in Production Network**

Prod. Network	Average Profit 2007 (%)				Average Profit 2008 (%)			
	Industry			Group Average	Industry			Group Average
	CG	PCA	PCEM		CG	PCA	PCEM	
<b>Out</b>	15	14	17	14	19	18	17	16
<b>In</b>	11	19	28	32	16	17	18	22
<b>Industry Average</b>	15	15	18	16	18	18	17	16

Source: Author's calculation

Note \* : Percentage profit of total sales

Despite an increase in average sales value and sales growth, the average profit margin for firms within production networks declined sharply from 2007 to 2008. Once again, this emphasizes the sheer impact of the global crisis in 2008. Furthermore, declining profit margins are also caused by the increases in firms' average percentage of expenditure on labour costs, interest payments and other costs incurred by this group in the same period. Unlike those in production networks, out-of-production network SMEs perform better, in terms of their average profit margins. A brief description of the average profit situation can be seen in Table 13 above.

As can be seen in Table 14 below, both groups of respondents predominantly use their retained earnings as the primary source of finance for their working capital and capital expenditure. It can be seen from the table that retained earnings have the highest average percentage per firm in both groups. Surprisingly, the average percentage of working capital and capital expenditure sourced from retained earnings is higher in SMEs which are part of production networks, compared to the out-of-production network SMEs. On the other hand, the average percentage of finances sourced from banks and other financial institutions is much more prevalent in the SMEs which are part of production networks, implying that they have more variety of financing sources.

**Table 14. Sample Profile based on Financial Sources and Involvement in Production Network (percentage)**

<b>Source of Finance</b>	<b>Out</b>	<b>In</b>	<b>Total</b>
WC: Retained Earning	68.2	92.2	70.8
WC: Bank	27.8	55	30.4
WC: Other Fin. Institution	18.8	50	22.2
WC: Others	57	22.5	55.7
CE: Retained Earning	60	75	63
CE: Bank	38.6	62.5	43.9
CE: Other Fin. Institution	5	50	27.5
CE: Others	71.7	37.5	65.5

*Source:* Author's calculation

Direct comparison of SMEs that participate in production networks and those that are out of production networks highlights significant variation in terms of input structure. While those with no participation in networks heavily rely on local SMEs and other domestic suppliers, those in the networks depend on large local firms and import. This might also explain why SMEs in production networks have a higher average percentage of expenditure on materials than out-of-production network SMEs.

**Table 15. Sample Profile based on Source of Materials and Involvement in Production Network (percentage)**

<b>Source of Input</b>	<b>Out</b>	<b>In</b>	<b>Total</b>
Local SME	36.1	17.6	34
Local Large Firm	27.5	39.5	28.9
Other Dom. Supplier	34.1	9.3	31.2
Imports	2.3	33.7	5.9
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>

*Source:* Author's calculation

Figures for average distance from a main port provide unexpected findings (see table 16 below). Contrary to expectation, SMEs that are part of production networks have, on average, further away from main ports than those out of production networks. Logically, this distance from the port may result in higher cost of transportation to the port. However, it seems that distance to the main port has an insignificant impact on firms in production networks. Moreover, the discrepancy in average distance between those who are in and out of production networks is not too substantial, only slightly above 5 km.

**Table 16. Sample Profile based on Distance from Main Ports and Involvement in Production Network (km)**

<b>Prod. Network</b>	<b>Industry</b>			<b>Total</b>
	<b>CG</b>	<b>PCA</b>	<b>PCEM</b>	
<b>Out</b>	43.6	23.5	33.9	34.9
<b>In</b>	41.8	48.3	34	40.2
<b>Industry Average</b>	43.4	26.2	33.9	35.5

*Source:* Author's calculation

Information on distance from Export Processing Zones (EPZ) or Industrial Parks in Table 17 below highlights another interesting finding. First, the majority of SMEs are located outside the EPZs/Industrial Parks. The table shows that respondents with production networks are situated inside and outside the EPZs/industrial parks in equal

numbers. However, a close examination of the raw data for those located outside the EPZs suggests that the distance to EPZs is not too great, generally less than 10 km.

**Table 17. Sample Profile based on Location and Involvement in Production Network (number of respondents)**

Prod. Network	Industrial Park	
	Outside	Inside
<b>Out</b>	53	40
<b>In</b>	6	6
<b>TOTAL</b>	59	46

*Source:* Author's calculation

## 5.2. Perception of Barriers to SME Development

### 5.2.1. Perceptions of All Respondents

Table 18 below ranks the types of barriers perceived by respondent when running their businesses.<sup>5</sup> Overall, internal barriers (barriers associated with organization/resources/capabilities and approach to business development) are still regarded as the most significant barriers for SMEs to further develop their business. It can be clearly seen in the table that the top three barriers (those with the lowest average rank) are product and price barriers (2.8), functional barriers (2.9) and informational barriers (3.4), respectively.

Of the external barriers (barriers stemming from the home and foreign/target/host environment, within which the firm operates), the business environment barriers are the most significant (average rank of 4.1). The rest are regarded as having a less significant influence.

<sup>5</sup> On a scale of 1 to 8, the lower the rank, the more significant the barriers to their business.

**Table 18. Average Rank of General Barriers**

<b>Types of Barriers</b>	<b>Average Rank</b>
Product and price barriers	2.8
Functional barriers	2.9
Informational barriers	3.4
Business environment barriers	4.1
Procedural barriers	4.4
Distribution, logistics and promotional barriers	4.5
Tax, tariff and non-tariff barriers	6.1
Other barriers (e.g. perceived risk, benefit, willingness to adopt new idea)	7.7

*Source:* Author's calculation

A detailed portrait of these barriers is presented in tables 19 and 20. Table 19 presents the average rank of the top five strongest specific barriers to further developing the SMEs, while table 20 presents the five specific barriers perceived by respondents to be of least hinderence.

**Table 19. Five Strongest Specific Barriers**

<b>Code of Barrier</b>	<b>Barrier</b>	<b>Perception of Effectiveness (AVG)</b>
B28a	Poor/deteriorating economic condition in home market	2.43
B7	Shortage of working capital to finance new business plan	2.76
B2	Unreliable market data	2.78
B15	Difficulty in matching competitors' prices	2.85
B14	Offering competitive prices to customers	2.88

*Source:* Author's calculation

**Table 20. Five Least Hindering Specific Barriers**

<b>Code of Barrier</b>	<b>Barrier</b>	<b>Perception of Effectiveness (AVG)</b>
B29b	Inadequacy of basic and IT infrastructure in foreign market	4.43
B31b	High tax and tariff barriers in foreign market	4.56
B32b	Inadequate property protection in foreign market	4.58
B34b	High cost of custom administration in foreign market'	4.59
B33b	Restrictive health and safety standards in foreign market	4.65

*Source:* Author's calculation

In general, the majority of the most significant barriers faced by the sample are internal, i.e. parts of functional barriers, informational barriers and product and price barriers. On the other hand, all five of the least significant barriers are external, and are particularly related to foreign markets. This, in turn, strongly reflects the domestic-oriented characteristics of SMEs in Indonesia in general.

Of the seven forms of assistance that have been received, all of them are perceived to be effective or adequate. This is shown by their low average value of perception, which is around 2.<sup>6</sup> Among these forms assistance, counseling and advice is positioned on top, both in terms of frequency of being received (23) and in terms of the average value of its effectiveness (2.09). Interestingly, average values for training and financial assistance, even though both are the joint-second most frequently received (each get 22), are ranked number four (2.23) and six (2.5) respectively, in terms of their effectiveness. In contrast, business linkage & network and technology development, which have a relatively low rank in terms of frequency of provision (18 and 11 respectively), have higher average values for effectiveness (2.17 and 2.18 respectively)

---

<sup>6</sup> On a scale of 1 to 5, the lower the value, the more effective the assistance

than training and financing. Table 21 below displays the rankings for perceived effectiveness of assistance.

**Table 21. Summary of Assistance**

<b>Types of Assistance</b>	<b>Frequency</b>	<b>Aver. Value of Perception of Effectiveness</b>
Counseling and advice	23	2.09
Business linkage and network	18	2.17
Technology development	11	2.18
Training	22	2.23
Market information	16	2.25
Financing	22	2.5
Improvement in investment climate	16	2.5

*Source:* Author's calculation

It can be briefly inferred that training and financing assistance that has been received by SMEs is the least effective. Apart from counseling and advice, what they need most is assistance with business linkages and technology development.

#### *5.2.2. Perception by Status in Production Networks*

The overall perception of out-of-production network SMEs of general barriers has a lot in common with the overall sample's perception. Accordingly, this group tends to perceive more internal barriers, with informational barriers, functional barriers, and product and price barriers as its top three most significant barriers, while external barriers are perceived to offer the least hindrance. In contrast, the top three most important obstacles perceived by SMEs in production networks are both external (i.e. business environment barriers) and internal barriers (functional barriers, and product and price barriers). Details of these findings are presented in table 22 below.



**Table 22. Average Rank of General Barriers by Participation in Production Network**

<b>General Barriers</b>	<b>Out</b>	<b>In</b>	<b>Total</b>
Informational Barriers	3.3	4.2	3.4
Functional Barriers	2.8	3.9	3
Product and Price Barriers	2.6	4.1	2.8
Distribution, Logistics & Promotion Barriers	4.5	4.1	4.5
Procedural Barriers	4.4	4.5	4.4
Business Environment Barriers	4.2	3.3	4.1
Tax, Tariff and non-Tariff Barriers	6.4	4.7	6.2
Other Barriers	7.7	7.3	7.7

*Source:* Author's calculation

While the out-of-production network SMEs face circumstances which are not dissimilar to the overall sample, the production network SMEs' circumstances differ greatly. This is because the out-of-production network group characterizes Indonesian SMEs in general, along with their domestic orientation and relatively small size.

**Table 23. Five Strongest Specific Barriers by Participation in Production Network**

<b>No.</b>	<b>Out</b>		<b>In</b>	
1	Poor economic condition (home market)	2.4	Poor economic condition (foreign market)	2.3
2	Shortage of working capital to finance new business plan	2.6	Poor economic condition (home market)	2.9
3	Unreliable market data	2.7	Political instability (home market)	3.3
4	Difficulty in getting credit from suppliers and fin. Institutions	2.7	High costs of customs administration, in exporting or importing (home market)	3.3
5	Difficulty in matching competitor's prices	2.8	Inadequate property rights protection (foreign market)	3.4

*Source:* Author's calculation

All five of the production network group's most significant barriers are external. This situation may imply that respondents which are able to become integrated into production networks are larger in size and higher-quality businesses. This enables them to grow, as they are not restricted by their internal capacity and capability.

The most hindering constraint, according to the production network group, is the poor or deteriorating economic condition of foreign markets. This constraint is followed by the home market's poor or deteriorating economic condition as the second most significant. This could be a signal that respondents in the production network group are no longer domestic-oriented. Even if they are still domestic-oriented, their international trade activities have become an essential part of their business. This feature is also reflected by their perception that high costs of customs administration is one of the biggest obstacles. This emphasizes the fact that this group is largely engaged in international trade, and has moved away from a domestic orientation.

The production network group also sees that political instability can be a great constraint to their growth. Since the respondents of this group are relatively larger in size when compared to the overall sample, and thus employ greater numbers of workers, they face higher financial risk if there is labor turmoil or if the investment climate worsens due to political instability in Indonesia.

It is also very important to note that this group finds that they are impeded by inadequate property rights protection in foreign markets. This can imply that they are not yet fully protected from the threats of plagiarism and/or piracy. Though they are already aware of this, they may find it is too costly for them to take the necessary measures needed to secure their property rights.

Besides this, the production network group seems to be equipped with adequately educated human resources, to such an extent that the respondents from this group perceive constraints related to difficulty with paperwork, contract enforcement and dispute settlement to be unlikely to hinder their operations. Moreover, respondents from this group seem to also be more dynamic with various customer requirements, meaning that they find giving after-sales service and complying with certain product standards is not a burden.

**Table 24. Five Least Hindering Specific Barriers by Participation in Production Network**

<b>No.</b>	<b>Out</b>		<b>In</b>	
1	Restrictive health, safety and technical standard (foreign market)	4.8	Offering technical/after-sales service	4.6
2	Inadequate property rights protection (foreign market)	4.7	Difficulties in enforcing contracts and resolving disputes	4.6
3	High costs of customs administration, in exporting or importing (foreign market)	4.7	Unfamiliarity with complexity of procedures/paperwork	4.6
4	High tax and tariff barriers (foreign market)	4.6	Meeting packaging/labeling requirements	4.5
5	Inadequacy of basic and IT infrastructure (foreign market)	4.5	Anti-competitive or informal practice	4.5

*Source:* Author's calculation

Furthermore, the out-of-productionnetwork respondents find that Financing as type of assistance which can help them to overcome their problems. This is consistent with their perception on general barriers and specific barriers as stated in Table 22 and 23 above. On the other hand, the production network respondents find that Market Information as type of assistance which can help them to overcome problems they face. This also coherent with the general barriers (business environment barriers) and specific barriers that they perceive to be most hindering.

**Table 25. Summary of Assistance by Participation in Production Network**

<b>Types of Assistance</b>	<b>Out</b>	<b>In</b>	<b>Total</b>
Training	3.9	4	3.9
Counseling and Advice	5.1	3.6	4.9
Tech. Dev. And Transfer	4.5	4.3	4.4
Market Information	3	2.8	3
Business Link. And Networking	4.3	4.1	4.3
Financing	2.7	5.3	3
Overall Improv. in Investment Climate	4.7	3.9	4.6

*Source:* Author's calculation

## **6. Conclusion and Policy Implications**

The survey reveals that there are significant differences between the characteristics and perceptions of the production network group and those of the out-of-productionnetwork group. These variations in perceptions result from differences in group characteristics and the circumstances these two groups face. Therefore, different policy approaches are recommended.

### **6.1. The Out-of-Production Network Group**

An overall feature of this group is that they are, on average, domestic-oriented. This orientation may prevail due to two reasons. First, some SMEs may already have sufficient information or potential to participate in a regional production network. However, they may be incapable of participating because of insufficient capital to grow their business or inadequate human resources to fulfill demand for higher quality and quantity. Second, some SMEs may not have enough access to information about potential business in regional production networks. This kind of SME may have few or no staff or management with high-level education, people who would have better access to this kind of information, and would have better ability to understand and identify the potential gains from information about regional production networks.

The two reasons elaborated above are also in accordance with the group's perception that the most significant barriers are internal barriers. Therefore, policy for the promotion of this group should concentrate on overcoming internal weaknesses. Another objective should also be to increase SMEs' access to information about potential business in regional production networks.

*Training.* Assistance in the form of training for the out-of-productionnetwork group should include training in simple modern management methodology. Many SMEs in this group do not conduct formal accounting and utilise modern management methodology in running their business. This situation has prevented them from getting opportunities to expand their business, such as receiving bank loans. Moreover, low quality of management seems to prevent them from implementing capital expansion,

which is a key element in company growth. It is argued that it is common to find SMEs which do not calculate depreciation costs. Therefore, there is skepticism that their reported profit margins do not represent net profit because depreciation costs are not incorporated into their calculations.

Training in the utilization of simple information systems will also be beneficial for SMEs in this group. This kind of training can help them to source and understand more complete market information, as well as increase their exposure to potential suppliers and customers. Such training can be as simple as training in how to utilize email and the Internet, how to make blogs or websites to sell products, how to find relevant information in the Internet, and how to join Internet-based business portals.

However, knowing that the central government's ability to reach out to SMEs which are dispersed throughout the archipelago is limited, it is proposed that such training should be actively implemented by local governments. Surely, central governments should provide assistance in order to give local governments greater capacity to implement the programs.

Assistance in the form of training should be customized so that it is easily understood and applied. Entrepreneurs of SMEs usually learn business skill through their own experiences and from their families. As is also revealed by the survey, most SMEs are managed or owned by people with a relatively low level of education. They also employ more unskilled labor, which makes their production process rather simple or need special skills which not necessarily are obtained in schools. Hence, training should not necessarily use highly scientific terminologies, and should embrace and not underestimate the participants' self-acquired business knowledge and production skills. Criticism of previous training assistances provided by the government, especially the Ministry of Industry and state owned enterprises are mentioned by Turner (2003). According to her, this training has been problematic and ineffective because it is not easily understood and implemented, and tends to discourage SMEs due to prejudice from their traditional mindset.

Especially for training in exporting and importing practice, the Ministry of Trade has been operating the Indonesia Export Training Center (IETC) or Balai Besar Pendidikan dan Pelatihan Ekspor Indonesia (PPEI) since 1990 under the supervision of Balai Pengembangan Ekspor Nasional/BPEN (National Agency for Export

Development/NAFED). This institution provides various kinds of training ranging from Exporting Procedural Class to very specific classes such as Garment Merchandising. They do apply some fees to each class but those fees are relatively affordable. Urata (2000) also mentioned that many entrepreneurs are willing to pay the fees, because they find that the benefit they receive is worth the fees. NAFED also has built several other training centers known as Regional Export Training and Promotion Centers (RETPC) in major cities on Indonesia's four biggest islands. Those cities are Medan in Sumatra, Surabaya in East Java, Banjarmasin in Kalimantan and Makassar in Sulawesi. These training and promotion centers provide training in export procedure as well as training in local specific needs such as entrepreneurship and product innovation. Some centers provide training for free, while some charge fees which are relatively cheap due to subsidies provided by the Ministry of Trade. These centers also provide consultation facilities for their alumni, especially consultation on promotion and marketing. They also arrange trade fairs and promotion events for SMEs in their regions. The training center in Surabaya even organizes buyer meetings for its participants, while the training center in Medan cooperates with Universitas Sumatera Utara in offering classes on entrepreneurship for its students. However, since these centers are relatively new compared to the IETC, they cannot hold training very frequently. Some training is only available twice a year. Furthermore, unlike the IETC, these centers do not provide simulation (e.g. role play, visits to port and custom agency) in their training materials.

*Counseling and Advice.* It is recommended that training in simple management systems and accounting systems for SMEs, especially small scale businesses, should be followed by counseling and advice programs. By integrating counseling and advice into training assistance, policy makers can ensure that the participating SMEs are able to correctly implement the skills and knowledge they receive from the training. This kind of follow-up program of counseling and advice should be sufficient if performed on a temporary basis, for a period of, for example, three months after the training.

The IETC provides counseling and advice assistance for its alumni. This consultation assistance aims to boost IETC's alumni to be able to export faster, or to strengthen their current export activities. The IETC cooperates with Pusat-Pusat Pengembangan Pasar Wilayah (Centers of Regional Market Development) which are

also subunits of NAFED, and other relevant agencies. Consultation assistance range from assistance with export marketing, production, and finance to human resources. Similarly, RETPCs also provide consultation facilities for their alumni. However, they mostly provide consultation on promotion, marketing and export procedure.

Given that such assistance is already provided by the government, it still seems that there are many SMEs that are not exposed to such information or facilities yet. Most institutions mentioned previously already have websites with relatively sufficient information that can be easily accessed through the Internet. Therefore, one of the keys to improving SMEs' access to information, as well as capacity building, is to make it commonplace for them to use the Internet in conducting their business. Moreover, local government agencies that are responsible for SME promotion should be able to spread the information to SMEs in their regions.

*Financial support.* There are several conditions which relate to the SMEs' financial problems. First, some SMEs do not have assets that can be given to creditors as collateral. Some of these SMEs even decide to take commercial loans with high interest rates to finance their business. Second, there are also SMEs that are willing to take loans, but do not meet commercial bank standards. Third, the survey also finds that retained earnings and personal savings are the two main financial sources for SMEs in general, and SMEs out of production networks. This finding implies that some SMEs may not be well exposed to various financial sources. In addition, they tend to be risk-averse in making decisions to expand their businesses using third party funding.

The national government of Indonesia has provided some assistance to overcome financial problems among SMEs. In 2007, the government launched the Kredit Usaha Rakyat/KUR (People's Business Credit) which is provided for small businesses that are bankable but own insufficient collateral. In the program, the government and some cooperating state banks provide the guarantee fees for the credit, whereas the interest rate is determined by the Minister of Finance. Until now, the maximum interest rate is set at 16%. Before KUR, there were various kinds of subsidized credit programs provided by previous governments. Besides lack of coordination problem within government institutions, those programs are evaluated to be ineffective and inefficient

due to the moral hazards they caused, and the inadequate capability of commercial banks to channel credit for SMEs.

The KUR gave credit to more than 2 million debtors up to October 2009 (Ministry of Cooperatives and SME, 2009). However, this amount is relatively small compared to the number of SMEs which need such credit. The program also needs more extensive usage and acceptance in order to have a significant impact on the promotion of SMEs. Better promotion of the program will also provide those SMEs that have limited information about and access to financial markets with more affordable and feasible sources of funding.

Apart from KUR, in the year 2006 the government also established Lembaga Pengelola Dana Bergulir/LPDB (Revolving Fund Institution) which aims to develop and provide credit access to SMEs that do not meet commercial banks' standards, as well as strengthen micro-finance institutions that provide loans to SMEs. The institution was formed to manage previous revolving funds that have been channeled to cooperatives and SMEs by the Ministry of Cooperatives and SMEs since 2001. However, it seems that many SMEs are not yet fully aware of the existence of this institution. The institution itself promotes its loan programs through micro-finance institutions such as cooperatives.

Both the KUR and LPDB do not provide further managerial assistance to their debtors. In fact, SMEs out of production networks, as well as those in the overall sample, have weaknesses in their managerial capacity and capability. It is proposed that financial support program should be provided, accompanied by capacity building programs such as business assistance in the form of counseling and advice, business coaching, and training. However, it is also acknowledged that loan providers such as cooperating state banks and the LPDB may not have sufficient resources to provide this kind of assistance. Although the LPDB does support venture capital companies which provide financial sources along with business assistance, many SMEs do not have prerequisites, such as modern accounting report systems, for receiving credit from venture capital companies. Therefore, these two programs are suitable for overcoming the financial problems of SMEs which either have insufficient collateral or are unable to meet commercial banks' standards.



Other policy should take the form of giving SMEs access of information about leasing opportunities. SMEs can benefit from leasing activities in financing their long-term investment e.g. purchasing machinery and in medium term investment such as purchasing personal computers. This kind of assistance will support other assistance such as training in modern management systems or training in simple information and communication technology which will recommend that SMEs own a computer in order to be effective. When assisted with the procurement of personal computers, SMEs will benefit by having access to wider and more thorough market information.

Thus, more integrated policies are needed in order to solve financial problems faced by SMEs which are either not well-exposed to financial markets or reluctant to borrow from third parties. This problem will not be solved solely by providing financial support. The reason for this is that the problem lies with the capability and culture of the owners or managers of SMEs. Put simply, policies aiming to improve the education level and skills of SME owners and managers could be the best solution. Such policies can take the form of business coaching, which gives training and supervision for SMEs in using modern accounting reporting systems for their businesses. It can also take the form of financial management workshops and assistance which can educate SMEs in managing funds effectively and efficiently. Given the limitations of the central government to reach out to SMEs with such programs, more active participation of regional governments is necessary. In this matter, such policies should be implemented directly by regional governments for SMEs in their regions.

*Market Information.* Market information assistance can take form of trade fairs and exhibitions. Recently, there have been relatively numerous trade fairs and exhibitions held in Indonesia, especially in Jakarta. Those are, for example, INACRAFT and Trade Expo Indonesia. Those events are very effective tools in widening SMEs' market potential, as well as enriching SMEs with better market information. However, those events are particularly effective for SMEs which produce end-user products. For manufacturing SMEs which produce intermediary products, and whose target customers are final assemblers and or other manufacturers, other kinds of trade fairs are necessary. These kinds of trade fairs, sometimes referred as Reverse Trade Fairs, can introduce SMEs to large enterprises or final assemblers looking for vendors.

*Improvement in Investment Climate.* The survey reveals that many SMEs who are not in the -production network group are subsistence producers. Many of them do not invest their capital, and experience revenue fluctuations. Consequently, these SMEs tend to grow slowly and are vulnerable to external shocks, especially from the domestic market, due to their domestic orientation. The financial problems revealed by the survey also show that these SMEs find it costly to get formal business permissions.

Thus, any decision to boost economic growth so as to improve the investment climate will surely benefit SMEs that are out of production networks. First, higher per-capita income will positively stimulate domestic consumption and, as a result, demand for SMEs' products will grow. Second, higher economic growth will also encourage large enterprises to make more investments, as well as create more business potential for SMEs as their suppliers. Lastly, helping SMEs to move away from their subsistence level will allow them to make longer-term investments and therefore experience sustainable growth.

Policies that aim to cut bureaucracy and complexity in obtaining business licenses will also encourage SMEs that have been refusing to do it, and have remained in the "informal" sector. Thus, these policies can help such SMEs to be bankable, and allow them to get access to formal financial sources.

## **6.2. The Production Network Group**

This group has some significant differences compared to out-of - productionnetwork Group. First, respondents in this group are, relatively larger in size, and thus employ more workers. Most of them are already no longer classified as small-scale businesses, but as medium scale businesses. This may imply that this group has more capacity to grow, when compared to the other group. It means also that they have the ability to utilize the benefits of economies of scale. Furthermore, they position international trade as an essential part of their business activities, although some of them are domestic-oriented since most of their products are sold domestically. Moreover, they use a wider variety of sources of funding, which include bank loans and credit from other financial institutions. It means that, in contrast with the out-of-productionnetwork group, respondents in production network group are more exposed to sources of funding offered by the financial markets. It also implies that members of the production

network group are less risk-averse in making the decision to expand their businesses, and become committed to third party lenders. In addition, respondents in the production network group have a higher percentage of workers who have high level of education. This indicates that SMEs in the production network group have better ability not only to get information about potential business in regional production networks but also to capitalize on this potential and integrate it into their business.

For SMEs operating within production networks, external barriers are perceived to be the most significant, whereas internal barriers are the least. It goes hand in hand with their relatively larger size and higher quality of human resources, which that they are no longer deprived and constrained by their internal weaknesses.

*Market Information.* The survey reveals that there are no specific obstacles directly related to market information that are perceived as the most significant by this group. However, we argue that some assistance with the provision of market information can help them to be less vulnerable when handling external shocks from the foreign and home markets. This assistance should be able to help them to expand their business by giving them the opportunity to provide products to a wider and more captive market.

Recommended market information assistance includes, for example, improvements in IT infrastructure. Although access to information systems such as the Internet is relatively affordable for respondents in the production network group, there is no integrated infrastructure that works to connect Indonesian SMEs with potential buyers and suppliers. The government has started to build the UKM Innovation Center, which will provide such services. For example, in 2008 and 2009 the government focused their attention on the creation of the 'SMEs' Gateway Portal' at the UKM Innovation Center. However, the realization of this project seems to fail to be fully implemented. On the other hand, the Ministry of Cooperatives and SME has several websites that give the information that SMEs need in order to promote themselves in the Internet. One of them, [www.indonesian-products.biz](http://www.indonesian-products.biz), provides links to, and company profiles of, several SMEs. The profiles are presented in English and are attached with pictures of SMEs' products. It is a good step but absolutely insufficient.

On the other hand, NAFED's website provides relatively comprehensive information on Indonesian products, and on business entities which participate in

international trade. It also functions as a business portal because it provides a trade database showing Indonesian export and import companies, with user-friendly classification. Moreover, it offers some publications in its market intelligence section which can provide website visitors with information about potential markets for Indonesian products. Moreover, the website also displays profiles of the best Indonesian products and potential products. Simultaneously, IETC's website also provides extensive links to other parties, ranging from other government agencies such as NAFED, Indonesian Trade Promotion Centers (ITPC) and the Customs Agency to international institutions such as Japan International Cooperation Agency (JICA), Centre for the Promotion of Imports from Developing Countries (CBI) of the Netherlands Department of Foreign Affairs, and the Canadian Trade Facilitation Office (TFO). Moreover, the website also provides detailed links to various agencies in around 140 other countries.

*Business Linkages and Networking.* Many of respondents classified as the production network group are integrated into value chain networks through outsourcing. This practice is especially common in the manufacturing industry. In order to be able to participate, a company has to follow certain standards and requirements (e.g. quality, cost, delivery and innovation) set by overseas principal companies. For those already participating in the networks, widening cooperation will surely help them to grow. Having such linkages and networks will also give them stronger and better security of revenues for longer periods of time. This will lead to greater assertiveness of SMEs in making longer-term investments, which greatly determine their growth sustainability. Assistance with such linkages and networking can be promoted by related government agencies such as the Ministry of Industry, the Ministry of Trade and the Ministry of Cooperatives and SME.

To this end, the Ministry of Trade cooperates with the Ministry of Foreign Affairs in providing assistance in the form of building linkages and networking between Indonesian business and potential international partners, by building the Indonesian Trade Promotion Center (ITPC). So far, there are six ITPCs worldwide. They are located in Los Angeles, Sao Paulo, Budapest, Dubai, Johannesburg and Osaka. These ITPCs provide assistance in the form of provision of market information and

regulations, assistance and arrangement in making and developing business contacts, provision of market access and market penetration, and assistance with trade missions and exhibitions.

The Ministry of Cooperatives and SME should invariably cooperate with related government agencies such as the Ministry of Trade, the Ministry of Industry, the National Statistic Bureau, the Ministry of Foreign Affairs and local governments to implement SME promotion policies as comprehensively as possible. Although there is some positive and real support provided for the promotion of SMEs by local governments, it is very limited. One example is the revolving fund known as Program Pemberdayaan Masyarakat Kelurahan/ PPMK (Community Empowerment Program), which is provided by the provincial government of Jakarta. Hence, the Coordinating Minister of Economy should be committed to this effort and put greater emphasis not only on processes but also on results.

## References

- Barry, Albert, Rodriguez, Edgard; & Sandee, Henry (1999). *Firm and Group Dynamics in the Role of the SME Sector in Indonesia*.
- Indonesia Export Training Center (2010). *Pendidikan dan Pelatihan Ekspor Indonesia*. Jakarta: PPEI BPEN Departemen Perdagangan RI. <http://www.ppei.go.id> (accessed 10 March 2010).
- LPEM FEUI (2009). *SME Policies in Electronic Industry and Auto Parts Industry in Indonesia*.
- Ministry of Cooperative and Small and Medium Enterprises (2010). *SMESCO Trading Board*. Jakarta: Ministry of Cooperative and Small and Medium Enterprises. <http://indonesianproducts.biz/smesco/main.php> (accessed 8 March 2010).
- Ministry of Cooperative and Small and Medium Enterprises, Deputi Bidang Pengembangan dan Restrukturisasi Usaha, <http://www.sentrakukm.com/index.php/kur/perkemb-kur> (accessed 4 February 2010).
- Ministry of Cooperative and Small and Medium Enterprises, Small and Medium Enterprise Statistics 2006 – 2007. [www.depkop.go.id](http://www.depkop.go.id) (accessed 17 August 2009)
- National Agency for Export Development (2010). *National Agency for Export Development Ministry of Trade*. <http://www.nafed.go.id> (accessed 10 March 2010).
- Sandee, Henry, *et.al SME Clusters in Indonesia: An Analysis of growth dynamics and employment conditions*, Jakarta: International Labour Office (ILO)
- Tambunan, Tulus (2006) “SME Development in Indonesia with Reference to Networking, Innovativeness, Market Expansion and Government Policy”. ERIA Research Project, no.5
- Tambunan, Tulus (2007) “Trade and Investment Liberalization Effects on SME Development: A Literature Review and Case Study of Indonesia.” ARTNeT Regional Study on Trade and Investment Coordination Working Paper No.42. <http://www.artnetontrade.org> (accessed 19 August 2009).
- Thee, Kian Wie (2006) “Policies for Private Sector Development in Indonesia”. ADB Institute Discussion Paper No. 46.
- Turner, Sarah (2003) *Indonesia’s Small Entrepreneurs: Trading on the Margins*. London: RoutledgeCurzon.
- Urata, Shujiro (2000) *Policy Recommendation for SME Promotion in the Republic of Indonesia*.
- World Bank (2003). *Indonesia: Gagasan untuk Masa Depan 2003*. Jakarta: World Bank Indonesia. <http://go.worldbank.org/IST4RD59Z0> (accessed 17 August 2009).

**APPENDIX 1. List of Industries (ISIC 2 and ISIC 5)**

<b>Industry</b>	<b>ISIC 2</b>	<b>ISIC 5</b>	<b>Description</b>
A	17 (Textiles)	17124	Batik
		17302	Knit wear
		17303	Knited sock
		17304	Other knited materials
	18 (Wearing Apparel)	18101	Wearing Apparel made of textile (garments)
		18102	Other wearing apparel made of textile
		18104	Other wearing apparel made of leather
	18202	Furs	
B	34 (Motor Vehicles, trailers and semi-trailers)	34100	Motor vehicles
		34200	Motor vehicles bodies
		34300	Motor vehicles component and apparatus
	35 (Other Transport Equipment)	35111	Ships/Boats
		35112	Ship parts and Equipments
		35201	Railroad Equipments
		35301	Aircraft and components
		35911	Motor cycles
		35912	Motorcycle component and apparatus
		35921	Bicycle and tricycles
		35922	Bicycle and tricycles components
		29111	Steam engine, turbine and windmill
		29112	Internal combustion engine
		29113	Components and parts of prime movers
29114	Alteration and repair prime mover		
29120	Pump and compressor		
29130	Mechanical power transmission equipment		
29141	Non electrical stove and heater for comercial purpose		
29142	Stove, oven and heater		
29150	Lifting and moving machineries		
29191	Packing, botting, and canning machine		
29292	Weighing machine		
29193	Refrigerating machine for comercial purposes		
29199	Other general purpose machine		
29211	Agricultured and forestry machine		
29212	Supporting services for agriculture and forestry machineries industry		
29221	Machine tools for metal working		
29222	Machine tools for wood working		
29223	Machine tools for other than metal and wood working		
29224	Wlwctric welding machine tools		
29230	Machinery for metalurgy		
29240	Machine for minning, quarrying, and construction		
C	29 (Machinery and Equipment n.e.c)		

Continued

C	29 (Machinery and Equipment n.e.c)	29111	Steam engine, turbine and windmill
		29112	Internal combustion engine
		29113	Components and parts of prime movers
		29114	Alteration and repair prime mover
		29120	Pump and compressor
		29130	Mechanical power transmission equipment
		29141	Non electrical stove and heater for comercial purpose
		29142	Stove, oven and heater
		29150	Lifting and moving machineries
		29191	Packing, botting, and canning machine
		29292	Weighing machine
		29193	Refrigerating machine for comercial purposes
		29199	Other general purpose machine
		29211	Agricultured and forestry machine
		29212	Supporting services for agriculture and forestry machineries industry
		29221	Machine tools for metal working
		29222	Machine tools for wood working
		29223	Machine tools for other than metal and wood working
		29224	Wlwttric welding machine tools
		29230	Machinery for metalurgy
		29240	Machine for minning, quarrying, and construction
		29250	Machinery for food, beverages, and tobacco processing
		29261	Sewing cabinet
		29262	Sewing, washing and drying mechine
		29263	Textile machineries
		29264	Sewing machine needles
		29270	Guns and ammunitions
		29291	Printing machineries
		29292	Machine for pulp and paper industry
		29299	Other special purpose machinery
		29301	Non electric stove cooking range and space heater
		29302	Household with electronical appliances
		29309	Other household electronical appliances
	30 (Office, Accounting, and Computing Machinery)	30001	Manual office, computing and accounting machineries
		30003	Electrical office, computing and accounting machineries
		30004	Foto copy machineries
		30101	Electric motors
	31 (Electrical Machinery and Aparatus n.e.c)	31101	Electric motors
		31102	Electric generators
		31103	Transformer, rectifier and voltage stabilizers
		31201	Electric panel and swich gear
		31202	Electric control apparatus
		31300	Electric and telephone cables
		31401	Dry cell batteries
		31402	Alectrical accumulator
		31501	Bulb, spot light and ultra violet lamps
		31502	Tube gas lamp
		31509	Electric lamp components
		31900	Other electrical apparatus and components
		31501	Bulb, spot light and ultra violet lamps
		31502	Tube gas lamp
		31509	Electric lamp components
		31900	Other electrical apparatus and components
		32 (Radio, Television, and Communication Equipment and Apparatus)	32100
	32200		Communication equipments
	32300		Radio and TV reciver, sound and video recording and accosiates goods



## CHAPTER 11

### **Integrating SMEs into the East Asian Region: The Philippines**

**RAFAELITA ALDABA,**

**ERLINDA MEDALLA,**

**FATIMA DEL PRADO**

**DONALD YASAY<sup>1</sup>**

Philippine Institute for Development Studies (PIDS)

*The paper aims to examine the characteristics and factors that constrain the growth of SMEs operating both within and outside production networks. Based on a survey of 101 firms, the analysis shows that SMEs are not homogeneous. While they share certain characteristics such as age, Filipino ownership and foreign equity share; they differ in terms of performance, export intensity, interest rates on borrowings, major sources of finance, and other economic indicators. The results also show that participation in IPNs benefits SMEs, particularly parts and components makers in the electronics and auto industries. In terms of performance, IPN firms have higher mean growth rates and mean labor productivity than non-IPN firms. In terms of barriers to growth, IPN firms are primarily concerned with product and price barriers and difficulties in establishing and maintaining trust with business partners while non-IPN firms' major concerns are tax, tariff and non-tariff barriers and the country's deteriorating business environment. Two themes dominate SMEs' concerns about the type of assistance needed. For IPN firms, financing assistance is crucial while for non-IPN firms, technology development is the most important.*

---

<sup>1</sup> The firm survey used in the paper was carried out by the National Statistics Office (NSO) under the leadership of Ms. Estela de Guzman, Director, Industry and Trade Statistics Department, Ms. Dulce Regala, Chief, Industry Statistics Division and Ms. Lourdes Homecillo, Regional Director, National Capital Region. The very valuable contribution made by the NSO team is gratefully acknowledged.

## **1. Introduction**

The past two decades have witnessed the deepening of economic integration among countries as restrictions on the free flow of trade and investment are removed and globalization forces are heightened. In more recent years, however, the uncertainty surrounding the successful conclusion of the World Trade Organization (WTO)'s multilateral trade negotiations has led to a new wave of regionalism through the surge in free trade agreements (FTAs). In the Asia Pacific region, for instance, the number of FTAs increased substantially from 54 in 2000 to 216 as of June 2009 (ADB Asia Regional Integration Center <http://www.aric.adb.org/1.php> accessed on Jan. 6, 2010).

Apart from enacting FTAs with Japan, China and Korea; the Association of Southeast Asian Nations (ASEAN) has been actively engaged in negotiating FTAs with Australia-New Zealand and India and considering negotiations with the EU. ASEAN members like Thailand and Singapore are aggressive in seeking bilateral FTAs. China has suggested the creation of an East Asian FTA with ASEAN, China, Japan and Korea (ASEAN plus 3), while Japan proposed the creation of a larger FTA in East Asia to include Australia, New Zealand and India, known as ASEAN Plus 6 or Comprehensive Economic Partnership of East Asia (CEPEA).

Amid the ongoing regional integration in ASEAN and East Asia, it is crucial to understand both the opportunities and challenges arising from this trend of increasing regionalization and how this will affect the growth and development of small and medium enterprises (SMEs). Given their substantial contribution to the economy, SMEs play a critical role in the economic growth and industrial development of developing countries. It is also important to note that the remarkable economic growth in the East Asian region has been accompanied by de facto economic integration driven largely by the development of international and regional production networks (IPNs and RPNs) and distribution networks. In light of rising globalization and increasing economic integration in East Asia, SMEs are seen as potential suppliers of outsourced parts and services and could provide a link to the export sector and/ or RPNs which have increasingly grown in manufacturing sectors such as automotive, machinery, electronics and garments.

In the Philippines, micro and small and medium enterprises comprise 99 percent of all manufacturing enterprises and any improvement in their capabilities is important both economically and socially. Understanding how SMEs could be integrated into the whole process of regional integration, particularly with regard to how best they should increase their participation in regional production networks, is crucial in the formulation of policies for the growth and development of SMEs not only at a national level but also at a regional level.

The main objective of the study is to closely examine the constraints to SME growth and understand the factors affecting their participation in IPNs. SME literature in the Philippines abounds with studies focusing on the analysis of various SME government policies and programs covering issues related to finance, technology, export promotion, marketing, logistics and human resource development and training. However, there are only a limited number of studies focusing on SME participation in regional production networks and analysis of the impact of free trade agreements on SMEs.

This paper contributes to the existing literature by differentiating between the characteristics and constraints faced by firms that are operating within IPNs and those operating outside of them. It will examine the characteristics and review the factors affecting the growth of the two groups and identify the major factors affecting their participation in production networks. In the analysis, both internal and external factors will be analyzed. Internal factors refer to firm-level variables affecting operations and performance and which are associated with the firm's organizational resources and capabilities. External factors are those affecting the domestic environment within which the firm operates, such as government policies and programs, infrastructure, logistic support and other business environment factors.

A survey is conducted to gather firm level information on constraints to SME growth and factors that determine successful participation in regional production networks. The following industries are covered in the survey: electronics, automotive and transport, garments, and food manufacturing and processing.

The paper is divided into six sections. Following the introduction, section two discusses the current state of Philippine SMEs in the manufacturing industry in terms of structure, performance and major constraints to growth and development. Section three

presents the extent of SME participation in three RPN industries: electronics, automotive and garments. Section four presents the major findings on the internal and external barriers that SMEs face while section five provides an in-depth analysis of the results focusing on the constraints to growth and factors affecting SME participation in RPNs. Section six summarizes the major findings and policy implications of the paper.

## **2. SMEs in the Philippine Manufacturing Industry**

### **2.1. Structure and Economic Performance**

There are two operational definitions of small and medium enterprises in the Philippines: one is employment-based whilst the other is asset-based. Based on the National Statistics Office (NSO) and Small and Medium Enterprise Development Council Resolution No. 1 Series 2003, the different size categories of enterprises are defined as:

Small enterprises	: 10-99 employees
Medium	: 100-199 employees
Large	: 200 or more employees

Enterprises with 1-9 workers are considered as micro enterprises.

In terms of total assets, the size categories are defined as:

Small enterprises	: P3-15 million
Medium	: P15-100 million
Large	: P100 or more

Enterprises with P3 million or less are classified as micro-enterprises. The employment-based definition will be adopted in the paper.

In terms of the number of enterprises, micro and small and medium enterprises (MSMEs) dominate the economy and accounted for almost 99.7% of the total number of establishments in 2006 (see Table 1, last row). Micro-enterprises are more predominant than small and medium enterprises. Geographically, both micro and SMEs are highly concentrated in the National Capital Region (NCR) and the Calabarzon area.

**Table 1. Number of Establishment in the Philippines by Side and Industry, 2006**

Industry Sector (1)	TOTAL (2)	% (3)	MICRO (4)	% (5)	SMEs (6)	% (7)	LARGE (8)	% (9)
Agriculture, Hunting & Forestry	4199	0.5	2631	0.4	1447	2.4	121	4.7
Fishery	1447	0.2	890	0.1	529	0.9	28	1.1
Mining and Quarrying	319	0.0	217	0.0	87	0.1	15	0.6
Manufacturing	117346	15.0	105083	14.6	11278	18.7	985	37.9
Electricity, Gas and Water	1399	0.2	559	0.1	736	1.2	104	4.0
Construction	2488	0.3	1352	0.2	1063	1.8	73	2.8
Wholesale and Retail Trade	391448	50.0	373721	51.9	17494	29.0	233	9.0
Hotels and Restaurants	97975	12.5	90121	12.5	7805	12.9	49	1.9
Transport, Storage & Communications	9405	1.2	7035	1.0	2256	3.7	114	4.4
Financial Intermediation	23312	3.0	18679	2.6	4524	7.5	109	4.2
Real Estate, Renting & Business Activities	45722	5.8	40936	5.7	4357	7.2	429	16.5
Education	11857	1.5	6699	0.9	4952	8.2	206	7.9
Health and Social Work	31443	4.0	29996	4.2	1364	2.3	83	3.2
Community, Social & Personal Service Activities	44705	5.7	42272	5.9	2386	4.0	47	1.8
<b>TOTAL</b>	<b>783065</b>	<b>100.0</b>	<b>720191</b>	<b>100.0</b>	<b>60278</b>	<b>100.0</b>	<b>2596</b>	<b>100.0</b>
<b>% of TOTAL</b>	<b>100.0</b>		<b>92.0</b>		<b>7.7</b>		<b>0.3</b>	

In terms of distribution by sector, most enterprises are in the wholesale and retail trade sector, notably in the micro category. As Table 1 (column 3) shows, this sector accounted for 50 percent of the total number of establishments, followed by manufacturing with a share of 15 percent. Hotels and restaurants are third with a share of 13 percent.

Among SMEs, wholesale and retail trade also dominates with a share of 29 percent, followed by manufacturing with a share of 19 percent of the total number of SMEs (see Table 1, column 7). On the other hand, among large enterprises, manufacturing comprised the bulk at 38 percent of the total number (see column 9).

In terms of employment, Table 2 shows that SMEs contributed 33 percent of the total number of workers in all enterprises. Manufacturing and wholesale and retail trade accounted for approximately the same share at 8 percent each. Among large enterprises, manufacturing jobs also comprised the bulk with a share of 15 percent of the total. Meanwhile, for micro-enterprises, jobs generated by the wholesale and retail trade consisted of the bulk with a share of 16 percent while manufacturing jobs contributed only 5 percent of the total.

**Table 2. Employment Distribution by Sector, 2006**

Industry Sector	TOTAL	%	MICRO	%	SMEs	%	LARGE	%
Agriculture, Hunting and Forestry	143592	2.9	9970	0.2	50054	1.0	83568	1.7
Fishery	30978	0.6	3269	0.1	13771	0.3	13938	0.3
Mining and Quarrying	14845	0.3	850	0.0	2675	0.1	11320	0.2
Manufacturing	1372911	27.5	259664	5.2	385263	7.7	727984	14.6
Electricity, Gas and Water	83536	1.7	2717	0.1	33831	0.7	46988	0.9
Construction	94101	1.9	5528	0.1	36958	0.7	51615	1.0
Wholesale and Retail Trade	1283494	25.7	790398	15.9	391127	7.8	101969	2.0
Hotels and Restaurants	448747	9.0	227978	4.6	199175	4.0	21594	0.4
Transport, Storage and Communications	185184	3.7	25928	0.5	67087	1.3	92169	1.8
Financial Intermediation	258864	5.2	70944	1.4	90417	1.8	97503	2.0
Real Estate, Renting and Business Activities	493609	9.9	99752	2.0	142370	2.9	251487	5.0
Education		0.0		0.0		0.0		0.0
Health and Social Work	270330	5.4	26678	0.5	153587	3.1	90065	1.8
Other Community, Social and Personal Service Activities	133645	2.7	48718	1.0	44560	0.9	40367	0.8
	171047	3.4	95430	1.9	49156	1.0	26461	0.5
<b>TOTAL</b>	<b>4984883</b>	<b>100.0</b>	<b>1667824</b>	<b>33.5</b>	<b>1660031</b>	<b>33.3</b>	<b>1657028</b>	<b>33.2</b>

Within the manufacturing industry, the large bulk of Philippine enterprises are micro-enterprises, which comprised 90% of the total in 2006, while SMEs and large enterprises accounted for 10% and 1% of the total number of manufacturing enterprises, respectively (see Table 3). Firms in the food and beverage sector dominated with a share of 47% followed by wearing apparel (13%) and fabricated metal products excluding machinery and equipment (11%).

**Table 3. Number of Establishments in Manufacturing, 2006**

Manufacturing Sub-sector	Total	%	Micro	%	SMEs	%	Large	%
Food Products and Beverages	55189	47.03	51882	44.21	3125	2.66	182	0.16
Tobacco Products	26	0.02			15	0.01	11	0.01
Textiles	1497	1.28	1122	0.96	342	0.29	33	0.03
Manufacture of Wearing Apparel	15759	13.43	14379	12.25	1244	1.06	136	0.12
Tanning and Dressing of Leather, Manufacture of Luggage, Handbags and Footwear	1590	1.35	1240	1.06	333	0.28	17	0.01
Wood, Wood Products and Cork, Except Furniture; Articles of Bamboo, Cane, Rattan and the like; Plaiting Materials	3440	2.93	3004	2.56	416	0.35	20	0.02
Paper and Paper Products	559	0.48	252	0.21	285	0.24	22	0.02
Publishing, Printing and Reproduction of Recorded Media	3887	3.31	3023	2.58	850	0.72	14	0.01
Coke, Refined Petroleum and Other Fuel Products	18	0.02			15	0.01	3	0.00
Chemicals and Chemical Products	1133	0.97	485	0.41	601	0.51	47	0.04
Rubber and Plastic Products	1291	1.10	651	0.55	589	0.50	51	0.04
Other Non-Metallic Mineral Products	5179	4.41	4693	4.00	450	0.38	36	0.03
Basic Metals	1050	0.89	658	0.56	361	0.31	31	0.03
Fabricated Metal Products except Machinery and Equipment	13024	11.10	12304	10.49	682	0.58	38	0.03
Machinery and Equipment Not Elsewhere Classified	3020	2.57	2428	2.07	570	0.49	22	0.02
Office, Accounting and Computing Machinery	73	0.06	9	0.01	43	0.04	21	0.02
Electrical Machinery and Apparatus, Not Elsewhere Classified	290	0.25	67	0.06	183	0.16	40	0.03
Radio, Television and Communication Equipment and Apparatus	263	0.22	24	0.02	119	0.10	120	0.10
Medical Precision and Optical Instruments, Watches and Clocks	122	0.10	42	0.04	55	0.05	25	0.02
Motor Vehicles, Trailers and Semi-Trailers	703	0.60	536	0.46	139	0.12	28	0.02
Other Transport Equipment	425	0.36	330	0.28	82	0.07	13	0.01
Manufacture and Repair of Furniture	7227	6.16	6624	5.64	564	0.48	39	0.03
Recycling	92	0.08	58	0.05	34	0.03	0	0.00
Manufacturing, Not Elsewhere Classified	1489	1.27	1263	1.08	207	0.18	19	0.02
<b>Total</b>	<b>117346</b>	<b>100.00</b>	<b>105074</b>	<b>89.54</b>	<b>11304</b>	<b>9.63</b>	<b>968</b>	<b>0.82</b>

Table 4 indicates that from 1999 up to 2006, the total number of SMEs in manufacturing declined from 15,748 to 11,278. The share of SMEs to the total also

dropped from 12% in 1999 to just 9.6% in 2006. Table 5 shows that in terms of employment contribution, the number of workers in SMEs also declined between 1999 and 2006 from 516,506 workers to 385,263. The share of SMEs declined from 31% in 1999 to 28% in 2006.

**Table 4. Number of Manufacturing Enterprises in the Philippines**

Year	MICRO	%	SMEs	%	LARGE	%	TOTAL
1999	113861	87.0	15748	12.0	1322	1.0	130931
2000	108998	86.9	15231	12.1	1238	1.0	125467
2001	108986	88.0	13615	11.0	1194	1.0	123795
2002	108847	88.5	13148	10.7	982	0.8	122977
2003	107398	88.6	12763	10.5	1024	0.8	121184
2004	103926	88.0	13081	11.1	1120	0.9	118127
2005	103982	88.6	12392	10.6	1008	0.9	117382
2006	105083	89.5	11278	9.6	985	0.8	117346

**Table 5. Manufacturing Employment by Size**

Year	MICRO	%	SMEs	%	LARGE	%	TOTAL
1999	366689	21.9	516506	30.8	791277	47.3	1674472
2000	354025	22.3	505062	31.8	730127	45.9	1589214
2001	353415	23.0	446600	29.1	734088	47.9	1534103
2002	353255	24.1	437490	29.8	676443	46.1	1467188
2003	360576	24.7	403923	27.6	698173	47.7	1462672
2004	327112	21.3	432869	28.2	775969	50.5	1535950
2005	323510	22.1	408100	27.9	731736	50.0	1463346
2006	259664	18.9	385263	28.1	727984	53.0	1372911

Year	Number of Firms		Employment	
	SMALL	MEDIUM	SMALL	MEDIUM
1999	14611	1137	361514	154992
2000	14121	1110	354328	150734
2001	12627	988	309952	136648
2002	12128	1020	294487	143003
2003	11910	853	285027	118896
2004	12116	965	299788	133081
2005	11352	1040	270344	137756
2006	10274	1004	252931	132332



In terms of value added, the share of small and medium enterprises (SMEs) increased from 23 percent of the total manufacturing value added in 1994 to 28 percent in 1998 (see Table 6). However, this fell to 21 percent in 2003. Large firms contributed 79 percent of the total, a slight increase on the 72 percent contribution made in 1998.

**Table 6. Value Added Contribution 1994, 1998 and 2003 (in percent)**

Year	1994		1998		2003		2006*	
Establishment Size	SMEs	Large	SMEs	Large	SMEs	Large	SMEs	Large
Total	23	77	28	72	21	79	20	80
Value Added current prices (in billion P)	324.2		664.2		738.95		688.06	

*Note:* 2006 Data covered only the formal sector of the economy.

Table 7 presents the contribution of the different manufacturing sub-sectors to total value added in 2003. Among SMEs, the largest contribution was posted by the food processing and manufacturing sub-sector with a share of just under 21 percent. This is followed by industrial chemicals and other chemicals with a share of 16 percent. Non-electrical and electrical machinery is next with a share of around 10 percent. Transport and garments registered the same share of about 5 percent each.

**Table 7. Manufacturing Value Added by Establishment Size (in %), 2003**

Code		Micro	SMEs	Large	Total
2003	Total ( in million pesos)	24297.56	155072.30	583877.92	763247.77
2006*		5965.04	138869.30	549186.78	694021.12
311	Food Processing	9.96	10.12	7.81	8.35
312	Food Manufacturing	24.56	10.76	5.45	7.13
313	Beverages	4.54	5.23	6.29	6.02
314	Tobacco	0.00	0.05	2.99	2.30
321	Textiles	0.40	3.43	1.15	1.59
322	Wearing Apparel except Footwr	13.65	4.70	2.82	3.55
323	Leather and Leather Products	0.03	0.35	0.68	0.59
324	Leather Footwear	3.05	0.24	0.04	0.17
331	Wood and Cork Products	3.37	1.95	0.38	0.79
332	Furniture except Metal	6.01	3.11	0.45	1.17
341	Paper and Paper Products	0.16	4.05	1.25	1.78
342	Printing and Publishing	5.29	2.94	0.65	1.26
351	Industrial Chemicals	0.60	8.99	1.29	2.83
352	Other Chemicals	1.01	7.21	6.86	6.75
353	Petroleum Refineries	0.00	0.00	18.38	14.06
354	Petroleum and Coal Products	0.03	0.10	0.00	0.02
355	Rubber Products	3.20	1.05	0.66	0.82
356	Plastic Products	0.63	4.54	1.22	1.87
361	Pottery, China and Earthenware	0.25	0.35	0.32	0.32
362	Glass and Glass Products	0.04	0.85	0.64	0.66
363	Cement	0.00	0.03	2.32	1.78
369	Other Nonmetallic Mineral Prods	3.76	1.99	0.42	0.85
371	Iron and Steel	1.02	4.41	0.88	1.60
372	Nonferrous Metal Products	0.03	1.01	1.16	1.10
381	Fabricated Metal Products	11.20	4.36	1.09	2.08
382	Machinery except Electrical	3.66	2.90	6.82	5.93
383	Electrical Machinery	0.49	6.90	20.14	16.82
384	Transport Equipment	1.98	4.81	5.56	5.29
385	Professional and Scientific Eqpt	0.10	0.53	1.78	1.47
390	Miscellaneous Manufacture	0.98	3.05	0.50	1.03
	Total Share (in %)	100	100	100	100

*Note:* 2006 data covered only the formal sector of the economy.

Table 8 presents labor productivity as measured by value added per worker in the manufacturing industry for the years 1994, 1998 and 2003. On the whole, though an increase in the labor productivity of both SMEs and large enterprises was registered between the years 1994 and 1998, both fell in 2003. For SMEs, labor productivity dropped from P139,000 to P97,000 while for large enterprises, labor productivity declined from P227,000 to P211,000.

**Table 8. Labor Productivity, 1994, 1998, 2003 and 2006**

Year	1994		1998		2003		2006*	
	SMEs	Large	SMEs	Large	SMEs	Large	SMEs	Large
Labor Productivity In million pesos at 1985 prices	0.11	0.196	0.139	0.227	0.097	0.211	0.064	0.118

*Note:* 2006 Data covered only the formal sector of the economy.

In general, the labor productivity of SMEs has remained at only about half that of large enterprises. Some narrowing of the gap was evident in 2003 although SMEs continue to suffer from low productivity. According to the World Bank (2004), the value added per worker relative to all firms was approximately 46% in the Philippines as compared to 64% in Indonesia, 65% in Malaysia and 84% in Thailand.

## **2.2 Constraints to Growth and Development: Survey of Philippine Literature**

Philippine SME studies have continued to highlight the same major constraints that affect SME development everywhere such as access to finance, technology and skills along with information gaps and difficulties with product quality and marketing (FINEX and ACERD; Tecson, 2004; Fukumoto, 2004). These studies show that lack of access to financing is the most significant constraint to SME growth. As the FINEX and ACERD Study argued, the problem seems to lie not in the supply of funds potentially available for SME lending but in the difficulty of access to these funds. In theory, there should be sufficient funds for SME financing since banks are required by law to allocate 8 percent of their loan portfolios to SME financing. At the same time, government financial institutions have their own SME financing programs. Nevertheless, private banks are reluctant to lend to SMEs because of their general aversion to dealing with a larger number of smaller accounts. Moreover, many banks are still unfamiliar with lending to small businesses. Many SMEs cannot access available funds due to their limited track record, limited acceptable collateral and inadequate financial statements and business plans. Based on a survey of MSMEs, Tecson (2004) noted that SMEs complained that banks still considered their projects bankability rather than viability leading them to rely on collateral lending.

Banks appear to be generally complying with the mandatory lending to SMEs with the total compliance rate reaching almost 29 percent in 2002. However, anecdotal evidence shows that much of these funds do not actually go to SMEs but to large firms that deliberately understate their assets in order to be classified as medium enterprises. According to the FINEX and ACERD study, these loan funds, particularly from large banks and financial institutions, hardly benefited small firms at all. On the other hand, much of the funds from government-sponsored lending programs are directed not to real SMEs but more toward livelihood and micro-enterprise projects, many of which fail to grow.

The country's underdeveloped financial markets represent a formidable barrier not just to the entry of new enterprises but also to the growth prospects of small and medium-sized firms. The absence of an extensive, liquid peso financial market contributes to the high cost of investment and makes it more difficult for enterprises to expand. It should be noted, however, that financing constraints do not affect all firms equally, with access to financial credit being a particular problem affecting SMEs (Maxwell Stamp PLC, 2001). Based on a survey of SMEs, Hapitan (2005) concluded that SMEs still face difficulties in credit access, particularly from foreign banks. This, the study found, is the result of accessibility problems in terms of branch location and the absence of information on the availability of credit facilities.

It should also be noted that the experience of Philippines Planters Development Bank, a private bank geared towards SMEs, shows that these challenges can be overcome (Aldaba 2008). In lending to SMEs, Planters went beyond banking by providing non-financial services to help its SME clients strengthen their operations which included assistance in preparing accounting records, business advice and networking. Planters customized and designed its products and services to suit the needs of SMEs. It simplified its loan documentation procedures and customized loans to match borrowers' cash flow.

Many firms lack technological know-how with most SMEs employing poor or low levels of technology. Most small enterprises are labor-intensive, while medium-sized ones are relatively more technology-intensive. With low levels of technology, the production methods are generally inefficient which leads to inconsistent product quality,

low levels of productivity and lack of competitiveness. This is also manifested in high materials wastage, high rates of reworks and an inability to meet deadlines.

The issue of product quality and quality assurance of raw materials would be better addressed if more firms followed certified methods and underwent performance or quality testing. However, there is a lack of common support facilities like testing centers and standardization agencies, whether government or private-sector led. With respect to quality management systems standards such as the ISO series, SMEs do not invest in these business standards due to the high costs involved along with the high degree of formalization and documentation required.

SMEs are also confronted with supply chain management problems from the sourcing of their raw materials to problems in processing, packaging and distribution. They also find it hard and more costly to access raw materials and inputs primarily due to the universal problem of sourcing and transporting raw materials which can be attributed to infrastructure and communication problems. Government tariff policy also raises the costs of their key intermediate inputs.

Tecson (2004) identified other barriers to SME growth such as difficulties in registering their businesses along with Customs practices, particularly, long delays in the clearing of imports and in registering. Tecson also suggested that MSMEs could benefit from better flow of information. Fukumoto (2004) added that most SMEs in the Philippines suffer from a lack of skilled labor, limited market access, a lack of information about market opportunities and insufficient technical training. These constraints together with a lack of adequate financial sources explain why SMEs in the country have low levels of productivity and why their performance has not been vigorous enough to boost the manufacturing industry in particular and the economy in general.

### **3. SME Participation in Production Networks: Experiences of the Philippine Auto, Electronics and Garment Industries**

Due to the rise in globalization and economic integration, a new form of industrial organization, known as international or regional production networks, has emerged. In order to become more efficient, multinational corporations (MNCs) fragment their production process generally by separating the capital-intensive segments from the labor-intensive ones with the latter being transferred to developing countries. MNCs have established these production networks with domestic firms, particularly small and medium enterprises, serving as potential suppliers of outsourced parts or services. This phenomenon is characterized by the export of parts, components, capital equipment and other industrial inputs to be assembled into finished goods for export to the outside world. By fragmenting the multinationals' production processes into different sub-processes located in different economies based on comparative advantage, Kawai (2004) notes that these production networks have promoted the specialization of production in East Asia.

Participation in regional/ global production networks provides domestic firms not only access to export markets but to newer technologies as well. To increase their overall competitiveness in international markets, leading multinational firms provide their local affiliates and local suppliers with more rapid technological upgrading and greater attention to quality control, cost control and human resource development. All these factors can generate substantial positive spillovers and externalities.

Global/ regional production networks have increasingly grown in sectors such as automotive, machinery, electronics and garments. One of the major objectives of the ASEAN Economic Community (AEC) is to deepen economic integration among the ASEAN Member Countries through the establishment of a region-wide production base. Regional production networks, which are at the heart of intra-regional trade and investment flows, are the key drivers of economic growth in ASEAN together with its integration with the East Asian region.

### 3.1. Auto

In the Philippines, affiliates of Japanese automakers Toyota, Mitsubishi, Honda and Isuzu as well as the American firm, Ford, have established their presence in the domestic market. Only Ford has made the country an export platform for its passenger cars. Toyota<sup>2</sup>, on the other hand has designated the Philippines as its manual transmission export hub. Auto parts such as wiring harnesses and transmissions are among the country's major exports. Auto part exports are made by large MNCs like Toyota Auto Parts, Fujitsu Ten, Yazaki, IWS (Sumitomo Electric), PAC (Denso), AFC (Aichi Steel), JECO, TRP (Tokai Rika), HKR and Technol Eight. However, backward linkages are limited because these exports are labor-intensive and highly import-dependent. The link of MNCs to the domestic economy is limited and thus, the value added of these exports is low.

The parts and components segment of the automotive industry is composed of 256<sup>3</sup> companies producing around 330 different parts and components made of metals, plastic, rubber and composite materials for both the original equipment manufacturers (OEM) and replacement markets. Of the 256 automotive parts manufacturers, 124 are considered first-tier manufacturers directly supplying the needs of domestic automotive assemblers. The remaining 132 are mostly small and medium enterprises (SMEs) serving as second and third tier sub-contractors who supply the needs of the first-tier manufacturers.

The bulk of the parts and components industry is composed of small firms with capitalization ranging from P0.5 to P5 million. Most of these firms operate as “mom-and-pop” style suppliers with varying capabilities and some significant quality problems. These firms have failed to develop as they do not possess the necessary capital or technological know-how required to improve their products. Large firms with capitalization of more than P100 million account for only about seven percent of the industry. They comprise the major players in the industry and are the same

---

<sup>2</sup> Under Toyota's Innovative Multi-Purpose Vehicle (IMV) Project, Toyota upgraded and expanded plants in Thailand (Toyota Motor Thailand or TMT), Indonesia (PT Toyota Motor Manufacturing Indonesia or TMMIN), Argentina and South Africa and turned them into assembly and export bases for a line of innovative IMVs.

<sup>3</sup> Recently, the automotive parts industry announced that this was already reduced to only 131 firms.

companies manufacturing parts for OEM car assemblers and engaged in exporting activities.<sup>4</sup>

The linkage between the automotive assembly sector and local parts and components has remained weak. After almost three decades of import substitution which has been centred on local content policy, a large portion of the parts and components industry still remains underdeveloped. At best, the local content program has had only a limited impact on the growth and development of the parts and components industry. Very few parts and components are locally sourced with the domestic parts sector accounting for only 10 to 15 percent of the total number of parts and components required by local motor vehicle assemblers. In contrast, the Thai auto industry sources close to 85-90 percent of its parts domestically. Studies have cited the following reasons to explain why the government's local content program has failed to develop the parts manufacturing sector as a world-class export sector: (i) lack of locally manufactured raw materials, hence many of the raw materials used by components manufacturers are imported; (ii) low productivity and lack of quality measures among small and medium parts makers; (iii) outdated equipment and technology, many manufacturers are using technologies that are more than 20 years out-of-date; and (iv) lack of mold design technology and tool and die making equipment.

To improve the competitiveness of suppliers of parts and other inputs, multinational affiliates together with the government are pursuing programs to develop the creation of backward linkages between their companies and domestic suppliers. In the automotive industry, an attempt to enhance the productivity of local auto parts suppliers is being made through a public-private program called ECOP-Big Enterprise Small Enterprise (EBESE). Toyota Motors Philippines is the most active participating company. EBESSE

---

<sup>4</sup> The major players in the automotive components manufacturing sector are Yazaki-Torres Manufacturing Corp., United Technologies Automotive Phils., Temic Automotive (Phils.) Inc., Honda Engine Manufacturing Phils., Inc., Asian Transmission Corp., Toyota Autoparts Phils., Fujitsu Ten Corp. of the Phils. and Aichi Forging Co., Inc.. Other manufacturers with a proven track record in both OEM and replacement markets include International Wiring Systems Corp.; Honda Parts Manufacturing Corp., Isuzu Auto Parts Manufacturing Corp., Philippine Aluminum Wheels Inc., Enkei Phils. Inc., Kosei Inc., Roberts Automotive & Industrial Parts Manufacturing Corp., Goodyear Phils., Inc and Ohtsuka Poly-Tech Phils., Inc.



is a partnership among the Employers' Confederation of the Philippines (ECOP), Department of Science & Technology (DOST) and Department of Trade & Industry (DTI).

### **3.2. Electronics**

Production networks are also found in the machinery, electrical goods and electronic parts and components industries. Electronics comprise the bulk of total exports with an average share of 65 percent in the 2000s. Like the auto parts industry, this sector is confronted with the same problem of limited backward linkages. There are 865 electronics companies in the country, 72 percent are MNCs. These are located in special economic zones. A critical mass has been created through the presence of large American, European, Japanese, Korean and Taiwanese companies like Intel<sup>5</sup>, Texas Instruments, Philips, Sony, Toshiba, Hitachi, Fujitsu, Samsung, Goldstar and Acer.

The industry's exports are mainly concentrated in semiconductor assembly, packaging and testing (APT). From the viewpoint of participation in the electronics industry value added chain, the Philippines operates in a very narrow range. Agarwalla (2005) estimated the country's participation to be less than 15%. Apart from APT, the industry participates peripherally in printed circuit board assembly and enclosures (plastics, sheet, metal, etc). This narrow participation leaves the country vulnerable to dwindling participation in the global electronics industry and stagnation, even in the semiconductor APT. It also limits the opportunities for spillovers into the local economy. Unless the country participates in other segments of the value chain, it would be difficult for us to anticipate a significant increase in its profitable participation in the global electronics industry.

Studies have shown that the country's participation in the global production network has hardly progressed beyond the lowest level of the production chain (Austria 2006a). Agarwalla indicated that major parts of the electronics supply chain do not reside in the Philippines and unless technology is developed in the country that makes it commercially viable to bring these elements of production to the Philippines, they will

---

<sup>5</sup> In line with the restructuring of its manufacturing operations, Intel announced in 2008 the pull-out of its Philippine and Malaysian assembly test facilities along with the closure of some US plants.

continue to remain outside the country or locate to China, the most competitive country in the region.

Given the limited role of Philippine electronics in the labor-intensive assembly and testing segment of the production process, our electronics exports have been import dependent with minimal domestic value added. Austria (2006a) noted that backward linkages in the electronics industry remain weak because of both the small numbers and immaturity of local suppliers. Santiago (2005) attributed this to the following problems: unavailability of raw materials, difficulty of finding local suppliers, unreliability of local suppliers, high cost of local raw materials, failure to meet required quality standards. Faced with these constraints, MNCs are forced to import their intermediate inputs. This is illustrated by the case of Wistron Infocomm, a manufacturer of motherboards and computer notebooks for export. Located at the Subic Bay Industrial Park, the excellent infrastructure of which attracted Wistron's suppliers in Taiwan to follow its lead and relocate to Subic. The foreign suppliers tried to establish linkage through outsourcing with local suppliers. However, minimal linkages were created due to the poor quality of output and high costs of local outsourcing (Austria 2006b). Agarwalla pointed out that in many instances; the multinational companies that could increase their local purchases were restricted by their headquarters because the parent company had a global buying program requiring them to import from certified global suppliers even those items available locally. To address this, local suppliers are positioning themselves to become global suppliers of these MNCs. However, the process of being approved as a global supplier is time-consuming and costly.

Trade fairs are held to provide opportunities for networking and linkage development. Reverse trade fairs are organized to encourage domestic companies to engage in the manufacture of parts and components. The industry association known as the Semi-conductor and Electronic Industry of the Philippines, Inc. (SEIPI) maintains a database on suppliers to its member firms. SEIPI has also set up a “Center for Excellence” – the Advanced Research and Competency Development Institute offering advanced training for electronics employees.

### 3.3. Garments

The garment industry has been dominated by the assembly<sup>6</sup> portion of the production system with relatively few firms like Luen Thai, Eastland and Fil-Pacific providing full package supply or OEM (Antonio and Rodolfo 2006). Basically, the industry is part of what is known as Triangle Manufacturing (Gereffi 2002), whereby a foreign buyer deals with an agent in a newly industrialized economy which then outsources production in the Philippines. The triangle is completed once the Philippine supplier ships the products to the buyer. In recent years, however, mass retailers have shifted from the Philippines to low labor-cost countries such as Cambodia, Sri Lanka, China and Vietnam. Within this highly competitive environment, moving up the value chain and working towards becoming OEM and OBM by enhancing its capabilities is crucial for the industry. To do this, Antonio and Rodolfo (2005) identified the major constraints that need to be addressed: (i) high cost of labor and power; (ii) slow productivity growth due to lack (decline) of investments; (iii) lack of ICT applications; (iv) lack of locally sourced quality raw materials and dependency on imported raw materials which leads to longer lead times; and (v) lack of design capabilities and minimal linkages between local designers and manufacturers.

The Philippines does not have an integrated textile industry that can support the requirements of the garment industry. In the absence of such an industry, textile millers in the Philippines also face difficulties sourcing their raw materials, importing about 80 percent of their input requirements such as polyester fiber, cotton, rayon and acrylic. Given the negative impact of the absence of high quality domestic textiles on the competitiveness of garments, some garment firms have linked up with local yarn and textile producers and are now sourcing 10-20 percent of their requirements locally. Such clustering allows textile producers to niche and upgrade their capabilities.

---

<sup>6</sup> The assembly system is one of industrial subcontracting in which manufacturers provide the parts for simple assembly to garment sewing factories. The OEM system represents commercial subcontracting where the buyer-seller linkage between foreign merchants and domestic manufacturers allows for a greater degree of local learning on the upstream and downstream segments of the garment chain.

## **4. SME Survey of Manufacturing Firms**

Previous studies on Philippine SMEs have provided many useful insights into understanding the barriers and constraints faced by SMEs. In summary, the most notable constraints identified include those related to financing and technology (see discussions above). While most SMEs face similar constraints, their relative importance and impacts vary because of the wide heterogeneity of SMEs. How and why these barriers and constraints differ are relevant questions to be asked when drafting effective policies to encourage SME development.

In particular, this study aims to look at the differences, if any, between firms within and outside an IPN, in line with the objective of strengthening and increasing their participation in regional production networks. To this end, the study has conducted a survey of SME firms to provide a more concrete picture of the constraints from their perspective. In the first place, to what extent is SME participation happening? For those able to be part of the IPNs, how do they differ from other SMEs in terms of performance, the barriers they face and assistance required and received?

### **4.1. Survey Administration and Design**

The study carried out a firm survey to obtain insights and gain better understanding of the differences in the characteristics and perceptions of firms operating within and outside IPNs. The survey identified not only the barriers to growth faced by the firms but also examined government assistance programs from the perspective of the firms. The survey was carried out by the Philippine National Statistics Office (NSO) from November to December 2009 on manufacturing firms operating in the National Capital Region. Under a systematic sampling design, samples were drawn from the NSO's 2008 List of Establishments (LE) with manufacturing establishments as the unit of analysis and middle managers as respondents. The NSO distributed the questionnaire to a total of 150 firms: 46 from the garment sector, 34 from electronics, 33 from transport parts and components (mostly auto sector) and 37 from other sectors (mostly food manufacturing). A total of 101 manufacturing firms, representing a response rate of 67%, participated in the survey.

#### 4.2. Major Characteristics of Respondents: IPN vs. Non-IPN Firms

Table 9 presents the distribution of the sample-surveyed firms by type of industry and employment size. 28% of the sample firms are from the electronics sector, 26% from garments, 23% from transport parts and components and the remaining 24% are from other sectors dominated by food manufacturing and processing. In terms of size, almost 60% of the firms have employment figures ranging from 1 to 5 workers while 25% employ from 6 to 49 workers. Only 15% represent firms employing from 50 to 99 workers.

Table 10a shows that of the total of 101 firms, only 14 are IPN participants. This figure alone gives an indication of the low participation rate of Philippine SMEs in IPNs. The majority of these firms (86%) employ from 1 to 50 workers. More than 80% of the firms are in the electronics and transport parts and components industries. For the remaining 87 firms that operate outside IPNs, 84% also fall within the same employment size (1-50 workers). The non-IPN firms are distributed as follows: 30% in garments, 25% in electronics, 20% parts and components and 25% in other sectors. Comparing their mean employment, IPN firms have a considerably higher mean average of 59 workers than non-IPN firms with 48 workers (Table 10b).

**Table 9. Sample of Surveyed Firms by Industry and Size**

Industry	Number of Employees				Total
	1-5	6-49	50-99	100-199	
Garment	14	5	7	0	26
	23.33	20	46.67	0	25.74
Transport Parts, Components	14	8	1	0	23
	23.33	32	6.67	0	22.77
Electronics	18	4	5	1	28
	30	16	33.33	100	27.72
Others	14	8	2	0	24
	23.33	32	13.33	0	23.76
Total	60	25	15	1	101
	100	100	100	100	100

**Table 10a. Sample of Surveyed Firms by Production Network**

Industry	Non-IPN Firms					IPN Firms				
	Number of Employees					Number of Employees				
	1-5	6-49	50-99	100-199	Total	1-5	6-49	50-99	100-199	Total
Garment	14	5	7	0	26	0	0	0	0	0
Transport Parts & Components	11	5	1	0	17	3	3	0	0	6
Electronics	16	2	3	1	22	2	2	2	0	6
Others	13	7	2	0	22	1	1	0	0	2
Total	54	19	13	1	87	6	6	2	0	14

**Table 10b. Employment by Production Network**

Summary Statistics	Non-IPN	IPN	Total
Mean	47.64368	59.14286	49.23762
SD	46.4928	40.30243	45.67344
Min	3	5	3
Max	216	144	216

Relatively little difference is noted between IPN and non-IPN firms in terms of age. The majority of the surveyed firms have been operating for more than 15 years (see Table 11). Approximately 57% of the IPN firms fall within this age range, while for the non-IPN firms, the ratio is 61%. The mean age for both groups is almost the same (around 21 years).

**Table 11. Firm Age by Production Network**

Firm Age	Non-IPN	IPN	Total
0<Age<=5	11 12.94	1 7.14	12 12.12
5<Age<=15	22 25.88	5 35.71	27 27.27
Age>15	52 61.18	8 57.14	60 60.61
Total	85 100	14 100	99 100
Mean	21.47126	20.85714	21.38614
SD	14.4567	12.91307	14.19364
Min	0	5	0
Max	55	47	55

The same is true in terms of nationality of ownership. In terms of ownership, the surveyed firms are mostly 100% domestically-owned firms (see Table 12). Around 79% of IPN firms are 100% Filipino-owned. The same figure is obtained for non-IPN firms. Joint ventures represent a relatively small proportion of the total for each group, 21% for IPN firms and 18% for non-IPN firms. The mean foreign equity participation is the same, at about 10% each for IPN and non-IPN firms (Table 13).

**Table 12. Ownership**

Ownership	Non-IPN	IPN	Total
Domestic	69 79.31	11 78.57	80 79.21
Foreign	2 2.3	0 0	2 1.98
Joint Venture	16 18.39	3 21.43	19 18.81
Total	87 100	14 100	101 100

**Table 13. Foreign Ownership**

Foreign Ownership	Non-IPN	IPN	Total
0<For<=0.2	4 22.22	1 33.33	5 23.81
0.2<For<=0.5	7 38.89	0 0	7 33.33
0.5<For<=0.8	3 16.67	1 33.33	4 19.05
For>0.8	4 22.22	1 33.33	5 23.81
Total	18 100	3 100	21 100
Mean	0.0968161	0.1142857	0.0992376
SD	0.2372578	0.2730093	0.2411155
Min	0	0	0
Max	1	0.9	1

A difference is noted in the export orientation between IPN and non-IPN firms. Table 14 shows that among the surveyed IPN firms, only 29% are exporters. Among non-IPN firms, the ratio is lower at around 21%. However, IPN firms have mean exported output of 23% while for exporting non-IPN firms, the mean is considerably higher at 61% (Table 15). This is mainly because IPN firms do not export directly since they are suppliers of parts and other intermediate inputs to assemblers and other levels or tiers in the overall production chain. In terms of skill intensity, the mean is higher for non-IPN firms (55%) than for IPN firms (50%).

**Table 14. SME Participation in Export**

Indicator	Non-IPN	IPN	Total
Does not export	69 79.31	10 71.43	79 78.22
Export	18 20.69	4 28.57	22 21.78
Total	87 100	14 100	101 100

**Table 15. Exported Output**

Exported Output	Non-IPN	IPN	Total
0<Exp>=0.2	2 11.11	2 50	4 18.18
0.2<Exp>=0.5	8 44.44	2 50	10 45.45
0.5<Exp>=1	8 44.44	0 0	8 36.36
Total	18	4	22
Mean	0.6063889	0.225	0.5370455
SD	0.3852799	0.1908752	0.3847592
Min	0.01	0.07	0.01
Max	1	0.5	1

**Table 16. Skill Intensity**

Skill Intensity	Non-IPN	IPN	Total
0<SI>=0.25	17 19.54	3 21.43	20 19.8
0.25<SI>=0.5	25 28.74	5 35.71	30 29.7
0.5<SI>=0.75	14 16.09	1 7.14	15 14.85
75<SI<=1	31 35.63	5 35.71	36 35.64
Total	87 100	14 100	101 100
Mean	0.55	0.5012857	0.5432475
Std. Dev.	0.3312311	0.3419856	0.3314276
Min	0	0	0
Max	1	0.9861	1

### 4.3. Overall Economic Performance

On the whole, among the surveyed firms, IPN firms performed better in terms of growth. Table 17 shows that among these firms, close to 36% posted growth of over 23% while among non-IPN firms, the ratio is only about 24%. 34% of non-IPN firms registered growth of less than or equal to -0.6%. For IPN firms, the ratio is lower at 21%. Mean growth for IPN firms is about 80% and 31% for non-IPN firms.



**Table 17. Growth**

Growth Rate	Non-IPN	IPN	Total
gr<=-0.56%	30 34.48	3 21.43	33 32.67
0.56%<gr<=9.2%	18 20.69	4 28.57	22 21.78
9.2%<gr<=22.7%	18 20.69	2 14.29	20 19.8
gr>22.7%	21 24.14	5 35.71	26 25.74
Total	87 100	14 100	101 100
Mean	0.3070348	0.8003483	0.3754149
SD	1.403326	2.638232	1.62105
Min	-0.975498	-0.6666653	-0.975498
Max	11.85167	9.902445	11.85167

In terms of profitability, however, no difference is noted. Table 18 indicates that in terms of profitability, both groups registered a similar mean rate with 14% for IPN firms and 13% for non-IPN firms. About 69% of IPN firms have profit rates that are less than or equal to 10%. 54% of non-IPN firms fall within the same range.

**Table 18. Profitability Rate**

Profit Rate	Non-IPN	IPN	Total
profit<=3%	25 31.65	4 30.77	29 31.52
3%<profit<=10%	18 22.78	5 38.46	23 25
10%<profit<=19.3%	16 20.25	1 7.69	17 18.48
profit>19.3%	20 25.32	3 23.08	23 25
Total	79 100	13 100	92 100
Mean	0.1292361	0.1357385	0.1301549
SD	0.1364587	0.2259144	0.1506526
Min	0.0003	0.00745	0.0003
Max	0.65	0.85	0.85

Some difference is observed in terms of labor productivity, with IPN firms performing better than expected. Labor productivity, here, is measured by sales per worker. Among the surveyed firms, the mean is about US\$49,700 for IPN firms and US\$34,940 for non-IPN firms (Table 19). Around 43% of IPN firms have labor productivity ranging from US\$8,890 to \$23,780 and 28% for non-IPN firms. About 30% of non-IPN firms have labor productivity above US\$23,780. For IPN firms, the ratio is about 36%.

**Table 19. Labor Productivity (in US\$000)**

Labor Productivity	Non-IPN	IPN	Total
0<LP>=3.74	16 18.39	2 14.29	18 17.82
3.74<LP>=8.89	17 19.54	1 7.14	18 17.82
8.89<LP<=23.78	24 27.59	6 42.86	30 29.7
LP>23.78	30 34.48	5 35.71	35 34.65
Total	87 100	14 100	101 100
Mean	34.93739	49.70086	36.98381
SD	69.30064	108.008	75.31963
Min	0.15855	2.512526	0.15855
Max	501.9268	420.6879	501.9268

#### 4.4 Financing

IPN firms appear to have enjoyed preferential borrowing terms. Table 20 shows that on average, IPN firms pay much lower interest rates on their borrowings with 43% reporting interest rates of lower than 8%. Only 22% of non-IPN firms face the same interest rates with 33% paying rates greater than 12%. Mean interest rates for IPN firms are about 8% and 13% for non-IPN firms.

**Table 20. Interest Rates on SME Borrowings**

Interest Rate	Non-IPN	IPN	Total
IR<=8%	6 22.22	3 42.86	9 26.47
8<IR>=12%	12 44.44	3 42.86	15 44.12
IR>12%	9 33.33	1 14.29	10 29.41
Total	27 100	7 100	34 100
Mean	0.1304667	0.0823857	0.1205676
SD	0.0736863	0.0787115	0.076117
Min	0.0001	0.0004	0.0001
Max	0.36	0.24	0.36

Table 21 indicates that mean share of interest payments to total cost is also much lower for IPN firms at 3% while for non-IPN firms, the mean is about 8%. The share of interest payments to total cost for most IPN firms ranges from one to 5%. For non-IPN firms, the majority have a share greater than 5%.

**Table 21. Share of Interest Payments in Total Cost**

Interest share	Non-IPN	IPN	Total
Intsh≤1	5	2	7
	16.67	28.57	18.92
1<Intsh≤5	8	3	11
	26.67	42.86	29.73
Intsh>5	17	2	19
	56.67	28.57	51.35
Total	30	7	37
	100	100	100
Mean	0.081195	0.0349071	0.0724378
SD	0.0841001	0.0215601	0.0781845
Min	0.0007	0.00525	0.0007
Max	0.3	0.06	0.3

Interest coverage ratio is higher for IPN firms, 50% of the firms have ratios greater than 71.4 and only 22% for non-IPN firms (Table 22). The mean interest coverage ratio is 105 for IPN firms and 95 for non-IPN firms.

**Table 22. Interest Coverage Ration**

ICR	Non-IPN	IPN	Total
ICR≤11.5	7	0	7
	25.93	0	21.21
11.5<ICR≤24.8	7	0	7
	25.93	0	21.21
24.8<ICR≤71.4	7	3	10
	25.93	50	30.3
ICR>71.4	6	3	9
	22.22	50	27.27
Total	27	6	33
	100	100	100
Mean	95.2369	104.9054	96.99481
SD	272.1578	95.38261	248.2291
Min	4.806537	25.30103	4.806537
Max	1436.183	233.9918	1436.183

Table 23 shows that all IPN firms rely on their retained earnings to finance their working capital. Retained earnings registered a mean of 76% for IPN firms. For non-IPN firms, financing sources for working capital vary, with 67% of the firms also relying on their retained earnings. 15% of non-IPN firms rely on banks for their working capital while 17% rely on other sources. For non-IPN firms, retained earnings registered a mean of 56%.

**Table 23. Working Capital Financing Sources**

Sources	Non-IPN	IPN	Total
Retained Earnings	48	12	60
	66.67	100	71.43
Banks	11	0	11
	15.28	0	13.1
Other Financial Institutions	1	0	1
	1.39	0	1.19
Others	12	0	12
	16.67	0	14.29
Total	72	12	84
	100	100	100

**Table 23a. From Retained Earnings**

	Non-IPN	IPN	Total
less than 25%	31	1	32
	35.63	7.14	31.68
25% to 50%	6	1	7
	6.9	7.14	6.93
50% to 75%	7	4	11
	8.05	28.57	10.89
75% to 100%	43	8	51
	49.43	57.14	50.5
Total	87	14	101
	100	100	100
Mean	0.5638322	0.763	0.5914396
SD	0.4294188	0.2719231	0.4159094
Min	0	0.09	0
Max	1	1	1

**Table 23b. From Banks**

	Non-IPN	IPN	Total
zero	62	7	69
	71.26	50	68.32
less than 40%	13	6	19
	14.94	42.86	18.81
40% to 80%	5	1	6
	5.75	7.14	5.94
80% to 100%	7	0	7
	8.05	0	6.93
Total	87	14	101
	100	100	100
Mean	0.1331954	0.1179214	0.1310782
SD	0.2746396	0.1493771	0.2603767
Min	0	0	0
Max	1	0.4639	1

**Table 23c. From Other Financial Institutions**

	Non-IPN	IPN	Total
zero	80	14	94
	91.95	100	93.07
less than 50%	6	0	6
	6.9	0	5.94
more than 50%	1	0	1
	1.15	0	0.99
Total	87	14	101
	100	100	100
Mean	0.0230345	0	0.0198416
SD	0.1075766	0	0.1000826
Min	0	0	0
Max	0.804	0	0.804

**Table 23d. From Other Sources**

	Non-IPN	IPN	Total
zero	53	9	62
	60.92	64.29	61.39
less than 50%	21	5	26
	24.14	35.71	25.74
50% to 100%	13	0	13
	14.94	0	12.87
Total	87	14	101
	100	100	100
Mean	0.1876161	0.1119357	0.1771257
SD	0.3233417	0.1843399	0.308255
Min	0	0	0
Max	1	0.4461	1

For capital expansion, 75% of IPN firms rely on retained earnings while the remaining 25% rely on other sources. For non-IPN firms, 47% rely on other sources, 29% on retained earnings and 24% on banks.

**Table 24. Capital Expansion Financing Sources**

	Non-IPN	IPN	Total
Retained Earnings	5	3	8
	29.41	75	38.1
Bank	4	0	4
	23.53	0	19.05
Other Financial Institutions	0	0	0
Other Sources	8	1	9
	47.06	25	42.86
Total	17	4	21
	100	100	100

**Table 24a. From Retained Earnings**

	Non-IPN	IPN	Total
zero	76	10	86
	87.36	71.43	85.15
less than 50%	6	1	7
	6.9	7.14	6.93
50 to 100%	5	3	8
	5.75	21.43	7.92
Total	87	14	101
	100	100	100
Mean	0.0665977	0.2028571	0.0854851
SD	0.2189926	0.3824703	0.2499991
Min	0	0	0
Max	1	1	1

**Table 24b. From Banks**

	Non-IPN	IPN	Total
zero	79	12	91
	90.8	85.71	90.1
less than 50%	3	2	5
	3.45	14.29	4.95
50 to 100%	5	0	5
	5.75	0	4.95
Total	87	14	101
	100	100	100
Mean	0.0451724	0.045	0.0451485
SD	0.1618703	0.1145392	0.1556895
Min	0	0	0
Max	0.8	0.33	0.8

**Table 24c. From Other Financial Institutions**

	Non-IPN	IPN	Total
zero	85	14	99
	97.7	100	98.02
less than 50%	2	0	2
	2.3	0	1.98
Total	87	14	101
	100	100	100
Mean	0.0028736	0	0.0024752
SD	0.0220416	0	0.0204649
Min	0	0	0
Max	0.2	0	0.2

**Table 24d. From Other Sources**

	Non-IPN	IPN	Total
zero	74	13	87
	85.06	92.86	86.14
less than 50%	5	0	5
	5.75	0	4.95
50 to 100%	8	1	9
	9.2	7.14	8.91
Total	87	14	101
	100	100	100
Mean	0.1029425	0.05	0.095604
SD	0.2831177	0.1870829	0.2717018
Min	0	0	0
Max	1	0.7	1

#### 4.5 Location of Plants, Travel Time and Distance from Major Ports

None of the surveyed firms are located within industrial parks or economic zones. However, most are located within five kilometers of EPZs or industrial parks. Most of the firms are located in proximity to major seaports and airports. Mean distance from ports is about 11.4 kilometers for IPN firms and 12.8 kilometers for non-IPN firms. In terms of hours, mean distance from ports is about 2 hours for IPN firms and 1.5 hours for non-IPN firms. Most IPN firms are located within 10 to 20 kilometers of main ports while non-IPN firms are within 2 to 10 kilometers of main ports. In terms of number of hours, most IPN and non-IPN firms are 1 to 2 hours away from main ports.

**Table25a. Distance from Main Port (range in km)**

	Non-IPN	IPN	Total
2<dist<=10	40	4	44
	47.06	30.77	44.9
10<dist<=20	26	8	34
	30.59	61.54	34.69
20<dist<=40	16	1	17
	18.82	7.69	17.35
40<dist<=50	3	0	3
	3.53	0	3.06
Total	85	13	98
	100	100	100
Mean	12.77294	11.38462	12.58878
SD	9.47183	4.444818	8.964373
Min	2	6	2
Max	50	20	50

**Table 25b. Distance from Main Port (range in hours)**

	Non-IPN	IPN	Total
0.2<dist<1	12	0	12
	14.12	0	12.24
1<=dist<=2	40	7	47
	47.06	53.85	47.96
2 <dist<=3	25	3	28
	29.41	23.08	28.57
3<dist<=6	8	3	11
	9.41	23.07	11.22
Total	85	13	98
	100	100	100
Mean	1.527059	1.961538	1.584694
SD	0.7319882	1.450022	0.863743
Min	0.2	1	0.2
Max	3	6	6

**Table 25c. Distance from EPZ or Industrial Parks (range in km)**

	Non-IPN	IPN	Total
dist<=5km	37	6	43
	48.68	46.15	48.31
5<dist<=10	12	5	17
	15.79	38.46	19.1
10<dist<=25	11	1	12
	14.47	7.69	13.48
dist>25	16	1	17
	21.05	7.69	19.1
Total	76	13	89
	100	100	100
Mean	14	9.461538	13.33708
Std. Dev	16.103	8.637278	15.28959
Min	0	1	0
Max	85	34	85



**Table 25d. Distance from EPZ or Industrial Park (range in hours)**

oepzh1	Non-IPN	IPN	Total
dist<=1 hr	36 49.32	6 46.15	42 48.84
1<dist<=2	21 28.77	6 46.15	27 31.4
dist>2	16 21.92	1 7.69	17 19.77
Total	73 100	13 100	86 100
Mean	1.59726	1.361538	1.561628
Std. Dev	1.054616	0.8150035	1.021322
Min	0.2	0.3	0.2
Max	4	3	4

#### 4.6. Business Improvement Initiatives and Innovative Efforts

IPN firms, among the firms surveyed, appeared to fare better in terms of business improvement initiatives and innovative efforts. Among IPN firms, 29% met an international standard (like ISO), 50% introduced ICT and reorganized their business processes accordingly, 7% established new divisions and 50% are engaged in networking with industry associations. 36% of the IPN respondents bought new machines or facilities, 50% upgraded their existing machinery and equipment and 14% introduced new production methods. Around 36% of the respondents indicated that they introduced new products in the last three years, of which 40% reported that these were introduced to the existing market and 40% used their existing technology.

For non-IPN firms, 33% met an international standard, 38% introduced ICT, 9% established new divisions and 46% are engaged in networking with industry associations. 30% acquired new machines or facilities, 37% improved their existing machinery and equipment and only 8% introduced new production methods. Around 40% of the respondents said that they introduced new products in the last three years, of which 17% introduced these new products to the existing market and 23% reported that they used their existing technology.

**Table 26a. International Standards**

Indicator	Non-IPN	IPN	Total
Has not met international standards	58	10	68
	66.67	71.43	67.33
Has met international standards	29	4	33
	33.33	28.57	32.67
Total	87	14	101
	100	100	100

**Table 26b. ICT**

Indicator	Non-IPN	IPN	Total
Has not introduced ICT	54	7	61
	62.07	50	60.4
Has introduced ICT	33	7	40
	37.93	50	39.6
Total	87	14	101
	100	100	100

**Table 26c. New Divisions**

Indicator	Non-IPN	IPN	Total
Has not established new divisions	79	13	92
	90.8	92.86	91.09
Has established new divisions	8	1	9
	9.2	7.14	8.91
Total	87	14	101
	100	100	100

**Table 26d. Business Associations, R&D, & Other Networks**

Indicator	Non-IPN	IPN	Total
Not involved in business associations, R&D & other networks	47	7	54
	54.02	50	53.47
Involved in business associations, R&D & other networks	40	7	47
	45.98	50	46.53
Total	87	14	101
	100	100	100

**Table 26e. New Machinery & Facilities**

Indicator	Non-IPN	IPN	Total
Has not bought new machinery or facilities	61	9	70
	70.11	64.29	69.31
Bought new machinery or facilities	26	5	31
	29.89	35.71	30.69
Total	87	14	101
	100	100	100

**Table 26f. Existing Machinery & Facilities**

Indicator	Non-IPN	IPN	Total
Has not improved existing machinery & facilities	55	7	62
	63.22	50	61.39
Improved existing machinery & facilities	32	7	39
	36.78	50	38.61
Total	87	14	101
	100	100	100

**Table 26g. New Production Methods**

Indicator	Non-IPN	IPN	Total
Has not introduced new know-how in production method	80	12	92
	91.95	85.71	91.09
Introduced new know-how in production method	7	2	9
	8.05	14.29	8.91
Total	87	14	101
	100	100	100

**Table 26h. New Products or Services**

Indicator	Non-IPN	IPN	Total
Has not introduced new products or services	52	9	61
	59.77	64.29	60.4
Introduced new products or services	35	5	40
	40.23	35.71	39.6
Total	87	14	101
	100	100	100

**Table 26i. New Products or Services in Existing Markets**

Indicator	Non-IPN	IPN	Total
Has not introduced new products in existing markets	29	3	32
	82.86	60	80
Introduced new products in existing markets	6	2	8
	17.14	40	20
Total	35	5	40
	100	100	100

**Table 26j. New Products & Services using New Technology**

Indicator	Non-IPN	IPN	Total
Has not introduced new products using existing technology	27	3	30
	77.14	60	75
Introduced new products using existing technology	8	2	10
	22.86	40	25
Total	35	5	40
	100	100	100

#### **4.7. Assistance Received From Government, NGOs and Others**

The respondents were asked if they received assistance from government, NGOs and other institutions in the form of training in general business management, counseling and advice, market information, technology development and transfer, business linkages and networking, financing and overall improvement in investment climate. Those who answered yes were then asked to evaluate the assistance that they received. Respondents scored the barriers from 1 to 5, with “1” being very adequate to “5” being not at all adequate. Table 27 presents the results for IPN and non-IPN firms. Around 40 % of all firms surveyed indicated that they received at least one form of assistance. The most commonly-cited assistance was in the form of market information, followed by training in general management. Decomposing between IPN and non-IPN firms, 50 % of IPN firms received at least one form of assistance, compared to 40 % for non-IPN firms. For IPN firms, the most cited form is business linkages and networking while for non-IPN firms, it is market information. Based on the perceptions of the surveyed firms, the results indicate that both IPN and non-IPN recipient firms are satisfied with the assistance they received. Among IPN firms, mean responses range from 1.67 to 2.8 and for non-IPN firms mean ratings range from 1.92 to 2.46. The results, however, cannot adequately show whether they receive all the assistance they require, nor to what extent this assistance is adequate to overcome the constraints they face.

**Table 27. Perceptions on Effectiveness of Government Assistance**

SME Group	Assistance Type	N	Mean	SD
Non-IPN	Financing	24	1.91667	1.28255
	Counseling and advice	22	1.95455	1.4953
	Business linkages and networking	23	2.21739	1.44463
	Technology Development and transfer	32	2.25	1.21814
	Overall improvement in investment climate	24	2.33333	1.57885
	Training in general business management	33	2.36364	1.31857
	Market Information	35	2.45714	1.31379
IPN	Training in general business management	6	1.66667	1.0328
	Counseling and advice	4	1.75	1.5
	Financing	5	2	1.41421
	Business linkages and networking	7	2.14286	1.21499
	Market Information	5	2.2	1.30384
	Technology Development and transfer	5	2.8	1.78885
All	Counseling and advice	26	1.92308	1.4676
	Financing	29	1.93103	1.27982
	Business linkages and networking	30	2.2	1.37465
	Overall improvement in investment climate	25	2.24	1.61452
	Training in general business management	39	2.25641	1.29204
	Technology Development and transfer	37	2.32432	1.29216
	Market Information	40	2.425	1.29867

To summarize, on the whole, the SMEs surveyed share some common characteristics, specifically in terms of age, ownership and profitability. The notable differences between IPN and non-IPN firms surveyed are in their growth performance, labor productivity and financing terms, with IPN firms at the favorable end. IPN firms among the firms surveyed also performed better in terms of business improvement initiatives and innovative efforts. Another important finding is the seemingly low IPN participation rate of Philippine SMEs, with only 14% of the surveyed firms qualifying to be within an IPN. This is consistent with the main finding in the literature that SME participation in production networks is limited due to the weak backward linkages in the auto and electronics industries (sub-sections 3.1 and 3.2). The results also confirm the

findings of earlier studies about the limited access of SMEs to financing and technology. The results show that some firms do receive at least one form of assistance, mainly in the form of market information but that it reaches less than half of the firms surveyed.

The first part of the survey provides a comprehensive description of the characteristics of SMEs and reveals some important differences between IPN and non-IPN firms. More can be gleaned about the constraints and barriers by looking at the firms' perceptions of what these are and what kind of assistance they require.

## **5. Analysis of SMEs and Regional Integration**

### **5.1. Constraints to Growth of IPN and Non-IPN Firms**

To gain a deeper understanding of the constraints to SME growth, the survey also asked about the firms' perceptions of the barriers that they confront. The barriers are generally classified into two categories: internal and external. The former pertains to barriers that are internal to the firm and associated with its organizational resources and capabilities. The latter refers to barriers originating from the home and host environment within which the firm operates. Internal barriers cover informational; functional; product and price; and distribution, logistics and promotion. The external barriers include procedural; business environment; and tax, tariff and non-tariff.

The perceived barriers are ranked according to the mean score received. Respondents scored the barriers from 1 to 5, with "1" being most significant to "5" being insignificant. The results are presented in Table 28. For IPN firms, the top 10 most commonly-cited barriers are: difficulties in offering competitive prices to customers; meeting product quality, standards, and specifications; difficulties in establishing and maintaining trust with business partners; developing new products; willingness to adopt new business strategies or ideas; difficulty in getting credit from suppliers and financial institutions; high tax and tariff barriers; inability to identify and contact potential business partners; shortage of working capital to finance new business plan; and poor and deteriorating economic conditions at home.

**Table 28. Perception of Barriers to SME Development**

SME Group	Barrier	Code	N	Mean	SD	Category	General Type
IPN	Offering competitive prices to customers	B14	14	2.357	1.216	product & price	Internal
	Meeting product quality/standards/specifications	B11	14	2.429	1.284	product & price	Internal
	Establishing and maintaining trust with business partners	B19	14	2.429	1.399	distribution, logistics & promotion	Internal
	Developing new products	B9	14	2.571	1.604	product & price	Internal
	Willingness to adopt new business strategy or ideas	B37	14	2.571	1.284	other barriers	External
	Difficulty in getting credit from suppliers and financial institutions	B8	14	2.714	1.069	functional	Internal
	High tax and tariff barriers_HM	B31a	14	2.714	1.326	tax, tariff & non tariff	External
	Inability to identify and contact potential business partners	B3	14	2.786	1.369	informational	Internal
	Shortage of working capital to finance new business plan	B7	14	2.786	1.051	functional	Internal
	Poor/deteriorating economic conditions_HM	B28a	14	2.786	1.424	business environment	External
	Poor/deteriorating economic conditions_FM	B28b	13	2.846	1.345	business environment	External
	Unreliable market data (costs, prices, market shares)	B2	14	2.857	1.460	informational	Internal
	Adapting to demanded product design/style	B10	14	2.857	1.562	product & price	Internal
	Restrictive health, safety and technical standards (e.g., sanitary and phyto sanitary requirements)_HM	B33a	14	2.857	1.460	tax, tariff & non tariff	External
	Political instability_HM	B30a	13	2.923	1.441	business environment	External
	Difficulty in matching competitors' prices	B15	14	2.929	1.269	product & price	Internal
	Lack of managerial time to identify new business opportunities	B4	14	3.000	1.519	functional	Internal
	Complexity of production value chain	B17	14	3.000	1.359	distribution, logistics & promotion	Internal
	Limited Information to locate/ analyze markets/business partners	B1	14	3.071	1.685	informational	Internal
	Insufficient quantity of and/ or untrained personnel for	B5	14	3.071	1.542	functional	Internal

market expansion							
Meeting packaging/labeling requirements	B12	14	3.071	1.492	product & price	Internal	
Participation in promotional activities to target markets/business partners	B22	14	3.071	1.542	distribution, logistics & promotion	Internal	
High costs of Customs administration, in exporting or importing_HM	B34a	14	3.071	1.639	tax, tariff & non tariff	External	
Lack of production capacity to expand	B6	14	3.143	1.231	functional	Internal	
Accessing a new production chain	B18	14	3.143	1.460	distribution, logistics & promotion	Internal	
Unfavourable home rules and regulations	B26	14	3.143	1.657	procedural	External	
Inadequacy of basic and IT infrastructure_HM	B29a	14	3.143	1.406	business environment	External	
Perceived risks in your current and new business operations	B35	14	3.214	1.369	other barriers	External	
Unavailability of inventories/warehousing facilities	B20	14	3.286	1.267	distribution, logistics & promotion	Internal	
Excessive transportation/insurance costs	B21	14	3.286	1.437	distribution, logistics & promotion	Internal	
Difficulties in enforcing contracts and resolving disputes	B24	14	3.286	1.729	procedural	External	
Lack of home government assistance/incentives	B25	14	3.286	1.637	procedural	External	
Political instability_FM	B30b	14	3.286	1.490	business environment	External	
High tax and tariff barriers_FM	B31b	13	3.308	1.601	tax, tariff & non tariff	External	
High costs of Customs administration, in exporting or importing_FM	B34b	13	3.385	1.710	tax, tariff & non tariff	External	
Unfamiliarity with complexity of procedures/paperwork	B23	14	3.429	1.399	procedural	External	
Restrictive health, safety and technical standards (eg sanitary and phytosanitary requirements)_FM	B33b	13	3.462	1.613	tax, tariff & non tariff	External	
Offering technical/after-sales service	B13	14	3.500	1.454	product & price	Internal	
Inadequacy of basic and IT infrastructure_FM	B29b	13	3.538	1.330	business environment	External	
Anti-competitive or informal practices	B16	14	3.571	1.399	product & price	Internal	
Inadequate property rights protection (eg intellectual property)_HM	B32a	14	3.571	1.453	tax, tariff & non tariff	External	



	Lack of perceived benefits from joining production networks	B36	14	3.571	1.453	other barriers	External
	Unfavorable host/foreign rules and regulations	B27	14	3.643	1.393	procedural	External
	Inadequate property rights protection (eg intellectual property)_FM	B32b	13	3.769	1.589	tax, tariff & non tariff	External
Non-IPN	High tax and tariff barriers_HM	B31a	87	2.60	1.16	tax, tariff & non tariff	External
	Poor/deteriorating economic conditions_HM	B28a	87	2.63	1.12	business environment	External
	Willingness to adopt new business strategy or ideas	B37	87	2.86	1.08	other barriers	External
	Offering competitive prices to customers	B14	87	2.87	1.20	product &price	Internal
	Political instability_HM	B30a	87	2.90	1.14	business environment	External
	High costs of Customs administration, in exporting or importing_HM	B34a	87	2.92	1.18	tax, tariff & non tariff	External
	Difficulty in matching competitors' prices	B15	87	3.05	1.14	product &price	Internal
	Unfavorable home rules and regulations	B26	87	3.05	1.28	procedural	External
	Meeting product quality/standards/specifications	B11	87	3.06	1.19	product &price	Internal
	Developing new products	B9	87	3.09	1.13	product &price	Internal
	Establishing and maintaining trust with business partners	B19	87	3.09	1.21	distribution, logistics & promotion	Internal
	Inadequate property rights protection (eg intellectual property)_HM	B32a	87	3.09	1.28	tax, tariff & non tariff	External
	Limited Information to locate/analyze markets/business partners	B1	87	3.14	1.04	informational	Internal
	Shortage of working capital to finance new business plan	B7	87	3.14	1.21	functional	Internal
	Lack of home government assistance/incentives	B25	87	3.14	1.30	procedural	External
	Perceived risks in your current and new business operations	B35	87	3.14	1.05	other barriers	External
	Restrictive health, safety and technical standards (e.g., sanitary and phytosanitary requirements)_HM	B33a	87	3.15	1.04	tax, tariff & non tariff	External
	Adapting to demanded product design/style	B10	87	3.16	1.06	product &price	Internal
	Excessive transportation/insurance costs	B21	87	3.17	1.06	distribution, logistics & promotion	Internal

Unreliable market data (costs, prices, market shares)	B2	87	3.18	1.06	informational	Internal
Inability to indentify and contact potential business partners	B3	87	3.20	1.17	informational	Internal
Participation in promotional activities to target markets/business partners	B22	87	3.23	1.10	distribution, logistics & promotion	Internal
Insufficient quantity of and/or untrained personnel for market expansion	B5	87	3.26	1.02	functional	Internal
Meeting packaging/labeling requirements	B12	87	3.26	1.06	product & price	Internal
Inadequacy of basic and IT infrastructure_HM	B29a	87	3.26	1.04	business environment	External
Lack of production capacity to expand	B6	87	3.29	1.03	functional	Internal
Unavailability of inventories/warehousing facilities	B20	87	3.29	1.11	distribution, logistics & promotion	Internal
Unfavorable host/foreign rules and regulations	B27	87	3.30	1.38	procedural	External
Offering technical/after-sales service	B13	87	3.31	0.98	product & price	Internal
Difficulty in getting credit from suppliers and financial institutions	B8	87	3.34	1.19	functional	Internal
Anti-competitive or informal practices	B16	87	3.34	1.14	product & price	Internal
Complexity of production value chain	B17	87	3.34	1.03	distribution, logistics & promotion	Internal
Lack of perceived benefits from joining production networks	B36	87	3.36	0.99	other barriers	External
Poor/deteriorating economic conditions_FM	B28b	85	3.39	1.35	business environment	External
High costs of Customs administration, in exporting or importing_FM	B34b	86	3.40	1.34	tax, tariff & non tariff	External
Accessing a new production chain	B18	87	3.40	0.97	distribution, logistics & promotion	Internal
Difficulties in enforcing contracts and resolving disputes	B24	87	3.43	1.10	procedural	External
Unfamiliarity with complexity of procedures/paperwork	B23	87	3.44	1.03	procedural	External
Lack of managerial time to identify new business opportunities	B4	87	3.45	1.06	functional	Internal

Political instability_FM	B30b	87	3.45	1.30	business environment	External
High tax and tariff barriers_FM	B31b	86	3.48	1.39	tax, tariff & non tariff	External
Restrictive health, safety and technical standards (e.g., sanitary and phyto sanitary requirements)_FM	B33b	86	3.52	1.24	tax, tariff & non tariff	External
Inadequacy of basic and IT infrastructure_FM	B29b	85	3.60	1.19	business environment	External
Inadequate property rights protection (e.g., intellectual property)_FM	B32b	86	3.60	1.32	tax, tariff & non tariff	External

*Note:* \*HM: home

\*FM: foreign

Non-IPN firms cited almost the same barriers in their top ten: high tax and tariff barriers; poor and deteriorating economic conditions at home; unwillingness to adopt new business strategies or ideas; difficulties in offering competitive prices to customers; political instability; high costs of customs administration in exporting and importing; difficulty in meeting competitors' prices; unfavorable home rules and regulations; meeting product quality, standards, and specifications; and developing new products. Note that the standard deviations are small, implying consensus among the firms in the rankings of the respective barriers.

On the whole, both IPN and non-IPN firms perceive product and price barriers as their most important concern. For IPN firms, the top barriers to their operations are as follows: product and price; business environment; taxes, tariffs and non-tariff barriers; distribution, logistics and promotion; informational; functional; and procedural. For non-IPN firms, the rankings are as follows: product and price; taxes, tariffs, and non-tariff barriers; business environment; informational; distribution, logistics and promotion; functional; and procedural.

**Table 29. Most Important Barriers to Operations as Perceived by SMEs**

SME Group	Barrier Type	N	Mean	SD
Non-IPN	Product and Price barrier	86	2.94186	1.83659
	Tax, tariff, non-tariff	86	3.81395	2.45674
	Business Environment	86	3.88372	2.06608
	Informational barrier	86	4.05814	1.9903
	Distribution, logistics, promotion	86	4.36047	1.83375
	Functional barrier	86	4.66279	1.81892
	Procedural	86	4.75581	1.84669
	Other	86	7.52326	1.37821
IPN	Product and Price barrier	14	3	1.51911
	Business Environment	14	3.14286	2.0327
	Tax, tariff, non-tariff	14	4.07143	2.05555
	Distribution, logistics, promotion	14	4.14286	1.65748
	Informational barrier	14	4.5	2.13937
	Functional barrier	14	5	2.11224
	Procedural	14	5	2.38586
	Other	14	7.14286	2.0702
Total	Product and Price barrier	100	2.95	1.78871
	Business Environment	100	3.78	2.06745
	Tax, tariff, non-tariff	100	3.85	2.39686
	Informational barrier	100	4.12	2.00645
	Distribution, logistics, promotion	100	4.33	1.80378
	Functional barrier	100	4.71	1.85481
	Procedural	100	4.79	1.91904
	Other	100	7.47	1.48701

Firms were asked to rank the most effective assistance that would help them overcome the barriers to the conduct of their business. At the top of the list of IPN firms is the need for financing assistance. This is followed by market information, business linkages and networking, technology development, overall improvement in investment climate, training and counseling and advice. For non-IPN firms, the most crucial assistance needed is technology development followed by market information, business linkages and networking, financing, training, overall improvement in investment climate, training, and counseling and advice.

**Table 30. Firm Perception on Most Effective SME Assistance**

SME Group	Assistance Type	N	Mean	SD
Non-IPN	Technology Development and transfer	87	3.43678	1.72331
	Market Information	87	3.57471	1.58211
	Business linkages and networking	87	3.72414	1.80239
	Financing	87	3.72414	2.10586
	Training in general business management	87	3.94253	2.05368
	Overall improvement in investment climate	87	4.37931	2.40272
	Counseling and advice	87	5.10345	1.7523
	Others	2	8	0
IPN	Financing	14	3	1.41421
	Market Information	14	3.5	1.87083
	Business linkages and networking	14	3.57143	1.94992
	Technology Development and transfer	14	3.85714	1.9945
	Overall improvement in investment climate	14	4.14286	2.53763
	Training in general business management	14	4.35714	2.06089
	Counseling and advice	14	5.5	1.5064
All	Technology Development and transfer	101	3.49505	1.75854
	Market Information	101	3.56436	1.61503
	Financing	101	3.62376	2.03397
	Business linkages and networking	101	3.70297	1.81408
	Training in general business management	101	4	2.04939
	Overall improvement in investment climate	101	4.34653	2.41013
	Counseling and advice	101	5.15842	1.71891
	Others	2	8	0

The results confirm the findings of earlier studies identifying financing and technology constraints as key obstacles and areas where assistance would be most effective. For IPN firms, financing assistance would be most crucial while for non-IPN firms, technology development would be the most important.

Overall, the survey results show that the main barriers faced by SMEs stem from both internal and external factors that affect their operations. The more serious ones pertain to their weak competitiveness and domestic factors, particularly incoherent government policies and regulations and an unhealthy business environment that increases the costs of their business operations. For both IPN and non-IPN firms, the most important barriers pertain to product and price followed by business environment; tax, tariff and non-tariff; and information, distribution, logistics and promotion. If not properly addressed, these barriers could reduce their chances of survival and growth in a highly competitive world.

The results confirm the conclusions drawn from the existing studies on barriers to SME growth and development as discussed in the previous section (see sub-section 2.2). These studies highlighted the same barriers, such as lack of access to finance, low levels of technology, lack of information on market opportunities, as well as difficulties in product quality and marketing which resulted in SMEs' low levels of productivity and lack of competitiveness. The other barriers cited also include supply chain management problems arising from infrastructure and communication difficulties along with conflicting government policies and high tariffs on their intermediate inputs. The absence of common support facilities like testing centers and standardization agencies in the country also contributed to SMEs' problems regarding product quality and quality assurance of raw materials. Many SMEs have not invested in quality management system standards such as the ISO series.

## **5.2. Case Study of Two Medium Automotive Parts Enterprises**

Box 1 presents two contrasting cases of an IPN and a non-IPN firm with one being more successful than the other in terms of performance as well as in overcoming constraints to growth and development. Both are medium-sized manufacturers of auto parts and are 100% Filipino-owned. Both were established in the early 1970s and are of about the same age. The case study illustrates the problems affecting the operations of SMEs and how they faced these constraints, particularly those arising from the opening-up of the previously highly protected automotive industry.

Firm X is a manufacturer of mufflers, exhaust systems, brackets and stamped parts for both the domestic and export markets. By overcoming its own internal barriers,

mostly related to price and product, and changing its strategy, Firm X was able to adjust to the new liberalized environment. Convinced that the domestic automotive industry was no longer profitable, Firm X decided to shift its focus to the export market and concentrated its efforts towards producing quality products for export abroad. Currently Firm X exports 70% of its production. Locally, its major market consists of Toyota Motors, Isuzu, Nissan, Kawasaki and Honda Motorcycle.

#### Box 1: Overcoming Internal Barriers -- A Tale of Two Companies

Firm X manufactures metal parts with 70% of its production geared towards the export market. Currently their major market is the US, where the company exports shock absorber parts. In the domestic market, its major customers are Toyota, Isuzu, Nissan, Honda Motorcycle, and Kawasaki.

To increase its total productivity, it upgraded its equipment. The company aims to become a world class manufacturer of auto parts and components. Its R&D target is to start product redesign and enhance product reengineering. The company spends about 3% of total sales for R&D. It has a product development department which employs 5 workers. At present, their R&D activities cover product development from prototype, product reengineering, mold and die designing and evaluation and testing. In terms of the company's engineering testing capability; 3D CAD, CAM and CAE are utilized.

The defect rates set by major customers are 100 parts per million (ppm) for Toyota and 0.5PPM for export. There has been no major rejection in their domestic market. For their exports, the company offers a 1% annual rebate to customers to cover rejects. The company has a marketing arm based in the United States. It will open a market in Mexico and other parts of South America. The main problem the firm faces is how to raise the necessary capital needed for its market expansion abroad.

Firm Y began manufacturing brake discs for Mitsubishi (or Pamcor) in 1975 and from 1990, it began to supply Toyota. In 1991, Honda also became its customer. As a supplier of the top automotive firms in the country, the early nineties were the busiest and the most profitable years for the company. To keep up with demand, the company acquired additional CNC machines and automatic second-hand equipment. The company has its own foundry shop, the only one in the Philippines that is accredited by Japan.

After 1996, however, things started to change. One by one, its customers left. With the substantial cutbacks in demand that the industry has faced, the company has downsized its labor force. Though prices of its raw materials and power costs have been rising, the company has been experiencing difficulties in passing these increases onto its customers. Toyota wanted a 20% reduction in its price, a request the company could not agree to given the volume they are currently producing.

The company has also explored the possibility of entering the export market, but has not been successful. It has participated in trade fairs abroad and but has yet to close any deals. A French firm wanted 1.5 million pieces annually but was asking for a 15% price reduction. A Japanese firm, on the other hand, wanted the company to fulfill major requirements to enable it to penetrate the world market. In order to satisfy potential customers, the firm's most pressing need is to upgrade its existing equipment. In particular, their grinding operations and finishing process are not acceptable to Honda. Modernizing their finishing process would require an additional P12 million in new investment.

To reduce their costs, they are currently outsourcing their machining process. Their workload has been reduced tremendously. Toyota, whose affiliate company in Thailand owns a foundry, wants the company to do only the finishing of its brake discs which it imports from Thailand. Asian Transmission, sister company of Mitsubishi, has also asked it to do the finishing of its bearing retainers.

Source: Adapted from Aldaba (2007).

Firm X notes that its success in penetrating the export market was due to a combination of factors such as an effective marketing arm, capacity to manufacture high-quality products at low cost and the ability to deliver these on time, acquisition of modern machinery and equipment, and application of appropriate technology. Firm X has invested in computerized die-making facilities and is currently concentrating on product design. Firm X spends around 3% of its sales for R&D. The firm is concentrating its R&D efforts on improving its tool and die capability. It uses advanced engineering and testing facilities such as 3D CAD, CAM, CAE, and CAT. It has ISO certification and TS 16949.

Firm Y is a maker of brake disks and drums and has remained domestic-oriented. It produces mainly proprietary parts which cannot be sold directly to other customers or in the replacement market. The firm is aware that to penetrate the export market, it has to innovate and develop its own products. The firm has a very sizeable plant and a foundry shop, but they are severely underutilized. It does not have ISO certification and does not have any of the advanced facilities in which Firm X has invested.

With increasing competition from imports and a lack of domestic demand, the experience of the two firms shows that to survive in this era of liberalization in the



automotive industry and compete against imports and other domestic manufacturers, one has to expand one's market reach by exporting and not relying solely on the domestic market. To penetrate the export market, product and price barriers need to be addressed. It is important to note that the automotive industry is highly global; it is technology-driven; competition is intense and only the fittest firms survive: those that can offer the lowest cost, highest quality and most innovative products. Firm Y was able to survive by defining its strategy and market position. After the liberalization of the industry, it shifted its focus towards the international market and made serious efforts to find the right product mix as well as to improve its manufacturing efficiency and productivity by enhancing its capabilities and investing in product development.

### **5.3. Conclusions and Some Broad Policy Recommendations**

Overall, the survey shows that SMEs are not homogeneous as indicated by the differences in the overall characteristics and performance between firms operating within production networks and those outside these networks. While the two groups of firms share similar characteristics such as age, Filipino ownership, and foreign equity share, they differ in terms of performance as well as in other economic indicators used in the study. In terms of exported output, non-IPN firms surveyed exported a higher proportion of output than IPN firms. This is not surprising because IPN firms are not usually direct exporters but, rather, act as suppliers of parts and other intermediate inputs to assemblers and other levels or tiers in the overall production chain. With respect to skill intensity, non-IPN firms posted higher ratios than IPN firms.

In terms of the interest rates on borrowing that SMEs pay, IPN firms face lower rates compared to non-IPN firms. In addition, IPN firms have a lower share of interest payments in total cost and a much higher interest coverage ratio. In terms of financing sources for working capital and capital expansion, IPN firms' financing comes mainly from retained earnings and a small proportion from financial institutions. Non-IPN firms also use their retained earnings as well as sources of financing from financial institutions and elsewhere.

The survey results also show that participation in IPNs benefits SMEs, particularly parts and components makers in the electronics and transport industries. In terms of performance, the survey results show that IPN firms have higher mean growth rates

than non-IPN firms. Their mean profit rates are approximately the same but in terms of mean labor productivity; the mean for IPN firms is higher than for non-IPN firms.

The survey also indicates that there are two main types of barriers that emerge as the most important concerns of SMEs. IPN firms are primarily concerned with product and price barrier difficulties in establishing and maintaining trust with business partners while non-IPN firms' major concerns are tax, tariff and non-tariff barriers and the country's deteriorating business environment. The following internal and external barriers are perceived by firms as the most important constraints affecting their growth and prospects for participation in production networks:

### **IPN Firms**

Product and price barriers:

- difficulties in offering competitive prices to customers (1)
- meeting product quality, standards, and specifications (2)
- developing new products (4)

Distribution, logistics and promotion barriers:

- difficulties in establishing and maintaining trust with business partners (3)

Functional barriers

- difficulty in obtaining credit from suppliers and financial institutions (6)
- shortage of working capital to finance new business plan (9)

Tax, tariff and non-tariff barriers

- high tax and tariffs at home (7)

Informational barriers:

- inability to identify and contact potential business partners (8)

Business environment barriers

- poor and deteriorating economic conditions at home (10)

Other barriers

- willingness to adopt new business strategy and idea (5)

### **Non-IPN Firms**

Tax, tariff and non-tariff barriers

- high tax and tariffs at home (1)

- high costs of customs administration at home (6)

#### Business environment barriers

- poor and deteriorating economic conditions at home (2)
- political instability (5)

#### Product and price barriers:

- difficulties in offering competitive prices to customers (4)
- meeting product quality, standards, and specifications (9)
- developing new products (10)

#### Functional barriers

- difficulty in obtaining credit from suppliers and financial institutions (7)

#### Procedural barriers

- unfavorable home rules and regulations (8)

#### Other barriers

- willingness to adopt new business strategy and ideas (3)

The above results confirm the main findings on barriers to SME growth and development identified in the existing Philippine SME literature as well as those discussed in the case study. Studies on SMEs highlighted the same barriers, such as lack of access to finance, low levels of technology, lack of information on market opportunities, as well as difficulties in product quality and marketing. The other barriers cited in the literature also include supply-chain management problems arising from infrastructure and communication difficulties along with incoherent government policy and high tariffs affecting the intermediate inputs used by SMEs. The case study shows that overcoming these barriers, particularly product and price, is crucial for production network participation.

The responses summarized in Table 30 are instructive in the formulation of government policy measures to strengthen SMEs, to enable them to participate in regional production networks and enter the export market. As the results show, there are two themes that dominate SMEs' concerns about the type of assistance needed. For IPN firms, financing assistance would be crucial while for non-IPN firms, technology development is seen as the most important.

#### IPN

- 1) financing assistance
- 2) market information
- 3) business linkages and networking
- 4) technology development
- 5) overall improvement in investment climate
- 6) training
- 7) counseling and advice

#### Non-IPN firms

- 1) technology development
- 2) market information
- 3) business linkages and networking
- 4) financing
- 5) training
- 6) overall improvement in investment climate
- 7) counseling and advice

Given the large number of barriers that SMEs face, participating in IPNs is not easy. Making small and medium manufacturers internationally competitive is a major challenge that would require government support and close coordination between the government and the SME sector. In light of this, the government could facilitate SMEs' gainful participation in IPNs through:

First, designing a coherent set of policies and programs tailor-made for IPN firms. It is also necessary to review current government support programs to find out whether or not they benefit IPN firms and to re-orient the programs to focus on deepening SME participation in international production networks.

Second, raising awareness of the potential of participation in IPNs and comprehensive understanding of the advantages and potential of sub-contracting. It is

important to develop a program to provide information exchange to local firms to make strategic linkages with MNCs. Supplier development and linkage programs should be developed to improve linkages between domestic firms, especially SMEs, with foreign affiliates of MNCs. The government could facilitate the matching of firms as well as providing subcontracting and outsourcing advice to domestic firms.

Third, addressing financing issues including inadequate working capital, insufficient equity, difficulties of credit finding and prohibitively expensive credit cost since these have severely constrained the growth of SMEs. Private banks are reluctant to lend to SMEs because of their general aversion to dealing with a large number of small accounts. Many SMEs cannot access available funds due to their limited track record, limited acceptable collateral, and inadequate financial statements and business plans. Some private banks were able to overcome these challenges by providing assistance in preparing accounting records, business advice, and simplifying loan documentation and customizing loans to match the borrower's cash flow.

Fourth, improving the technological capabilities and strengthening supply chains are necessary to enable SMEs to move up the technology scale as well as to create and enhance existing linkages with production networks. This would require the development of specialized skills and technological capabilities, particularly in electronics and auto parts. One possible way to achieve this is to design and grant incentives to encourage universities and researchers to interact more closely with industry. The Philippines can learn from the experiences of South Korea, Taiwan, and Singapore which all set up centralized institutions to monitor and diffuse new technologies and provided technological services to small and medium enterprises (SMEs) in particular.

Last but not least is the need to create an enabling environment for firms to survive and realize their potential to grow. This is a crucial precondition for private sector investment (domestic or foreign). Sound infrastructure and logistics that lower production costs and facilitate the easy supply chain management from the procurement of inputs to the export of outputs are also important for the operations of production networks. The government must continue to pursue policies to lower power and communication costs, provide sufficient port systems, reduce travel time, and offer travel and shipment options. To improve the country's overall investment climate, the

government needs to immediately focus not only on inadequate infrastructure but also on the country's low institutional quality, corruption and inefficient bureaucracy that continue to constrain doing business in the country.

## References

- Aldaba, R. (2008) "SMEs in the Philippine Manufacturing Industry and Globalization: Meeting the Development Challenges". Chapter 8 in ERIA Research Project Report 2007 No. 5. In *Asian SMEs and Globalization*, ed. Lim, H..
- \_\_\_\_\_ (2007) "Assessing the Competitiveness of the Philippine Auto Parts Industry", Philippine Institute for Development Studies (PIDS) Discussion Paper 2007-14.
- Agarwalla, Gokul (2005) "Study of Linkages in the Philippines Electronics Industry." Power Point Presentation. Manila, Philippines
- Antonio, Emilio Jr. and Rodolfo, Ma. Cherry Lyn (2006) "Assessment of Competitiveness and Logistics Infrastructure of the Philippine Garments Industry." Philippine Institute for Development Studies Discussion Paper Series No. 96-07. Makati, Philippines
- Austria, M. (2006a) "Enhancement and Deepening of the Competitiveness of the Philippine Electronics Industry Under a Bilateral Setting". PIDS Discussion Paper Series 2006-09. Philippine Institute for Development Studies. Makati City, Philippines.
- \_\_\_\_\_ (2006b) "Foreign Direct Investment and Economic Development: The Case of the Philippines". In *Multinationals and Economic Growth in East Asia*, ed. Urata, S., C. SiowYue, and F. Kimura.. London, Routledge.
- FINEX and ACERD (2006) "Making SMEs Work, Making SMEs Create Work: Job Creation Through Small and Medium Enterprise Development". A joint paper by the Ateneo Center for Research and Development (ACERD) and the Financial Executives Institute of the Philippines (FINEX)
- Fukumoto, Mayumi (1998) "Development Policies for Small and Medium Enterprises in APEC-In the case of the Philippines." APEC Study Center Institute of Developing Economies.
- Gereffi, Gary (2003) "The Global Apparel Value Chain: What Prospects for Upgrading by Developing Countries?" Vienna Australia: United Nations Industrial Development Organization.
- Hapitan, R. (2005). "Competition Policy and Access of Small and Medium Enterprises (SMEs) to Financial Services: A Review of Selected SMEs", Philippine Institute for Development Studies.
- Kawai, M. (2004) "Trade and Investment Integration for Development in East Asia: A Case for the Trade-FDI Nexus". Institute of Social Science, University of Tokyo.
- Maxwell Stamp PLC (2001) "Strengthening Export Competitiveness", Study conducted for the Asian Development Bank under TA 3345-PHI.
- Santiago, Ernie (2005) "About The Philippine Electronics Industry: A Snapshot." Power Point Presentation. Manila, Philippines.

Tecson, Gwendolyn (2004) "Review of Existing Policies Affecting Micro, Small and Medium Enterprises (MSMEs) In the Philippines" Makati Philippines: Small and Medium Enterprises and Development for Sustainable Employment Program.



## CHAPTER 12

# **Integrating China's Small and Medium Enterprises into International Production Networks: Barriers and Policy Responses**

**SUN XUEGONG**

**LIU XUEYAN<sup>1</sup>**

Institute of Economic Research,  
National Development and Reform Commission (NDRC)

*Small and medium enterprises (SMEs) play an important role in China's economy, contributing a significant share of GDP, employment and tax. As China has been increasingly integrating with the world and regional economy, SMEs have been presented with opportunities to be part of international production networks. However, their lack of access to external financing, weak business capabilities, less competitive prices and quality of products, and a deficiency of market information have proved to be major barriers for their integration into networks, as suggested by this survey conducted in Tianjin city, China. The survey also shows that other significant factors inhibiting integration include the location of an SME, measured both by distance to a major sea or air port, and by whether or not it is situated in a development zone, the education attainment of its employees, the size of the SME and the industry in which it operates. Policy needs to address both the barriers to integration and the most needed assistance, as perceived by the SME. Based on the survey, China should improve the access of SMEs to financing by adjusting the financial structure and market, strengthen the business capability of SMEs by better public service, modernize the information service to SMEs, and improve the use of development zones so as to boost integration.*

---

<sup>1</sup> Both authors are from Institute of Economic Research, National Development and Reform Commission of China. The views expressed here are those of authors, not necessarily representing the institution for which they work.

## **1. Introduction**

### **1.1. Overview**

SMEs play an important role in China's economy, contributing a significant share of GDP, employment and tax. As China has been increasingly integrating with the world and regional economy, SMEs have been presented with opportunities to be part of international production networks. Evidence suggests that being part of a network would help an SME to grow quickly, to upgrade itself technologically, and to improve its profitability. In an increasingly globalised economy, integration into international production networks is a sure route to success for an SME. However, there are also daunting challenges for an SME before it can join a network. This survey-based study organized by ERIA tries to identify the major barriers for SME integration. Based on analysis of the survey results, a policy recommendation will be put forward.

### **1.2. Literature Survey**

#### *1.2.1. SMEs in International Production Networks*

China's accession to the World Trade Organization (WTO) gave a big push for China's SMEs to participate in international production networks. Although national data are lacking, some empirical studies reveal that China's SMEs are now more involved in international production networks than before. For example, the Haige group, an SME from Heilongjiang province, provides remote controllers for all DVD players produced by Philips. Additionally, a Shandong chicken farm won a contract with Kentucky Fried Chicken to provide chicken products to this multinational with worldwide operations (Liu Dandong; Jiao Hongyan, 2004).

But there are still daunting challenges and difficulties for SMEs to overcome if they

wish to be integrated into international production networks. First, the SME is, more often than not, poorly equipped, so its product barely meets the quality requirements of an international production network. A survey showed that in the Pearl Delta region, a highly developed region in China, only 1% of SMEs are equipped with internationally advanced machines or installations, 58% of SME's have equipment at the middle or even at a low level domestically, in terms of technology. (Liang Da, 2008) Second, related to first challenge, an SME in China is not usually capable of conducting R&D activities. But joining international production networks involved an amount of R&D, such as remodeling products to meet network requirements of, or carrying out continuous quality improvement. In China, SMEs account for less than 40% of total R&D expenditure, much lower than the level in a developed country. 70% of SMEs spend less than 1% of turnover on R&D. Many believe that only those companies which spend 5% or more of turnover on R&D are viable. Third, SMEs are usually financially weak, with very low operation margins, and are unable to afford international information gathering and product promotion. So an SME is less likely to gain access to international markets. Fourth, difficulty in accessing financing also contributes to the misery of an SME involved in international trade, since in many transactions payment comes only after delivery. Furthermore an SME needs to raise funds to finance its production activity. In China, the banking sector is dominated by big banks. Due to high transaction costs and SME lack of collateral, the big banks are reluctant to lend to an SME. The SME also usually fails to meet the requirements for capital market fundraising. As a result, China's SMEs rely greatly on internal financing or informal financing, seriously limiting their expansion. Fifth, the SME also suffers from its low credibility. Without a proven track record, an SME very often finds it difficult to win the trust of a potential partner. Sixth, intermediary services such as consultancy, accounting

and legal services in China are not well developed. This situation, on the one hand, prevents the SME from being more specialized. On the other hand, the SME has to face the difficulties unaided by proper assistance from professionals.

### *1.2.2. Major Policy Initiatives to Promote SME Development*

Well aware of the difficulties faced by SMEs, China's government has worked out policy initiatives to tackle them. In June 2002 China promulgated its first SME promotion Act. In February 2005 the State Council issued a policy paper aimed at encouraging, supporting and guiding the development of the non-state-owned sector; In 2006, in the 11th National Development Plan, the government launched a project aimed at promoting the growth of SMEs; Most recently, in August 2009 the State Council issued 6 new policy measures for promoting SME development in the context of the financial crisis (China SME Information Net, 2009).

The main contents of the policy package include:

1. Creating an enabling environment in which SMEs can fairly compete with big business and be treated equally. SMEs should also enjoy some preference in the government procurement market and a grace period for contribution to the Social Security Fund.
2. Mitigating the difficulties of access to financing by SMEs by establishing a risk compensation fund for loans made to SMEs. Also a multi-layer SME loan guarantee fund jointly financed by central and local government will be put in place. In banking supervision, a differentiated standard should be applied to SME related business so as to give the banks extra incentive to make loans to SMEs. A Nasdaq-like stock market will soon be launched to increase access to direct financing by innovative SMEs.
3. Increasing fiscal support to SMEs. First, to increase the funds set aside for SME

development in the central government budget, in order to support innovation, restructuring and employment. Then to launch a state SME development fund as soon as possible, encouraging more private funds to invest in SMEs. Finally to apply tax credits to SMEs with small margins.

4. Speeding up the technological progress and restructuring of SMEs. Central and local government should set aside funds in their budgets to support the technology upgrade of SMEs. Cooperation between big and small enterprises is also encouraged.

5. Supporting qualified SMEs to participate in government-sponsored consumption-boosting programs, such as the program for home appliances, cars and motor cycles for rural areas, and a “cash for clunkers” program.

6. Strengthening and improving the service to SMEs by actively fostering the institutions that provide professional services to SMEs. Also building a public platform, incubator, and information network for better service to SMEs. Finally reducing red tape for a better regulatory environment.

## **2. SMEs in the Economy and in Production Networks**

### **2.1. SMEs in the Economy**

National economic census data show that SMEs represent 99.81% of total enterprises, with middle sized enterprises accounting for 1.78%, and small businesses 98.03%. In 2004 the total operation revenue of SMEs reached 1.67 trillion RMB, accounting for 60.42% of the total. It is estimated that SMEs accounted for 60% of national GDP, and 50% of total government tax revenue. SMEs in the industrial sector contribute 66.28% of total industrial output and 55.17% of total tax. These data show

that the SME is and remains the mainstay of China's economy.

SMEs play an even bigger role in creating employment. National economic census data reveal that SMEs account for 81.89% of total non-agricultural employment. Most Chinese SMEs are in the private sector. In past decades, the state owned sector, dominated by big businesses, has been shedding jobs. This situation makes SMEs a major creator of new jobs. In 2006, the private sector provided jobs to 1.1 million unemployed, accounting for 75% of the total unemployed.

SMEs also play an important role in innovation. In China, 66% of total patents are owned by SMEs. 82% of new product development is done by SMEs. In the high tech sector, SMEs are also very active. Statistics show 98.4% of enterprise situated in national high-tech industrious parks are SMEs, in industries such as ICT, biotech, new materials, consultancy, design and modern logistics.

Up to now, the SME's role in the foreign trade sector has not been recorded by official statistics. However, a widely accepted estimate is that SMEs account for 70% of total foreign trade. In the labor-intensive sectors, such as apparel, clothing, toys and shoes, SMEs may account for 90% of exports. In some high tech sectors, such as ICT and biotech, SMEs are seeing a rising share of exports.

## **2.2. SMEs in International Production Networks**

Based on the literature survey and our own observations, we can tentatively summarize several ways in which SMEs can be integrated into production networks. One is the "flagship enterprise" model. With relatively sound infrastructure, low labor cost and a comprehensive industry system, multinationals poured into China and built production facilities here. The domestic SMEs therefore got the chance to join the supply chains of those giant multinationals. For example, in Dongguan, Guangdong

Province, many SMEs became involved in PC production networks, producing cases, keyboards, mice, power sources, cables, etc. The second model of how SMEs can be integrated into international networks is the SME cluster. In some areas of China, especially in Zhejiang Province, there is a large number of SMEs in the same industry located together. This gives an SME in a cluster an advantage in information, supply of raw materials, and transfer of technology. Many of these SME clusters are in the export sector, whereby the SME can access international production networks. For example, more than 500 lighter producers, almost all of them SMEs, concentrate in Wenzhou City, Zhejiang Province, accounting for 70% of total worldwide production. The third model is of Original Equipment Manufacturer (OEM). There is quite a large number of SMEs in the apparel and electronics sectors who joined networks by way of OEM. These SMEs usually have strong production capabilities, but are weak in design and marketing. The fourth model is e-commerce. In the past decade, China witnessed a boom in e-commerce. For example, Alibaba, a startup 10 years ago, is now a world leading e-commerce company. The sales volume of the Alibaba platform has been larger than that of any mortar and brick retailer in China. There are many e-commerce companies devoted to providing service to SMEs to facilitate their participation in international trade. E-commerce helps SMEs to break information barriers, making it possible to access markets previously inaccessible.

### **3. Preliminary Results of the Survey**

#### **3.1. Introduction**

The survey was conducted by the Tianjin SME Service Center (TSSC), which is

affiliated to the Tianjin Municipal Economic Commission and the Tianjin Bureau for SME Promotion. TSSC was created in 2001 to provide various services to SMEs, such as consultancy, training, legal services, marketing information, expo and business travel services and financing and credit guarantees.

The choice of Tianjin as survey site is based on the following facts. Tianjin is one of four municipalities directly administered by central government; the three others are Beijing, Shanghai and Chongqing. In recent years Tianjin has been emerging as the new economic powerhouse of China, boosted by big projects, both domestic and foreign. Among them, the Airbus assembly plant- the only one outside Europe- is best known. The automobile and electronic sectors are among the most important in Tianjin, and foreign enterprise plays a big role in these sectors. Tianjin is also biggest port in north China. All these factors provide potential opportunities for SMEs to be integrated into international production networks.

TSSC randomly selected the SMEs for survey and distributed the questionnaires to them through its subsidiaries, with guideline that give full explanation for each entry in the questionnaire. Telephone help was also available. In total about 250 questionnaires were distributed, the total returned was 167, and the total useable was 101. The low responding and useable rates, 66.8% and 60.5% respectively, may be due to SMEs' reluctance to disclose their financial information, as the timing of the survey coincided with special tax collection efforts by the Chinese government to meet its tax revenue target in the second half of 2009.

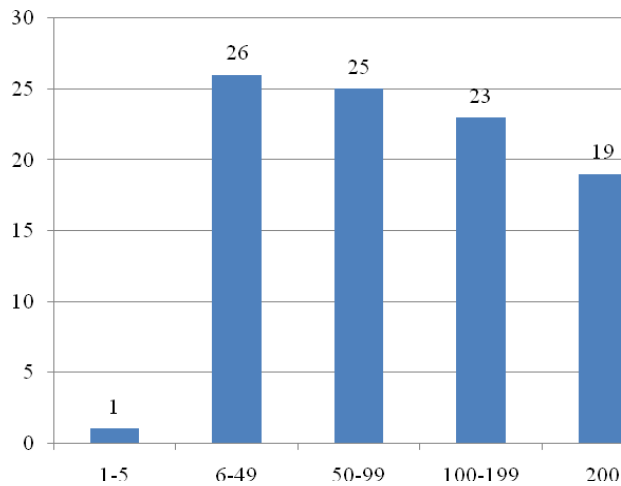
### **3.2. The Characteristics of the Sample**

The total of useable samples collected in the survey was 101. The size of most SMEs surveyed is between 6-200 employees. The SMEs in this size range account for



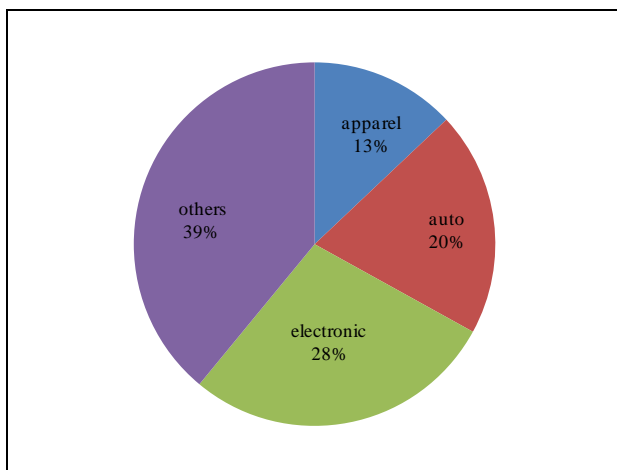
80% of the total, and are almost evenly distributed between three size groups, namely 6-49, 50-99, and 100-199 (see figure 1). There are also some middle sized SMEs, defined here as having more than 200 employees, accounting for 20% of total. However, there was only one micro SME, employing less than 5 people, in the sample. The size distribution of the sample is consistent with the general situation of China's SME sector, which usually outnumbers its foreign counterpart in terms of employment.

**Figure 1. Size Distribution of SMEs**



As for the distribution of SMEs by industry, 60% of SMEs are in the targeted industries of this survey, namely apparel, auto parts and electronics and electrical appliances, which account for 13%, 20% and 28% respectively. The remaining 40% are mostly in the service and technology sectors (see figure 2)

**Figure 2. Industry Distribution of SMEs**



In the sample, 44% of SMEs are less than 5 years old, while those older than 10 years account for 36%. The 6-9 years old SMEs account for 20% of the total. The relatively low proportion of middle aged SMEs may suggest that the 6-9 year-old period is the most difficult time for SMEs. If they survive this period, then they will live quite a bit longer.

Most SMEs in the sample are domestically owned, accounting for 92% of total. The SMEs with foreign shareholdings account for about 8% of the total. And SMEs with a government stake holding are few and far between, only accounting for 3% of the total.

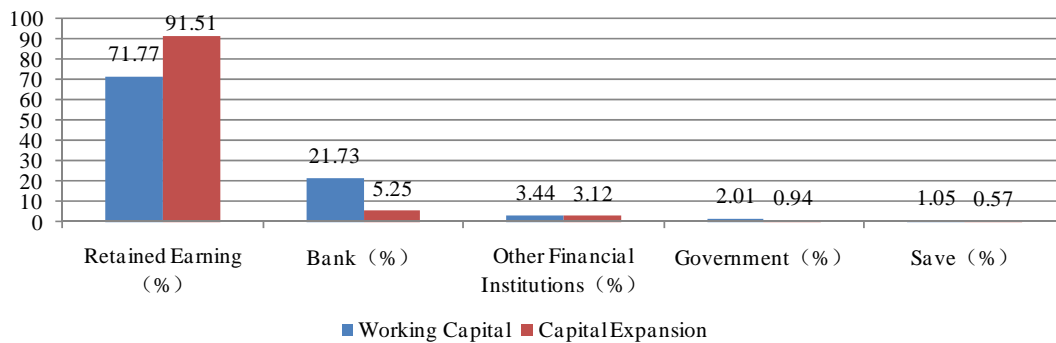
The SMEs in the survey did quite well between 2007-2008. As the whole, total sales grew by 31.7%. 80% of SMEs recorded positive growth in this period. The average sale in 2007 was 4.82 million US dollars and 6.35 million US dollars in 2008. However, there are big differences among SMEs in terms of total sales. The bigger ones could be several hundred times larger than the smaller ones.

In the cost structure of the SMEs, raw materials and intermediate inputs are the biggest part of the cost, usually accounting for 30-60% of total cost. In our sample, 60% of SMEs reported their materials cost shares fell in this range. The sample-wide average share is 49%. The median of the sample is 45%. The labor cost just followed the

materials cost, usually accounting for 10-30% of total cost; more than 60% of the surveyed SMEs were in this range. The average share of labor to total cost is 22% and the median is 20.5%. Utility cost, was a close third, with average share of 19.1% and median 20%. Interest cost is negligible for most SMEs as they seldom rely on external financing.

The survey confirms that internal financing is a predominant source of SMEs' financing. This is especially true for capital expenditure. In our sample, retained earning accounts for 91.51% of capital spending and 71.77% of working capital respectively. Bank lending serves as the second important source of SME financing. It is quite significant for financing working capital of SMEs, accounting for 21.73%. In capital spending, bank lending is less important, accounting for only 5%. The other sources of financing are negligible, their combined shares in the total SME financing, including both working capital and capital spending, are less than 10%. The financing difficulties of SMEs are not limited to the availability of finance, but also include its cost. The survey showed that the interest on borrowings of SMEs is as high as 20% while the prevailing rate of one year lending now stands at 5.31% (see figure 3).

**Figure 3. SME Financing Sources**



Most SMEs have multiple sources of raw materials and components. Local SMEs

and other domestic suppliers are equally important, both with 54% of SMEs who are their clients. The local large business, however, is less likely to be a supplier of local SMEs, with 48% of SMEs having such supply relations (see table 1). The plausible explanation may be that SMEs are more suppliers to, rather than clients of, local large business.

**Table 1. Sources of SME Raw Materials and Components**

Q8	AVERAGE	Percentage
Other Local SMEs	66.97%	54.00%
Local Large Firms	67.11%	48.00%
Other Domestic Suppliers	67.03%	54.00%

The SMEs also have multiple sales channels. Sales to final assemblers, and to direct retailers or wholesalers, are most important, with 59% and 46% of total SMEs respectively involving these two activities. Sales to first tier component producers are also common, 45% of SMEs do this. Sales to second and higher tier producers, however, are significantly less common. Less than 30% of SMEs do this (see table 2).

**Table 2. SME Sales Channels**

Q9	Average	Total	Small	Middle	Large
Final Assembler	47	59%	35.59%	16.95%	47.46%
First Tier	42.29	45%	46.67%	22.22%	31.11%
Second Tier	37	28%	67.86%	17.86%	14.29%
Third Tier and More	25	24%	75.00%	20.83%	4.17%
Retail and wholesale	62.86	46%	47.83%	36.96%	15.22%

About two thirds of SMEs carried out at least one activity that would help strengthen their business capability in the past three years. The most common activity was involvement in a business association, R&D network and/or trade fair. 71% of SMEs reported they carried out this activity. Also, 69% of SMEs reported they introduced new

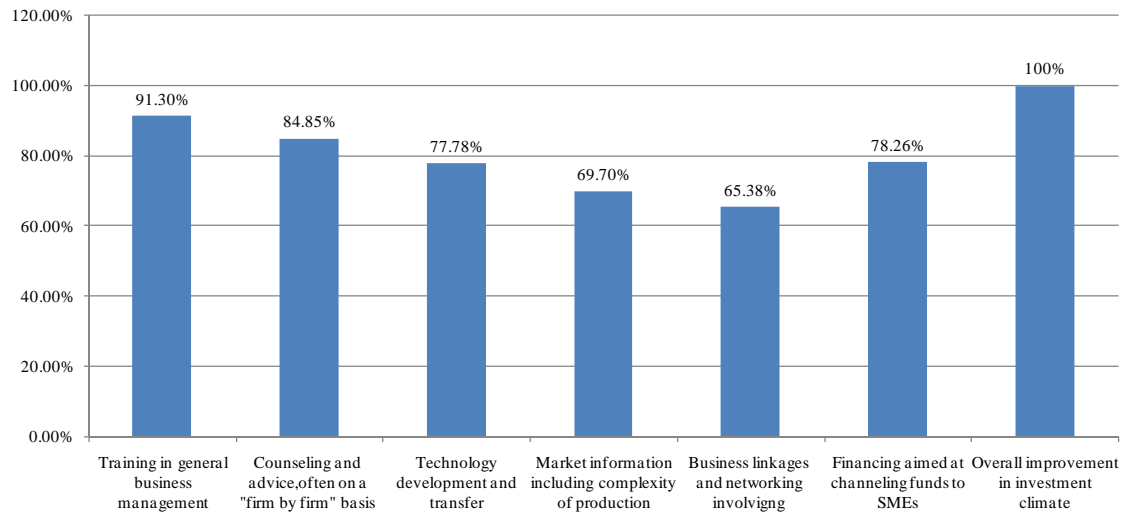
production methods or new products or services in the past three years. However, the SMEs who reorganized their structures are among a minority, only 46% of SMEs did this. It seems that China's SMEs are more concerned with technology change rather than with changes to management and organization.(see table 3)

**Table 3. Activities that Strengthen the Business Capability of SMEs**

B	A
international standard	65%
Introduced ICT	61%
new divisions	46%
business associations	71%
new machines	66%
existing machines	65%
new production methods	69%
new products or services	69%
new market	51%
new technologies	66%

The survey shows that the quite a few SMEs have received assistances from government and other sources. As many as 65% of SMEs received management training, or training in marketing, accountancy and financing, and more than 90% of them found the training was effective. (see figure 4)The other assistance that quite a large number of SMEs received was counseling and advice, the provision of market information and technology development. More than 45% of SMEs reported they received this kind of help. And this help was thought effective by most SMEs, with an approval rate of 70% or higher. The assistance that was not offered very much included improvement of the investment climate, financing, and business linkage. Less than 40% of SMEs had ever got this kind of help. (see table 4)

**Figure 4. The Proportion of SMEs who Received Assistance and Rated it Effective**



**Table 4. Assistances Received By SMEs**

Q12	total	in	Out
<i>Training</i>	64.95%	53.85%	67.06%
<i>Counseling and advice</i>	52.81%	41.67%	54.55%
<i>Technology development</i>	46.59%	33.33%	48.05%
<i>Market information</i>	47.73%	50.00%	47.37%
<i>Business linkages</i>	35.87%	38.46%	35.44%
<i>Financing</i>	39.13%	38.46%	40.00%
<i>Investment climate</i>	34.09%	38.46%	32.89%

### **3.3. The Characteristics of SMEs In and Out of Production Networks: Evidence from Description Statistics**

The SMEs that are part of production networks show different characteristics from SMEs that are not, as descriptive statistics reveal.

First, the SMEs which belong to production networks are more concentrated in the auto parts industry than other industries. 75% of SMEs in the auto parts industry are members of production networks compared to 26% of SMEs in electronics and other industries. The SMEs in the garment industry are least likely to belong to networks. This result is not surprising, as an SME is rarely a final assembler of automobiles, while an

SME is much more likely to be a provider of final products in the garment sector. (see table 5)

**Table 5. Distribution of SMEs in Production Networks by Type and Age**

Type	Production network					Total
	1-5	6-49	50-99	100-199	>200	
1.Garments	0	0	0	0	0	0
2.Parts,Components,and Automotives (including motorbikes)	0	3	3	4	5	15
3.Electrical, Electronics, Parts and machinery	0	3	0	2	2	7
4.Other	0	4	0	4	2	10
<b>Total</b>	<b>0</b>	<b>10</b>	<b>3</b>	<b>10</b>	<b>9</b>	<b>32</b>

Second, the SMEs which are members of production networks are more likely to locate close to a port as table 6 suggests (see table 6). 100% of SMEs in networks are within 2 hours of a port while the percentage for SMEs outside networks within 2 hours of a port is 80%. 30% of SMEs in the networks are within 30km from a port; for those outside networks the percentage is 15%.

**Table 6. Time and Distance from a Port**

Hours	Frequency(%) by status in production network	
	OUT	IN
Near Port(less than 0.5 hours)	0	5
Moderately near(between 0.5 10 and 1 hours)	0	0
Moderately far (between 1 and 2 hours)	80	95
Far(More than 2 hours)	20	0
Distance	Frequency(%) by status in production network	
	OUT	IN
Near Port(less than 10Km)	0	2.8
Moderately near(between 10 and 30Km)	15.6	27.8
Moderately far (between 30 and 45Km)	28.9	27.8

Third, the SMEs in production networks receive more bank loans than those that are outside. Although in general the SME relies primarily on internal financing, the SMEs in production networks do receive some bank loans. Bank loans account for 23% of total working capital financing for SMEs in networks, compared to 12% for SMEs outside networks. For capital expansion, the share of bank loans is 4.8% and 2.4% for SMEs inside and outside networks respectively (see table 7). As result, the SMEs in

networks pay a little more in interest than those that are outside as table 8 shows (see table 8).

**Table 7. SME Funding Sources**

Production Net: Working Capital :

	Frequency(%) by status in production network	
	OUT	IN
Funding source: Retained earnings	62.5	46.74
Funding source: bank	12	22.67
Funding source: other financial institutions	2.77	3
Funding source: other(gov't assistance, informal source, etc.)	50.2	18

Production Expansion / Capital Expansion

	Frequency(%) by status in production network	
	OUT	IN
Funding source: Retained earnings	62.1	54.56
Funding source: bank	2.43	4.79
Funding source: other financial institutions	1.34	2.98
Funding source: other(govt assistance, informal source, etc.)	21	20

**Table 8. SME Interest Cost**

	Frequency(%) by status in production network	
	OUT	IN
ICR1(ICR less than 11.5)	57.1	66.7
ICR2(ICR between 11.5 and 25)	19.0	16.7
ICR3(ICR between 25 and 71.4)	4.8	5.5
ICR4(ICR more than 71.4)	19.1	11.1
	Frequency(%) by status in production network	
	OUT	IN
Intsh1(Intsh less than 1%)	42.9	36.8
Intsh2(Intsh between 1% and 5%)	57.1	57.9
Intsh4(Intsh more than 5%)		5.3

The performances of SMEs in networks is better than those that are outside, if the performance is measured by labor productivity. The proportion of SMEs whose labor productivity is higher than 23.8 is 64.3% for those in networks and 50% for those who are not. (see table 9)

**Table 9. SME Labor Productivity**

	Frequency(%) by status in production network	
	OUT	IN
LP1(LP less than 3.7)	3.4	0
LP2(LP between 3.7 and 8.9)	10.4	9.5
LP3(LP between 8.9 and 23.8)	36.2	26.2
LP4(LP more than 23.8)	50	64.3



The improvement of existing machinery and facilities and the introduction of new products seem to constitute no constraint for SMEs' participation in production networks, evidenced by table 10. The table shows that a higher percentage of those outside networks improved existing machinery and facilities. For introduction of new products, the percentage of those inside is just slightly higher than those outside. (see table 10)

**Table 10. SME Technology Characteristics**

	Frequency(%) by status in production network	
	OUT	IN
Has improved existing machinery and facilities	80.5	55.2
Has not improved existing machinery and facilities	29.5	44.8
	Frequency(%) by status in production network	
	OUT	IN
Has introduced new products last 3 years	68.5	70.7
Has not introduced new products last 3 years	31.5	29.3

The descriptive statistics seem to suggest that industry, location, financial channel and labor productivity are positively linked to the participation of SMEs in production networks, while the improvement of existing machinery and facilities and introduction of new product are not.

### **3.4. Identifying the Constraints for Participating in a Production Network:**

#### **Results from Econometric Analysis**

A probit regression is made to further test the relationship between participation in networks and factors inferred by descriptive statistics.

The regression results (see table 11) show that the industry of the SME is a very strong factor in the probability of participation of an SME in a production network. More specifically, if the SME is in the auto industry, its probability of participation in a network is much higher than otherwise.

The regression also tends to suggest that the size, degree of government ownership, performance, and skill intensity of an SME are all positively related to the probability of participation, as the coefficients of these variables are positive. However, these relationships are not very reliable, because they are not statistically significant at the 10% confident level. The suggested relationships are consistent with common sense.

The regression also shows that the distance to port and share of interest in total cost are negatively related to the probability of participation. The distance variable is also not statistically significant, while the interest variable is. This result may suggest that financial constraints are more prominent for SMEs outside networks. Or, in other words, the participation of an SME in a network may mitigate the financing difficulties faced by SMEs in general.

For the variables of technological readiness of the SME, the regression found that involvement in a business network; acquisition of new machinery and acquisition of production knowledge are positively related to the probability of participation. And the relationships are statistically significant. This suggests that the SME really does need to prepare itself before it can participate in a production network.

**Table 11. Regression Result: Participation in Production Network**

Independent Variable	Dependent Variable: (Participation in Production Network)		
SIZE	0.001 (0.53)	0.001 (0.52)	0.001 (0.49)
AUTO	1.33 (3.7)***	1.43 (3.85)***	1.31 (3.7)***
GOV	0.28 (0.27)	0.69 (0.69)	0.51 (0.52)
LP	0.005 (1.254321)		
Profit		2.16 (1.24)	
growth			0.07 (0.95)
SI	0.08 (0.22)	0.10 (0.26)	0.11 (0.28)
C	-0.959 (-2.45)**	-1.066 (-2.53)**	-0.838 (-2.25)**
Wald Chi <sup>2</sup>	18.45	18.38	17.7
McFadden R <sup>2</sup>	0.145	0.145	0.140
Observations	97	97	97

\*\*\* significant 1%

\*\* significant at 5%.

\* significant at 10%

*Remark:* Absolute value of z statistics in parentheses.

Independent Variable	Dependent Variable: (Participation in Production Network)		
Size	0.004 (0.759)	0.003 (1.269)	0.002 (0.037)
Labour productivity	0.002 (0.176)	0.004 (0.038)	0.007 (0.574)
Interest Coverage Ratio	0.005 (0.221)		0.018 (0.693)
Share of interest payment in total cost		-0.131 (-1.744)*	
Distance to port			-0.624 (-1.205)
Skill intensity	0.754 (0.765)	1.995 (1.819)*	0.941 (0.871)
Constant	-1.051 (-1.100)	-0.390 (-0.463)	-0.384 (-0.351)
Wald Chi <sup>2</sup>	4.56	10.18	3.66
McFadden R <sup>2</sup>	0.14	0.29	0.13
Observations	24	25	20

Independent Variable	Dependent Variable: (Participation in Production Network)							
size	0.004 (1.658)	0.003 (1.242)	0.003 (1.469)	0.002 (1.023)	0.002 (0.989)	0.004 (1.593)	0.002 (1.029)	0.003 (1.282)
Labour productivity	0.003 (0.498)	0.004 (0.694)	0.004 (0.761)	0.009 (1.392)	0.003 (0.628)	0.003 (0.587)	0.004 (0.693)	0.004 (0.764)
Skill intensity	0.204 (0.406)	0.401 (0.678)	0.339 (0.631)	0.339 (0.556)	0.278 (0.559)	0.262 (0.494)	0.283 (0.545)	0.372 (0.687)
Dummy variable for meeting international standard	-0.748 (-1.573)							
Dummy variable for have introduced ICT		0.110 (0.283)						
Dummy variable for have established new division			-0.337 (-0.831)					
Dummy variable for involving in business network				1.379 (2.589)*				
Dummy variable for acquiring new machinery					0.671 (1.617)*			
Dummy variable for improving existing machinery						-0.719 (-1.325)		
Dummy variable for acquiring production knowledge							0.788 (1.846)*	
Dummy variable for ability of introducing new products								0.161 (0.411)
Constant	0.256 (0.415)	-0.439 (-0.721)	-0.266 (-0.469)	-1.548 (-2.005)	-0.635 (-1.174)	0.237 (0.329)	-0.784 (-1.410)	-0.458 (-0.799)
Wald Chi <sup>2</sup>	6.68		5.25	11.06	6.73	6.32	7.94	4.43
Pseudo R <sup>2</sup>	0.10		0.08	0.17	0.10	0.10	0.12	0.07
Observations	53		51	51	53	53	52	52

### 3.5. Identifying the Constraints for SMEs Engaging in International Business:

#### Results from Econometric Analysis

We regard the SME as “international” if it answers “yes” to at least one of following 3 questions. One is if there is any foreign share in its ownership, the second is if any input of the SME comes from abroad, and the last one is if its product is for export. In our sample, there are 14 SMEs, or 14% of the total surveyed, that we regard as “international”. The constraints that may limit SMEs engaging in international business will be identified by a discrete dependent variable model. In the case of this survey, the dependent variable is whether the SME can be regarded as international, as we defined. The value of these dependent variables either 1, integrated, or 0, not integrated. So, more specifically, a binary model is used. We tested quite a large number of variables,

both numeric and qualitative, and we report the variables as significant as follows. The model's statistical results are presented in table 12. (see table 12)

**Table 12. Regression Result: Factors for SME Internationalization**

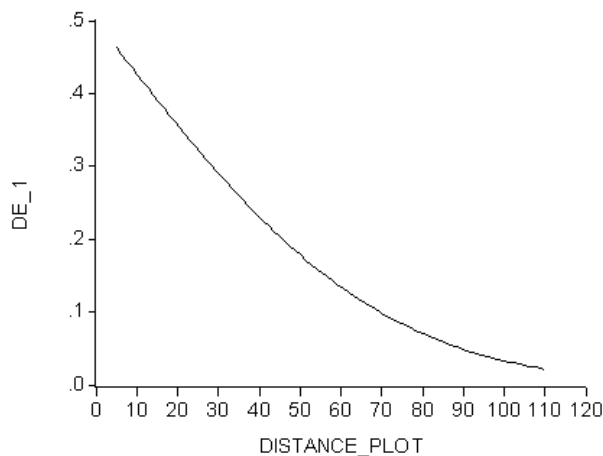
Independent Variables	Dependent Variable: go international or not		
C	-1.102 (-2.901)	-2.077 (-3.200)	-2.095 (-3.271)
Within industrial park	0.278 (0.465)	0.972 (2.552)	0.735 (2.05)
Staff with tertiary degree	0.002 (0.111)		
Size of SME		0.198 (1.246)	
Type of industry			0.271 (1.431)
Distance to port			-0.0184 (-5.390)

Perception of Constraints to SMEs

### 3.5.1. Location

The model demonstrates that the location of an SME, measured both by if it is located in a development zone and its distance to a major sea or air port is significant in explaining whether or not it is “international”. The distance clearly relates to transportation cost and its significance is expected. From the figure 5, we can see that that longer distances decrease the probability of a SME being integrated.

**Figure 5. Probability Distribution of SME Integration by Distance**

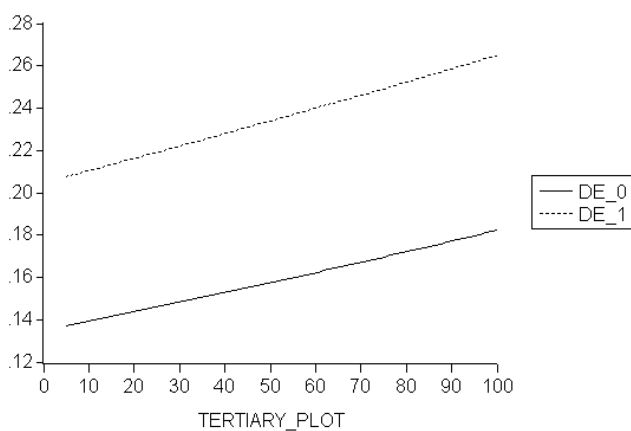


Development zones are strong factors in deciding the value of a dependent variable. In China's case, development zones usually provide better business services and good opportunities for SMEs to build their connections with other enterprises. We include this variable in different models to check if other variables are still significant under controlled situation.

### 3.5.2. Educational Attainment

The model confirmed that the educational attainment of employees is significant for the internationalization of an SME. The figure shows that the higher the percentage the staff with a tertiary degree, the higher the probability that an SME is integrated internationally. Location in a development zone again increases the possibility of internationalization. (see figure 6) The perception data in the questionnaire reconfirmed the importance of the quality of employees, as SMEs cite the lack of qualified personnel as the single most important reason for their enterprise failing to grow.

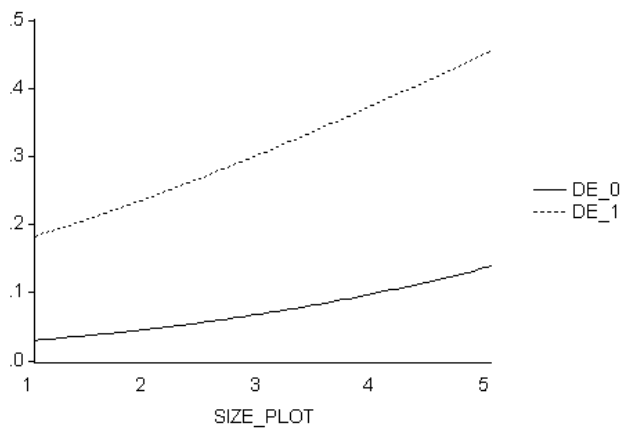
**Figure 6. Probability Distribution of SME Internationalization by Percentage of Staff with Tertiary Degree**



### 3.5.3. Size of SME

The model reveals that the size of an SME is positively related to the probability of internationalization. The bigger the SME, the higher the probability (see figure 7). The bigger SME is more often than not better equipped and technologically advanced, enabling it to meet international standards.

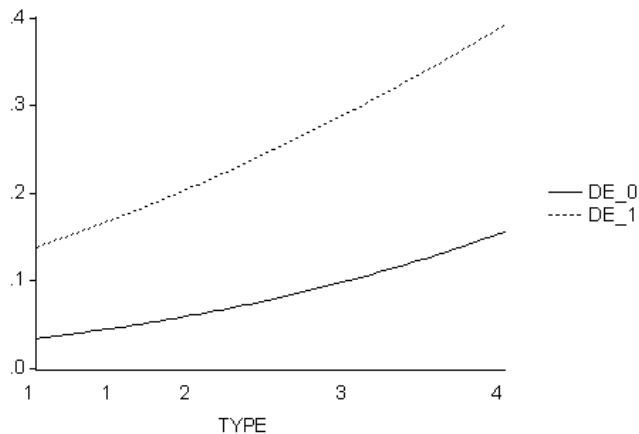
**Figure 7. Probability Distribution of SME Internationalization by Size**



### 3.5.4. Industry

The model shows also that the industry of an SME affects the likelihood of it being integrated internationally. The apparel industry has the least probability of integration. The electronics and auto industries have a higher probability of integration. However, the industries other than apparel, electronics and auto, among them there are quite a large number of technology enterprises, has the highest probability of international integration. (see figure 8) This conclusion may not hold true nation-wide. In Tianjin, the strong presence of foreign electronics giants, such as Motorola and Samsung, may help explain this conclusion.

**Figure 8. Probability Distribution of SME Internationalization by Type**



*Note:* Type 1, 2, 3, 4 denote apparel, electronics, auto and other industry respectively.

### 3.5.5. *Brief Conclusion*

The model concluded that the location of an SME, its training efforts, the size of the SME and its industry are all significant to the probability of its internationalization. While we also tested the variables relating to business potentials and assistance received, we didn't find them significant.

## 3.6. Identification of the Constraints from Perception Data

Figure 9 show that product and price barriers, the functional barrier and the information barrier are the most important factors that hinder the integration of an SME into an international production network. The proportion of SMEs who rated the importance of the three barriers mentioned above as being above 3 on an 8 point scale are 72.1%, 57% and 53.5% respectively for the barrier of product and price, the functional barrier and the information barrier. (see figure 9)



**Figure 9. Proportion of SMEs who rated the Importance of a Barrier at above 3 on an 8-point Scale**

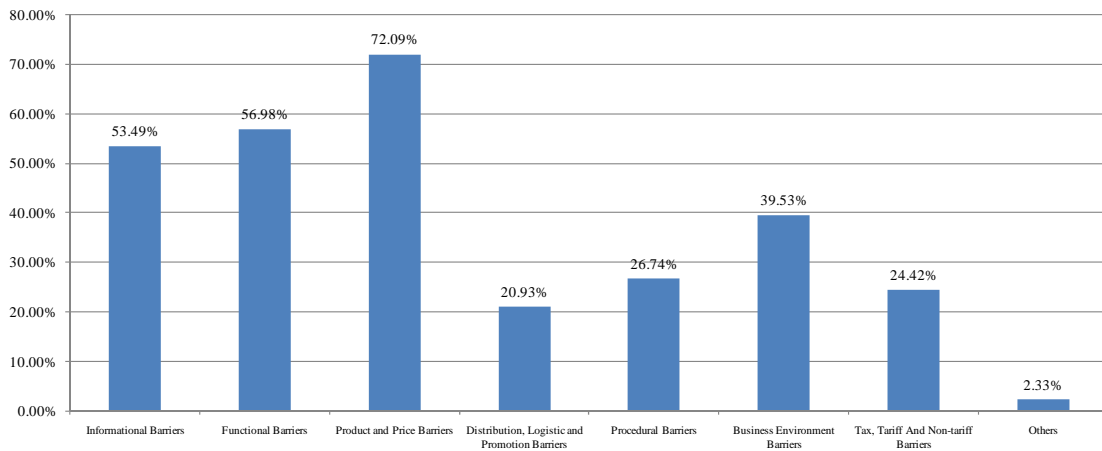


Table 13 produced a similar result using different measures. However, table13 reveals the differences in perceived barriers between those inside and outside production networks. Those in the networks put the barrier of the business environment ahead of the information barrier, while those outside did the opposite. This suggests that joining a network may help an SME to overcome the information barrier; while, on the other hand, it may expose the SME to a foreign business environment that it finds difficult to handle. (see table 13)

**Table 13. Ranked SME Constraints by Category**

rank	Total	in	Out
1	product and price	product and price	information
2	Information	business environment	functional
3	Functional	functional	product and price
4	business environment	information	distribution, logistics
5	distribution, logistics	procedural	business environment
6	Procedural	tax, tariff and non-tariff	procedural
7	tax, tariff and non-tariff	distribution, logistics	tax, tariff and non-tariff
8	Other	other	Other

Looking into the details, the barriers in subcategories that the SMEs thought the most important are 1-insufficient quantity of and/or untrained personnel for market

expansion, 2-shortage of working capital to finance new business plans, 3-lack of production capacity for expansion, 4-lack of managerial time to identify new business opportunities, 5-difficulty in getting credit from suppliers and financial institutions, 6-developing new products, 7-adapting to demanded product design/style, 8-difficulty in matching competitors' prices, 9-anti-competitive or other informal practices. The proportions of SMEs who thought the importance of the above barriers was above 2 on a 5 point scale vary from 10% to 40%. (see figure 10)

**Figure10. Proportion of SMEs who rated the Importance of a Barrier at above 2 on a 5-point Scale**

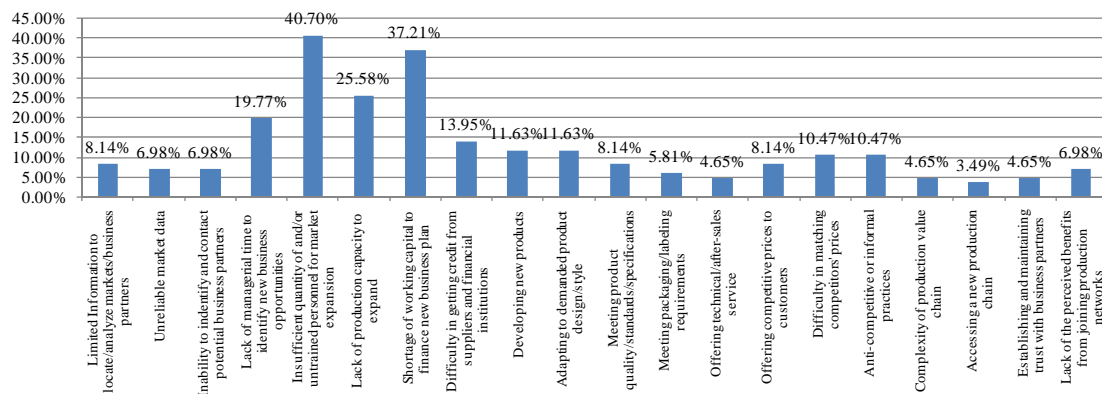


Table 14 reveals the difference in constraints perceived by those inside and outside networks. Not surprisingly, those in a network found the high cost of customs administration in exporting or importing to be the most significant constraint for them, followed by high taxes and tariffs in foreign markets. Those outside networks, however, believed the lack of qualified staff and access to financing were the most significant constraints. The difference suggests that joining a network significantly changed the environment of the SME's operations. The SME has to face quite different problems after joining a network. (see table 14)

**Table 14. Ranked Top-ten Constraints Faced by SMEs (Mean)**

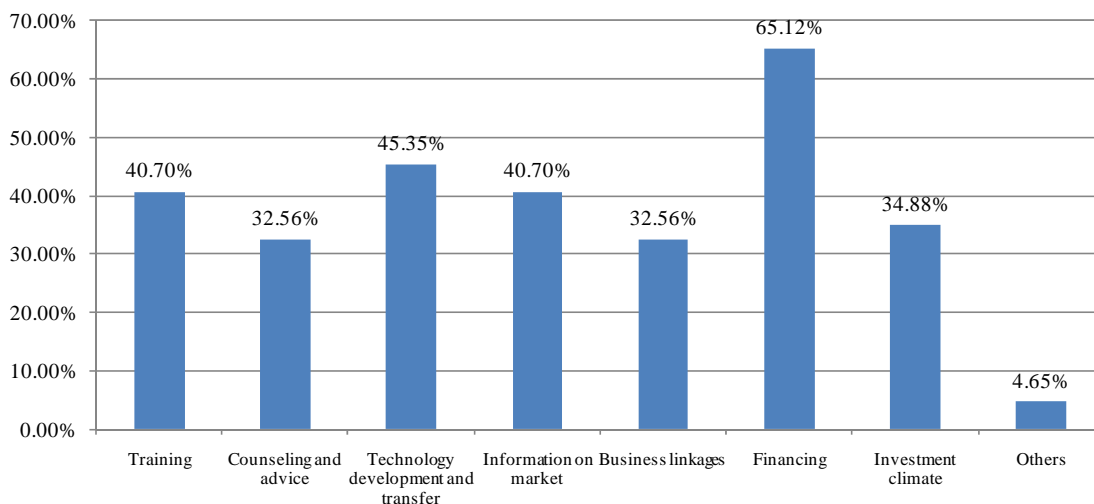
Rank	All sample	Production net	
		In	Out
1	B5 insufficient quantity of and /or untrained personnel for market expansion	B34 high costs of customs administration in exporting or importing	B5 insufficient quantity of and /or untrained personnel for market expansion
2	B7 shortage of working capital to finance new business plan	B31 high tax and tariff (foreign)	B7 shortage of working capital to finance new business plan
3	B31 high tax and tariff (foreign)	B32 inadequate property rights protection(home)	B6. Lack of production capacity for expansion
4	B6. lack of production capacity to expand	B31. high tax and tariff barriers(home)	B8. Difficulty in getting credit from suppliers and financial institutions
5	B34 high costs of customs administration in exporting or importing(foreign)	B34. high costs of customs administration, in exporting or importing(home)	B9. Developing new products
6	B32. inadequate property rights protection (home)	B33. restrictive health, safety and technical standards (home)	B4. Lack of managerial time to identify new business opportunities
7	B35. perceived risks in your current and new business operations	B28. poor/deteriorating economic conditions(foreign)	B35. Perceived risks in your current and new business operations
8	B28. poor/deteriorating economic conditions(foreign)	B5 insufficient quantity of and /or untrained personnel for market expansion	B10. Adapting to demanded product design/style
9	B31. high tax and tariff barriers(home)	B7. shortage of working capital to finance new business plan	B31. High tax and tariff barriers(foreign)
10	B33. restrictive health, safety and technical standards (home)	B23. unfamiliarity with complexity of procedures/paperwork	B1. Limited Information to locate/analyze markets/business partners

#### 4. Policy Implications

Based on the survey, policy needs to address both the barriers that the SMEs thought most important to their business development and the assistance that SMEs think most needed. We have already shown that the most important barriers are product and price, function and information.

The most needed assistance is financing, as more than 65% of SMEs rate it at least above 3 on an 8 point scale. The next most important kinds of assistance are technology development and transfer, training and market information. (see figure 11)

**Figure 11. Proportion of SMEs who rated the Importance of Assistance at above 3 on an 8-point Scale**



The SMEs inside and outside networks have minor differences in the assistance they most desire, as table 15 reveals. Those in networks thought that financing was most important, while those outside chose training. The choice of training as most important is consistent with the barrier perception of SMEs outside networks, who thought the lack of qualified staff was their most significant barrier. Those in networks who chose financing as the assistance they most wanted may have done so because the questionnaire offered no option in relation to their top difficulty, namely the high cost of customs administration in exporting or importing. (see table 15)

**Table 15. Ranked Perception of Assistances to SMEs by Degree of Importance**

Rank	All Sample	Production net	
		In	Out
1	Financing	financing	training
2	technology development and transfer	technology development and transfer	technology development and transfer
3	Training	information on market	information on market
4	information on market	training	counseling and advice
5	counseling and advice	counseling and advice	financing
6	business linkages and networking	overall improvement in investment climate	business linkages and networking
7	overall improvement in investment climate	business linkages and networking	overall improvement in investment climate
8	Others	others	others

Based on both barriers and the assistance wanted, we believe that policy should focus on the following aspects:

#### **4.1. Improving SME Access to Financing**

The survey reconfirmed that SMEs in China still lack access to the financing they need. Internal financing is almost the only channel for SME financing, thus limiting the SMEs' rate of growth. However, improving the access of SME to financing in China is a daunting challenge, as the banking sector is dominated by big state banks. Cost-effectiveness does not favor the SMEs as the transaction cost for making loans to SMEs is disproportionately higher than making loans to big business. Another problem is linked to the predominately private ownership of small business. The employees in a state owned bank may find themselves in a difficult position if a loan to an SME is in default. The lack of risk information about SMEs also contributes to their financing predicament.

To address the above problems, a multi-pronged approach is needed. First, China should proceed with its financial reform to allow small financial institutions to play a bigger role. Based on their comparative advantage, small financial institutions are more suitable for providing financial services to SMEs. Second, China needs to further open its financial market to the private sector to better serve the privately-owned SMEs. Third, to mitigate the risk associated with SME loans, the government-sponsored loan guarantee program needs to be further expanded, and a credit information collection and publication system needs to be put in place to help financial institutions properly price the risks. Fourth, China needs to further expand direct financing for SMEs. Recent moves, such as the launching of an SME and venture board in the stock market marks a obvious progress in this direction. However, more efforts are still needed in the

corporate bond market and the capital market for non-listed SMEs.

#### **4.2. Strengthening SMEs' Business Capability**

The lack of adequate business capability in both technology and human resources constitutes a prominent barrier to SMEs' growth, and their integration into international production networks. The public technology service system needs to be strengthened. This system should, on the one hand, provide a platform to help SMEs to upgrade their technology and products to meet international standards. On the other hand, the system should help the transfer of technology to SMEs to sharpen their competitive edge. The availability of qualified staff is also a crucial factor for SMEs' growth, and most SMEs suffer from a shortage of qualified staff. There are several policy options to address this problem. First, a better professional service system for SMEs needs to be developed. In China, a social service system for SMEs has been created. One example is Tianjin's SME service center, which helped to conduct this survey. The next task is to make the service system more effective. Second, more training should be offered to improve the management, and especially marketing, skills of SMEs. Third, policy to encourage entrepreneurship of college graduates should be strengthened.

#### **4.3. Modernizing Information Services for SMEs.**

The lack of market information is a problem that an SME has to face on a daily basis. The traditional way to address this problem is costly. However, e-commerce provides a unique opportunity for SMEs to leapfrog. Efforts need to be made to improve the IT literacy of SMEs, and incentives to encourage SME investment in IT hardware needs to be in place. The e-commerce sector also plays a very important role in improving information services to SMEs. Alibaba, the biggest e-commerce company in China,

who offer a platform for business to benchmark each other, claims to target SMEs specifically. Policy is also needed to assure a sustained growth in e-commerce.

#### **4.4. Better Usage of Development Zones to Boost Integration of SME s into International Production Networks**

As the survey suggested, a development zone can serve as a strong catalyst for SMEs to integrate into international production networks. The development zone usually provides better professional, technological, and information services, and also sound infrastructure. And even more importantly, the SMEs located in development zones can build good connections with other SMEs and big businesses, increasing their chances of integration into production networks. And in China, enterprises in development zones usually enjoy favorable policy. It would be very much to the benefit of SMEs to concentrate in development zones. In China's situation, policy coordination and tax arrangements at local government level are crucial to achieve the concentration of SMEs in development zone. More effort is needed in this area.

## References

Liang Da (2008), "Multiple Measures are needed to Bail out SME", *Shanghai Security Journal*.

Liu Dandong; Jiao Hongyan (2004), "How SME Enter into MNC Industry Chain". *China Business Update*, 03.

### ✧ Website

China SME information net,

<http://policy.sme.gov.cn/longcon/sites/zhengcefagui/index.jsp> (accessed January 11, 2010)



## CHAPTER 13

# Japanese SMEs and International Production/ Distribution Networks in East Asia

MITSUYO ANDO

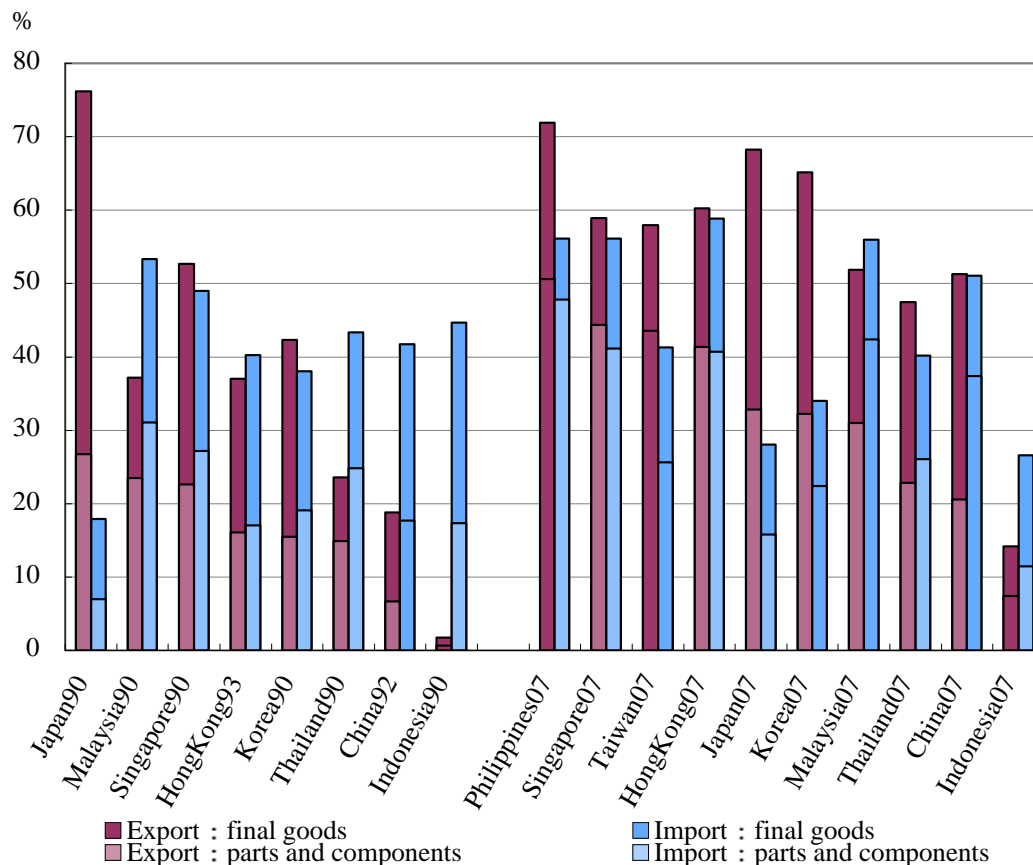
Faculty of Business and Commerce, Keio University, Japan

*This paper attempts to investigate the mechanisms and features of the development of international production/distribution networks in East Asia, focusing on Japanese SMEs, from the viewpoint of one of the major players in the regional production networks. Our empirical analysis using various surveys and micro data of Japanese firms demonstrates that active FDI in vertical supply chains by SMEs, particularly in recent years, contributes to the formation of agglomeration and industrial clusters and further development of the networks in East Asia. Our analysis also demonstrates that competitive SMEs are likely to expand their operations both domestically and internationally, mainly in East Asia, by effectively being involved in the production/distribution networks in the region. To further develop international production networks and to deeply involve SMEs in the networks, various facilitation measures are important for both hosting and investing countries. All the efforts from various different angles for both sides should encourage SMEs to be an essential part of international production/distribution networks in East Asia, and thereby assist in strengthening their competitiveness by effectively being involved in these networks.*

## **1. Introduction**

In East Asia, international production/distribution networks in manufacturing, particularly machinery industries, have been formed since the 1990s and further developed in recent years. In conjunction with the development of production networks in the region, vertical back-and-forth transactions of parts and components have dramatically increased. Figure 1 presents the shares of machinery final goods and intermediate goods in total exports to/imports from the world for East Asian countries. The machinery trade, mainly machinery parts and components, as a share of total trade rapidly expanded from the beginning of the 1990s to 2007 for both exports and imports, which suggests the existence of back-and-forth transactions and export-oriented operations in East Asia. In addition, when countries are listed starting from the highest share of machinery parts and components exports (non-East Asian countries are not presented in Figure 1), most countries with the higher shares of machinery intermediate goods exports are East Asian countries in 2007 whereas they were developed countries at the beginning of the 1990s. This indicates an increasing importance of machinery trade, particularly the machinery parts and components trade, in each economy in absolute and relative terms.

**Figure 1. Machinery Final and Intermediate Goods as a Share of Total Trade in East Asian Countries**



*Data source:* author's preparation, using UN Comtrade and World Trade Atlas d

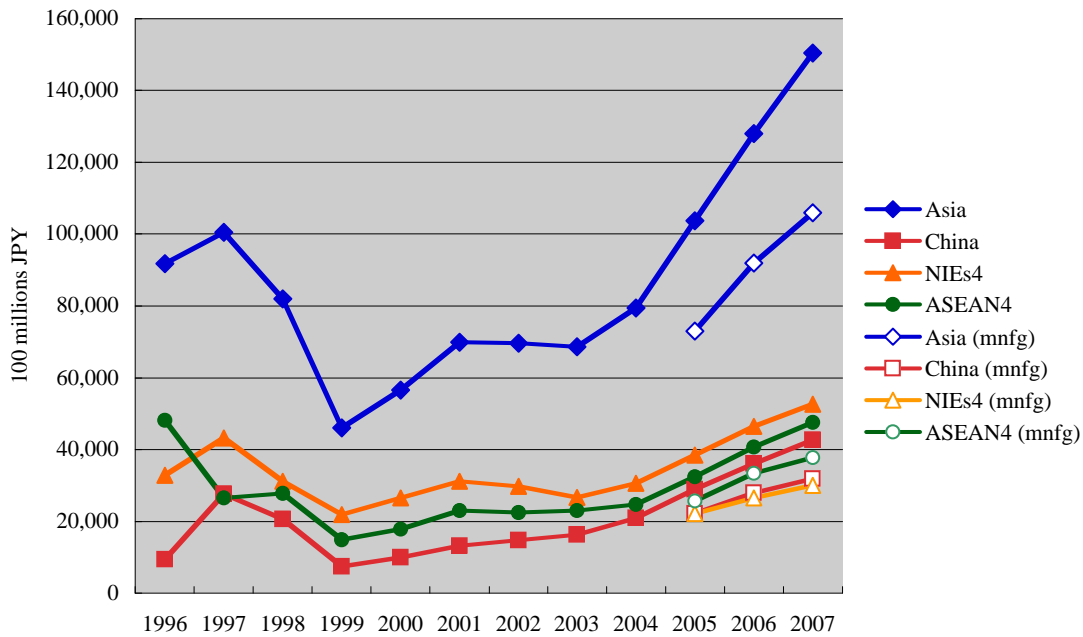
*Notes:* Machinery industries are HS84-92. The definition of machinery parts and components is based on Ando and Kimura (2005) and the revised versions. Machinery final goods trade is obtained by deleting machinery parts components from total machinery trade.

Such an expansion of back-and-forth transactions of machinery parts and components trade in East Asia is induced by intra-regional transactions. For instance, machinery intermediate goods trade in 2000 and 2007 for China, ASEAN4, NIEs4, and Japan demonstrates that intra-regional trade shares have increased for both exports and imports (except the case of China's exports). These reached the range of 55 percent to 73

percent for exports and from 63 percent to 82 percent for imports. Considering an explosive expansion of trade values *per se* (from 525.7 billions US\$ in 2000 to 1099.3 billions US\$ in 2007 for exports and from 418.0 billions US\$ to 974.1 billions US\$ for imports), including China's exports (from 38.2 billions US\$ to 250.5 billions US\$), it implies how rapidly and explosively back-and-forth transactions of East Asian machinery parts and components have expanded within the region.

Japanese firms are some of the major players in the production networks of the region. Since the late 1990's in particular, Japanese investment in East Asia has accelerated; as Figure 1 describes, an upward trend is vividly observed for direct investment position of Japan (i.e. foreign direct investment (FDI) stock) in East Asia based on the balance of payments statistics. Moreover, a predominant portion of the investment is in manufacturing sectors; the manufacturing share of Japanese direct investment position for 2007 is 70 percent for East Asia as a whole, 75 percent for China, 80 percent for the Association of Southeast Asian Nations (ASEAN) 4 including the Philippines (75 percent), Indonesia (75 percent), Thailand (80 percent), and Malaysia (86 percent), and 57 percent for Newly Industrializing Economies (NIEs) 4 including Taiwan (72 percent), Korea (61 percent), Singapore (58 percent), and Hong Kong (38 percent).

**Figure 2. Japanese Direct Investment Position in Asia**



Data source: BOJ.

Of course, Japanese small and medium sized enterprises (SMEs) are active in investment in East Asia, particularly in the manufacturing sector. This paper attempts to investigate the mechanism and features of the development of international production/distribution networks, focusing on patterns of exports and investment by SMEs, from the viewpoint of one of major investors in the region, and draw some policy implications. For that purpose, this paper first attempts to uncover the features of overseas activities of Japanese SMEs in terms of destinations of their exports as well as form of exports, partners for direct exports, reasons/purposes of their investment, and so on, based on several surveys. Then, our paper analyzes patterns of FDI by Japanese SMEs, employing the micro data of Japanese firms and previous related studies, from the perspective of international production/distribution networks. We also briefly discuss

economic and policy environment for SMEs.

The rest of the paper is organized as follows: the next section provides overviews of Japanese SMEs in terms of their export and investment patterns. Section 3 investigates the patterns of FDI by Japanese SMEs, based on the firm-level data. This section also discusses patterns of globalizing activities of Japanese firms and their domestic operations. Then, Section 4 briefly discusses economic and policy environment for SMEs, followed by conclusions in Section 5.

## **2. Overviews of Japanese SMEs and Their Exports and Investment Abroad**

This section discusses overviews of Japanese SMEs and their export and investment patterns, using *2009F/Y White Paper on Small and Medium Enterprises in Japan* (SME Agency, 2009a) and *Basic Survey of Small and Medium Enterprises 2009* (SME Agency, 2009b), which are published by the Small and Medium Enterprise Agency. Note that since we do not have an access to the raw data of Basic Survey, we can use only aggregated data. Moreover, the original source of some tables and figures in the *White Paper* is Mitsubishi UFJ Research and Consulting Co., Ltd. (2008). This survey was conducted in March 2008 targeting 55,000 firms, and the return ratio was 15.7%. Therefore, the coverage of firms in this survey may not be so comprehensive as others.

In Japan, the New Small and Medium Enterprise Basic Law defines SMEs as firms

with 300 or less regular workers or capital of no more than 300 millions JP yen, except for the wholesale, retail, and service sectors; regular workers of 100 or less for wholesale and services and 50 or less for retail or capital of no more than 100 millions for wholesales and 50 millions for retail and services.<sup>1</sup> Based on this definition, 99.7% of firms in Japan in all sectors other than primary sectors are classified into SMEs, and almost 70 percent of regular workers in Japan belong to them (Table 1). In addition, over 10 percent of Japanese SMEs and over 20 percent of regular workers in Japanese SMEs are engaged in manufacturing sectors. Clearly, SMEs make up an essential part of manufacturing activities in Japan.

---

<sup>1</sup> See Table A.1 for features of the SME Basic Law including the definition. In this section, SMEs are defined as such unless specified and large firms are firms other than SMEs.

**Table 1. SMEs and Large Firms in Japan, 2006**

Industry	All sized firms		SMEs: the number of firms			SMEs: the number of regular workers		
	The number of firms	The number of regular workers		(%by industry)	(% in total)		(%by industry)	(% in total)
Mining	2,086	25,189	2,082	99.8	0.0	22,062	87.6	0.1
Construction	489,645	3,290,238	489,343	99.9	11.7	2,882,090	87.6	10.4
Manufacturing	457,623	9,424,333	455,621	99.6	10.9	5,903,494	62.6	21.2
Electricity, gas, and water supply	567	190,768	537	94.7	0.0	27,477	14.4	0.1
Information and communication	35,052	1,426,491	33,814	96.5	0.8	666,888	46.8	2.4
Transportation	77,403	2,594,245	77,132	99.6	1.8	1,857,903	71.6	6.7
Wholesale	233,846	3,328,161	231,755	99.1	5.5	2,322,118	69.8	8.3
Retail	880,575	6,610,931	877,875	99.7	20.9	4,286,343	64.8	15.4
Finance and insurance	30,256	1,010,855	29,985	99.1	0.7	170,470	16.9	0.6
Real estates	285,812	794,713	285,710	100.0	6.8	698,796	87.9	2.5
Restaurants and lodgings	648,614	3,555,630	647,754	99.9	15.4	2,820,399	79.3	10.1
Medical services	188,752	1,173,472	188,514	99.9	4.5	1,082,606	92.3	3.9
Education services	115,934	544,038	115,803	99.9	2.8	458,300	84.2	1.6
Multi services	3,718	8,395	3,717	100.0	0.1	8,246	98.2	0.0
Other services	760,187	6,149,521	758,077	99.7	18.1	4,628,358	75.3	16.6
Total (excl. primary sectors)	4,210,070	40,126,980	4,197,719	99.7	100.0	27,835,550	69.4	100.0

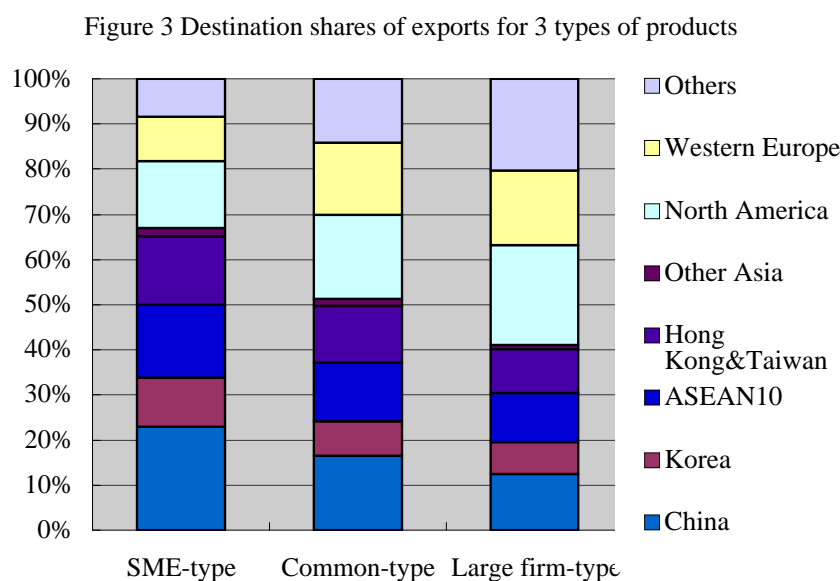
*Data source:* author's preparation, based on SME Agency (2009a)

*Note:* The number of firms here includes the number of companies and individual establishments.



How are these SMEs involved in foreign markets through export and investment activities? Figure 3 presents destination shares of exports for three products: SME-type products, large firm-type products, and common-type products.<sup>2</sup> Close to 70 percent of exports of SME-type products, which are produced mainly by SMEs, go to Asian countries including China, Korea, ASEAN10, Hong Kong and Taiwan, and other parts of Asia. Combined with the fact that the corresponding share for large firm-type products is around 40 percent, it suggests that Japanese SMEs, in particular, are closely associated with Asian economies as suppliers of intermediate goods and/or final goods.

**Figure 3. Destination Shares of Exports for 3 Types of Products in 2007**



Data source: author's preparation, based on SME Agency (2009a).

Note: SME-type products (large firm-type products) are defined here as those with 70% or more of total sales by SMEs (large firms) in 2005. Common-type products are those not classified into either SME-type or large firm-type.

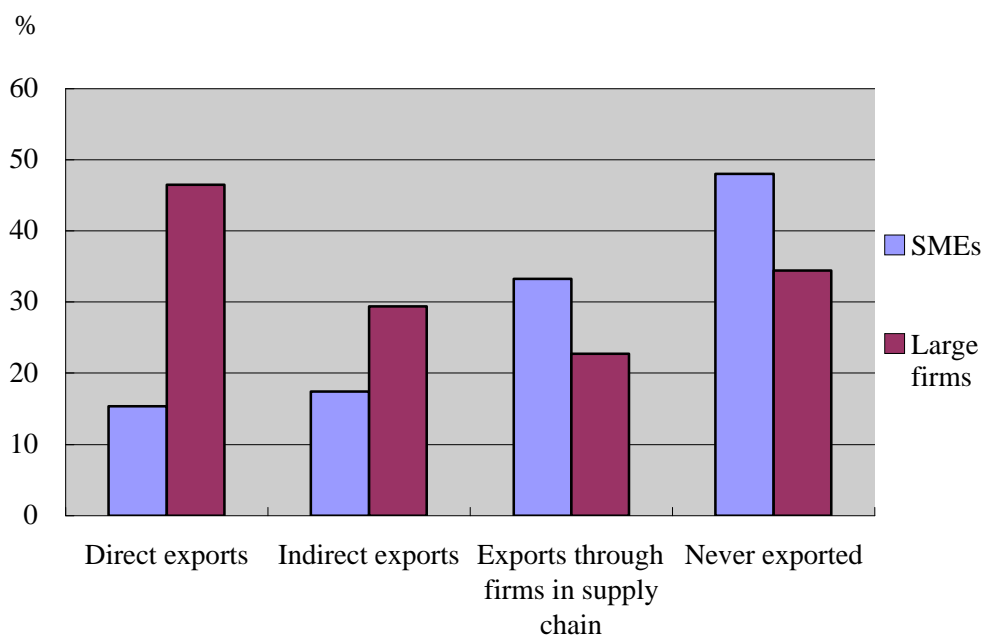
<sup>2</sup> SME-type products (large firm-type products) are defined here as those with 70% or more of total sales by SMEs (large firms) in 2005. Common-type products are those not classified into either SME-type or large firm-type.

Japanese SMEs do not necessarily export their products directly. In Figure 4, the forms of exports are distinguished among direct exports, indirect exports, and exports through firms in supply chains; direct exports are those that undertake customs clearance with the firm's own name, and indirect exports are those conducted by identified domestic trading companies, wholesalers, or export agencies. When products are not exported in any of these three forms, they are classified as the case of "never exported" in this figure. Figure 4 shows that 15 percent of SMEs in the survey export their products directly and 18 percent export indirectly, though they are much lower than in the case of large firms which have corresponding shares of 47 percent and 29 percent, respectively.<sup>3</sup> Moreover, one-third of SMEs supply their products to firms in their downstream who use those products to produce goods to be exported. As a consequence, almost half of SMEs in the survey are somehow involved in export activities (see the portion of "never exported"), and a significant portion of products produced by SMEs are likely to be sold to the market abroad in either way, directly, indirectly, or through business partners in supply chains.

---

<sup>3</sup> Multiple answers are allowed here.

**Figure 4. Form of Exports by SMEs and Large Firms**



Data source: SME Agency (2009a) (Original data source: Mitsubishi UFJ Research and Consulting Co., Ltd.(2008)).

Who are the partners of direct exports undertaken by Japanese SMEs? For large firms the major partners are local manufactures (52 percent), Japanese manufactures (45 percent), and local wholesalers (35 percent or 30 percent) (Table 2). On the other hand, the major partners for SMEs are local manufactures (42 percent) and local small and median sized wholesalers (30 percent), followed by Japanese manufactures in the local market (26 percent). This indicates that compared with large firms, Japanese SMEs are more likely to sell their products to indigenous firms including indigenous SMEs, rather than to Japanese firms in the local markets.

**Table 2. Partners of Direct Exports**

		SMEs	Large firms
Local	major wholesalers	11%	30%
	small and medium sized wholesalers	30%	35%
	retailers	12%	15%
	manufactures	43%	52%
	other traders	9%	15%
Japanese	major whosalers	5%	16%
	small and medium sized wholesalers	7%	10%
	retailers	1%	5%
	manufactures	26%	45%
	other traders	3%	4%
Others	8%	17%	

Data source: SME Agency (2009a) (Original data source: Mitsubishi UFJ Research and Consulting Co., Ltd.(2008)).

Notes: multiple answers are allowed. Firms with direct exports only.

Foreign exposure through investment by SMEs is also deeply associated with Asian countries, as is the case of exports. Table 3 demonstrates that most foreign affiliates of SMEs are located in Asia. In addition, over 60 percent of their majority owned affiliates in Asia are engaged in manufacturing activities, mainly in machinery sectors.

**Table 3. The Number of SMEs with Foreign Operations by Industry, 2007FY**

Industry	The number of firms	The number of firms with foreign operations		The number of majority-owned foreign affiliates			The number of minority-owned foreign affiliates			The number of foreign establishments/offices/factories		
		(% in total)	Total	Total		Total	Total		Total	Total		
				Asia	(% in total)		Asia	(% in total)		Asia	(% in total)	
Total	3,756,685	15,252	100.0	9,757	7,743	100.0	10,973	8,874	100.0	5,807	4,327	100.0
Manufacturing total	431,840	6,673	43.7	5,665	4,737	61.2	5,436	4,939	55.7	1,359	1,100	25.4
Food	39,922	448	2.9	152	123	1.6	875	865	9.7	137	115	2.7
Beverages, tabbaco, feed	5,873	39	0.3	32	31	0.4	6	6	0.1	—	—	n.a.
Textiles (excluding textile products)	21,550	165	1.1	110	110	1.4	83	83	0.9	31	31	0.7
Clothing, textile products	29,252	480	3.1	457	457	5.9	415	415	4.7	104	104	2.4
Lumber, wood products (excluding furniture)	13,990	35	0.2	42	40	0.5	4	3	0.0	—	—	n.a.
Furniture, furnishing	23,937	45	0.3	21	17	0.2	31	31	0.3	28	28	0.6
Pulp, paper, processed paper products	9,910	57	0.4	11	9	0.1	46	24	0.3	—	—	n.a.
Printing or other related business	33,890	171	1.1	215	177	2.3	128	128	1.4	43	34	0.8
Chemicals	4,776	355	2.3	411	372	4.8	406	406	4.6	92	92	2.1
Petroleum and coal products	424	3	0.0	3	3	0.0	—	—	n.a.	—	—	n.a.
Plastic products (excluding those listed elsewhere)	18,602	753	4.9	534	218	2.8	1,465	1,254	14.1	11	9	0.2
Rubber products	4,980	91	0.6	157	147	1.9	12	5	0.1	19	12	0.3
Hides and furs	6,224	91	0.6	21	21	0.3	175	175	2.0	—	—	—
Ceramics, earthenware	17,340	190	1.2	104	95	1.2	136	136	1.5	58	53	1.2
Iron and steel	5,039	80	0.5	100	73	0.9	20	20	0.2	—	—	n.a.
Non-ferrous metals	3,670	141	0.9	122	122	1.6	36	36	0.4	8	6	0.1
Metal products	58,432	679	4.4	561	561	7.2	326	326	3.7	—	—	n.a.
General machinery	54,711	1,102	7.2	989	855	11.0	552	410	4.6	149	140	3.2
Electrical machinery	15,009	358	2.3	238	238	3.1	172	123	1.4	61	7	0.2
Information-communications equipment	2,995	142	0.9	156	138	1.8	62	59	0.7	6	3	0.1
Electronic parts, devices	8,414	381	2.5	354	318	4.1	161	153	1.7	366	286	6.6
Transportation machinery	18,160	497	3.3	543	356	4.6	227	186	2.1	142	92	2.1
Precision machinery	8,305	131	0.9	106	62	0.8	24	21	0.2	37	22	0.5
Other manufacturing industries	26,436	240	1.6	227	196	2.5	72	72	0.8	65	65	1.5

Data source: author's calculation, based on SME Agency (2009b).

Note: The number of firms here includes the number of companies and private establishments.

The major reason for their FDI with a highest share is “reduction of production costs due to inexpensive labor forces etc” (52 percent), followed by “local procurement of products, parts, and raw materials” (47 percent) and “market expansion and sales promotion in the local market”(44 percent), for SMEs, while it is “market expansion and sales promotion in the local market” (69 percent) for large firms (Table 4)<sup>4</sup>. Moreover, although we cannot identify whether it is due to *Keiretsu* relationship or not, a quarter of SMEs with foreign operations in the survey go abroad to follow business partners’ entry into the foreign market, and 17 percent of those SMEs enter the foreign market according to the request of their business partners. These suggest that SMEs invest in foreign markets, mostly in Asia, in order to engage in manufacturing activities, contributing to the dense supporting industries in the production networks.

**Table 4. Reasons for Foreign Operations**

	SMEs	Large firms
Market expansion and sales promotion in the local market	44%	69%
Local procurement of products, parts, and raw materials	47%	33%
Gathering local information	21%	26%
Reduction of production costs due to inexpensive labor forces etc	52%	45%
Following to the business partners entering the foreign market	25%	31%
Request of entry to the foreign market from the business partners	17%	17%
Securing excellent human resources	6%	4%
Strengthening networks with local governments	1%	2%
Others	2%	3%

Data source: SME Agency (2009a) (Original data source: Mitsubishi UFJ Research and Consulting Co., Ltd. (2008)).

Note: firms with foreign operations only.

<sup>4</sup> Multiple answers seem to be applied, though it is not described in the original source.

Table 5 demonstrates what SMEs expect in order to expand into foreign markets to sell their products as well as their FDI. According to this table, the following factors including “reduction of tariffs on parts and final products” (52 percent), “strengthening protection of IPRs such as a crackdown on counterfeit goods” (43 percent), “ensuring security and safety” (41 percent), and “speedy procedures for trade and investment” (39 percent) seem to be effective measures for promoting foreign market expansion and FDI for SMEs.

**Table 5. Effective Measures to Promote Foreign Market Expansion and FDI for SMEs**

Reduction of tariffs on parts and final products	52%
Liberalization of services sectors and transparency of laws and regulations	20%
Strengthening protection of IPRs such as crackdown on counterfeit goods	43%
Improvement of harmonization and transparency of standards	20%
Non-discriminate and fair system of hosting investment	8%
Speedy procedures for trade and investment	39%
Avoiding dual taxation	23%
Avoiding dual social insurance	8%
Facilitation of procedures to obtain visa	11%
Development of infrastructure such as electricity, water supply, and roads	21%
Industrial cooperation through human resource development etc	17%
Ensuring security and safety	41%

Data source: SME Agency (2009) (Original data source: Mitsubishi UFJ Research and Consulting Co., Ltd.(2008)).

Note: multiple answers are applied.

Before moving to the next section, let us briefly review the voices of Japanese manufacturing firms on how they assess East Asia as a potential destination of their FDI

and what they regard as impediments in such countries for their FDI, although this survey basically covers both SMEs and large firms. The Japan Bank for International Cooperation (JBIC) annually conducts a questionnaire survey for Japanese manufacturing MNEs; one of the key questions of the survey is to list countries which they think are prospective destinations of their FDI in the short term (upcoming 3 years) and to summarize the reasons for their choice as well as the strong and weak points of such countries.<sup>5</sup> The results of the 2009 F/Y questionnaire survey show that China (selected by 353 firms out of 480) is by far the most important possible destination for their FDI, followed by other Asian countries; India (2<sup>nd</sup>, 278 firms), Vietnam (3<sup>rd</sup>, 149 firms), Thailand (4<sup>th</sup>, 110 firms), Indonesia (8<sup>th</sup>, 52 firms), Korea (9<sup>th</sup>, 31 firms), Malaysia (10<sup>th</sup>, 26 firms), Taiwan (11<sup>th</sup>, 21 firms), the Philippines (13<sup>th</sup>, 14 firms), and Singapore (18<sup>th</sup>, 7 firms) (Table 6).<sup>6</sup> It implies that many of the top 20 countries, particularly the top 10 countries, are East Asian countries.

---

<sup>5</sup> The 2009 F/Y questionnaire survey was conducted in July 2009 for Japanese firms with three or more foreign affiliates including at least one manufacturing foreign affiliate, in which 625 firms out of 1004 returned effective answers. The summarized report is available from the JBIC website, <http://www.jbic.go.jp/ja/about/press/2009/1106-01/index.html>.

<sup>6</sup> The corresponding countries for only SMEs with no more than 1 billions JP Yen are quite similar: China (1<sup>st</sup>, 80 firms out of 123), India (2<sup>nd</sup>, 67 firms), Vietnam (3<sup>rd</sup>, 45 firms), Thailand (4<sup>th</sup>, 38 firms), Indonesia (6<sup>th</sup>, 18 firms), and Malaysia (9<sup>th</sup>, 9 firms).



**Table 6. Strong and Weak Points of Prospective Destination Countries for Japanese Manufacturing FDI**

	Ranking <sup>a</sup>									
	1	2	3	4	5	6	7	7	9	10
Number of firms	353	278	149	110	103	95	65	52	31	26
Country	China	India	Vietnam	Thailand	Russia	Brazil	USA	Indonesia	Korea	Malaysia
<b>Strong points</b> <sup>b</sup>	348	275	149	103	95	95	64	50	30	26
	Percent									
Human capital	10	19	22	10	1	2	11	6	13	15
Inexpensive labor	44	39	58	42	8	15	-	46	-	39
Cheap parts and components / raw materials	20	10	7	11	3	5	2	8	7	8
To supply intermediate goods for assemblers	20	19	15	21	9	16	13	32	16	27
Agglomeration/industrial clusters	16	3	2	17	3	3	14	10	26	8
Risk diversion from other countries	1	5	19	10	1	1	-	6	-	8
To export to Japan	13	2	11	11	-	-	-	10	-	15
To export to the third countries	17	7	15	27	2	8	-	26	-	19
Advantage in local procurement	8	3	3	7	6	4	5	6	7	12
Present market size	33	19	9	25	18	18	69	22	58	12
Market potential	85	90	60	48	85	86	44	64	55	42
Rate of returns of market	9	4	3	7	6	3	14	14	13	4
R&D for the local market	3	1	2	4	-	-	11	2	7	-
Development of infrastructure	10	0	3	23	6	3	23	2	26	19
Development of logistics services	2	0	1	10	-	1	14	2	7	4
Investment incentives / deregulation measures	8	1	14	23	2	3	2	4	3	19
Stable policies such as foreign investment	3	3	5	13	-	-	2	2	-	12
Economic/social stability	4	4	11	9	5	5	27	4	23	27

<b>Weak points</b> <sup>e</sup>	336	260	136	104	99	88	60	48	31	24
	Percent									
Underdevelopment of legal system	16	17	24	6	15	10	-	13	-	4
Nontransparency in the legal system	56	29	31	6	33	22	-	27	-	4
Complicated taxation system	13	24	6	7	5	22	-	8	-	4
Nontransparency in the implementation of taxation system	32	22	16	8	16	14	-	21	3	13
Raised tax	21	8	6	11	3	2	7	10	7	8
Restrictions/regulations for foreign capital	25	12	15	15	11	13	-	6	7	4
Complicated and nontransparent administrative procedures for investment	20	14	11	7	22	16	-	8	-	8
Insufficient protection of IPRs	47	8	8	7	4	5	2	13	7	4
Restrictions/regulations on exchange rates and overseas remittance	38	13	13	9	11	8	-	6	10	4
Import restrictions and customs clearance	19	11	9	3	19	15	8	8	7	4
Insufficient human capital for engineering positions	7	10	20	16	11	10	13	25	7	29
Insufficient human capital for managerial positions	21	16	29	30	13	15	23	27	3	25
Rising labor costs in host country	56	17	27	27	12	11	5	27	23	21
Local labor problems	18	20	14	8	5	13	73	15	3	4
Harsh competition with other firms in the local market	50	30	10	39	21	21	-	19	55	17
Difficulty in collecting bill	28	7	4	4	12	3	-	-	-	8
Difficulty in local financing	9	6	3	-	5	6	-	4	-	0
Underdevelopment of indigenous supporting industries	4	12	18	2	6	5	-	10	-	4
Instability of local currency/pricing	3	5	13	6	12	15	-	19	23	-
Insufficient infrastructure	15	47	34	4	17	13	-	35	-	4
Instability of security and society	13	30	7	28	26	28	-	42	-	4
Insufficient information on the host country	2	20	15	4	25	23	-	10	-	13

a. The ranking is based on the number of Japanese manufacturing firms that chose the country as a prospective destination for their FDI in the short run.

b. The figures to the right are the number of Japanese manufacturing firms that answered the question on strong points among those that chose the country as a prospective destination for their FDI.

c. The figures to the right are the number of Japanese manufacturing firms that answered the question on weak points among those that chose the country as a prospective destination for their FDI.

d. This JBIC 2009 F/Y questionnaire survey was conducted in July 2009 for Japanese manufacturing firms with three or more foreign affiliates including at least one manufacturing foreign affiliate, in which 625 firms out of 1004 returned effective answers.

e. Multiple listings of destination countries are allowed.

Source: JBIC (2009).

The reasons for their choices show that “market potential” and “inexpensive labor” are important conditions that attract incoming FDI in most of the East Asian countries. More interestingly, factors related to vertical production chains or intra-regional trade such as “to supply intermediate goods for assemblers”, “to export to the third countries”, “to export to Japan”, and “agglomeration/industrial clustering” are also listed by many firms for most of the countries.<sup>7</sup> These imply that many Japanese manufacturing firms involve vertical production activities and form industrial clusters in East Asia, contributing to the formation of the international production/distribution networks.

Table 6 also presents what Japanese manufacturing firms view as weak points in each prospective destination for FDI. Many firms cite issues such as insufficient human capital for engineering/managerial positions, rising labor costs in host country, harsh competition, non-transparency in the legal system and in the implementation of taxation system, underdevelopment of legal system, restrictions/regulations for foreign capital, insufficient infrastructure, instability of security and society, insufficient information relating to the host country, and other such conditions as weak points of destination countries. The survey confirms that the development of human capital and physical infrastructure, transparency in legal systems and their implementation, particularly of tax-related regulations, and improvement of labor-related issues are key for hosting FDI. This is consistent with the results from another survey on Japanese firms shown in Table A.2 in the Appendix, which clearly presents the importance of further investment

---

<sup>7</sup> For instance, “to supply intermediate goods for assemblers” is selected by the 20 percent of the firms that list China as a prospective destination for their FDI, 19 percent for India, 15 percent for Vietnam, 21 percent for Thailand, 32 percent for Indonesia, and 27 percent for Malaysia.

facilitation to activate the investment of Japanese firms.

### **3. Japanese SMEs in International Production/Distribution Networks in East Asia**

This section investigates patterns of investment in East Asia by SMEs and globalizing patterns of Japanese firms including SMEs, with a particular emphasis on firms investing in East Asia and international production/distribution networks.<sup>8</sup> The analysis here is based on the firm-level statistics, which is conducted by the Ministry of Economy, Trade, and Industry (METI), Government of Japan: *The Basic Survey of Business Structure and Activity*. This database provides detailed information on (parent) firms located in Japan as well as the number, industry, and regional location of their foreign affiliates with not less than 20 percent Japanese ownership.<sup>9</sup> The samples in the survey covers firms with more than 50 workers, capital of more than 30 million yen, and establishments in mining, manufacturing, wholesale/retail trade, or restaurants.

Table 7 presents the number of SMEs with affiliates in East Asia/North America/Europe and the number of affiliates in East Asia/North America/Europe by the industry of parent firms and by the industry of affiliates.<sup>10</sup> In 2004, 4,590 out of 28,340 firms located in Japan (in the data set) have affiliates abroad, and 3,847 firms among these

---

<sup>8</sup> This section is based on Ando and Kimura (2010).

<sup>9</sup> Note that the location of foreign affiliates is not identified on the country basis; the questionnaires from *the 1997F/Y Basic Survey* include only East Asia, North America, and Europe as regional categories.

<sup>10</sup> SMEs are here defined as firms with regular workers of less than 300 in this section.

have affiliates in East Asia. When we focus only on SMEs, 1,948 out of 2,364 SMEs that have affiliates abroad have affiliates in East Asia. That is, over 80 percent of Japanese firms going abroad, regardless of whether they are large firms or SMEs, have at least one affiliate in East Asia.

**Table 7. Sectoral Patterns of Japanese Parent SMEs and Their Affiliates in East Asia for 2004**

Industry of parent firm	Number of parent SMEs	Number of affiliates by the industry of parent firm							
						Share by the industry of affiliate			
		(%)	(%)	Manufacturing (machinery)	Non-manufacturing (wholesales)	Manufacturing (machinery)	Non-manufacturing (wholesales)	Manufacturing (machinery)	Non-manufacturing (wholesales)
(a) East Asia									
Manufacturing	1,280	66%	1,962	62%	84%	(39%)	16%	(12%)	
-Machinery	534	27%	916	29%	82%	(76%)	18%	(14%)	
Non-manufacturing	668	34%	1,202	38%	35%	(9%)	65%	(55%)	
-Wholesales	528	27%	1,094	35%	36%	(9%)	64%	(60%)	
Total	1,948	100%	3,164	100%	65%	(28%)	35%	(28%)	
(b) North America									
Manufacturing	367	60%	386	61%	55%	(29%)	45%	(33%)	
-Machinery	195	32%	222	35%	50%	(47%)	50%	(40%)	
Non-manufacturing	249	40%	246	39%	11%	(6%)	89%	(66%)	
-Wholesales	176	29%	197	31%	13%	(7%)	87%	(78%)	
Total	616	100%	632	100%	38%	(20%)	62%	(46%)	
(c) Europe									
Manufacturing	128	56%	158	56%	48%	(17%)	52%	(43%)	
-Machinery	64	28%	88	31%	34%	(31%)	66%	(56%)	
Non-manufacturing	101	44%	125	44%	18%	(14%)	82%	(63%)	
-Wholesales	81	35%	114	40%	20%	(16%)	80%	(68%)	
Total	229	100%	283	100%	35%	(16%)	65%	(52%)	

Data source: Ando and Kimura (2010).

Note: The figures for "share" for manufacturing, machinery, non-manufacturing, and wholesales express the shares of manufacturing affiliates, machinery affiliates, non-manufacturing affiliates, and wholesales affiliates in total number of affiliates of SMEs in each sectoral category.

Japanese manufacturing parent firms, particularly machinery parent firms, are active investors in East Asia; close to 70 percent of the Japanese SMEs with affiliates in East Asia are in the manufacturing sector and over 40 percent of them are in machinery industries. Moreover, Japanese manufacturing affiliates, regardless of the industries of their parent SMEs, account for 65 percent of the total Japanese affiliates in the region, while it is 38 percent for North America and 35 percent for Europe. Interestingly, the proportion of manufacturing affiliates in East Asia with parent SMEs (65 percent) is higher than that of manufacturing affiliates in East Asia with all-sized parent firms (61%). This statistic indicates that Japanese SMEs are more likely to be deeply involved in manufacturing activities in East Asia.

A parent firm often conducts various types of operations at the same time and establishes foreign affiliates in order to conduct a subset of those activities. Japanese manufacturing parent SMEs have 84 percent of their total affiliates in East Asia in the manufacturing sector, which is higher than the corresponding portion for all-sized manufacturing parent firms (73 percent). Such investment patterns by SMEs reflect a typical strategy for firms involved in manufacturing activities which are aimed at supplying intermediate goods for other firms and/or for their own affiliates and forming a critical mass of industrial clusters in the manufacturing sector. Japanese manufacturing parent SMEs also have non-manufacturing affiliates in East Asia (16 percent of total affiliates of manufacturing firms), particularly in the wholesales sector (12 percent) to help establish distribution networks by internalizing wholesale trade activities.

In contrast to the case of East Asia, the share of manufacturing affiliates of

manufacturing parent SMEs is low, and the share of their non-manufacturing affiliates is as high as 45 percent for the case of North America and 52 percent for the case of Europe. It suggests that manufacturing investment in North America or Europe by Japanese firms, including SMEs, aims at selling their products or producing goods to be sold there, rather than being involved in dense vertical production chains as is the case in East Asia.

Table 8 presents globalizing patterns of Japanese manufacturing firms in the two-period balanced panel data for 1998-2004, where an increase in the number of foreign affiliates or affiliates in a specific region is regarded as the indication of globalizing activities. During the six years, 15 percent of manufacturing firms (nine percent of manufacturing SMEs) in the sample enlarge their activities abroad. Very close to these proportions, 14 percent of manufacturing firms (eight percent of manufacturing SMEs) in the sample expand their operations in East Asia, suggesting that most of the Japanese globalizing manufacturing firms including SMEs in the sample period enlarged their activities in East Asia. In addition, many firms that established their affiliates for the first time in East Asia during the sample period are SMEs; the share of SMEs in terms of the total number is 62 percent. Their active FDI in recent years also helped in the development of vertical production chains in the region.

**Table 8. Globalizing Patterns of Japanese Manufacturing Firms: Share by The Type of Firms**

The type of firms	World	East Asia	World	East Asia
	All sized firms		SMEs	
No entry in	74%	78%	84%	87%
Expansion in (i+ii)	15%	14%	9%	8%
- (i) Expansion in	8%	7%	3%	2%
- (ii) Expansion in (with 1st FDI in the region)	7%	7%	6%	6%
Steady in	7%	6%	5%	4%
Shrinkage in	3%	1%	1%	0%
Shrinkage in (withdrawal from the region)	2%	2%	2%	1%
Total	100%	100%	100%	100%

Source: Ando and Kimura (2010).

Note: world includes East Asia.

How Japanese manufacturing firms reorganize domestic operations while they globalize their activities? In the period 1998-2004, 63 percent of manufacturing firms in the balanced panel dataset reduce domestic employment, and aggregate employment in the domestic market drops too (Table 9). The shrinkage of employment has a gradual but steady trend in the manufacturing sector. Even in the manufacturing sector, however, the share of firms reducing domestic employment is relatively low (61 percent) and the average growth rate of domestic employment at the firms level is relatively high (0.0 percent) for firms expanding operations in East Asia (see figures for “Expansion in East Asia (i+ii)” in Table 9), particularly those starting operations in East Asia (by establishing their first affiliate in the region during the sample period) (55 percent and 0.057 percent, respectively), compared with those in other categories. In addition to this, firms establishing their first affiliates in East Asia during the sample period display an increase



in the number of domestic establishments and domestic affiliates as well, rather than diminishing domestic operations.

**Table 9. Changes in Domestic Operations of Japanese Manufacturing Firms from 1998 to 2004 by The Type of Firms**

The type of firms	Domestic employment			Domestic establishments		Domestic affiliates	
	Share of firms with reduction	Average growth rates at the firm level	Aggregate change	Share of firms with reduction	Aggregate change	Share of firms with reduction	Aggregate change
<b>Manufacturing firms</b>							
No entry in East Asia	63%	-0.021	-111,204	26%	1,860	15%	-571
Expansion in East Asia (i+ii)	61%	0.000	-181,593	40%	-627	31%	437
- (i) Expansion in East Asia	66%	-0.057	-171,659	50%	-775	41%	-143
- (ii) Expansion in East Asia (with 1st FDI in the region)	55%	0.057	-9,934	31%	148	22%	580
Steady in East Asia	69%	-0.076	-46,325	37%	119	34%	-442
Shrinkage in East Asia	74%	-0.085	-64,814	51%	-330	56%	-974
Shrinkage in East Asia (withdrawal from the region)	75%	-0.163	-28,045	41%	-97	47%	-343
Total	63%	-0.025	-431,981	29%	925	20%	-1,893
<b>Manufacturing SMEs</b>							
No entry in East Asia	61%	-0.007	-23,291	23%	527	14%	-394
Expansion in East Asia (i+ii)	51%	0.087	6,906	26%	129	20%	65
- (i) Expansion in East Asia	56%	0.031	696	34%	-26	23%	-14
- (ii) Expansion in East Asia (with 1st FDI in the region)	49%	0.108	6,210	23%	155	18%	79
Steady in East Asia	62%	-0.037	-2,588	29%	-45	24%	-53
Shrinkage in East Asia	67%	0.070	199	33%	8	30%	-6
Shrinkage in East Asia (withdrawal from the region)	69%	-0.103	-1,813	35%	-17	34%	-39
Total	60%	-0.002	-20,587	24%	602	15%	-427

Source: Ando and Kimura (2010).

Notes: The two-period balanced panel data is used. Industry classification and firm size are based on data for 1998.

Such patterns emerge even more clearly for manufacturing SMEs. The share of firms reducing domestic employment is much lower for manufacturing SMEs expanding operations in East Asia than for those not expanding activities in East Asia; the ratios are 51 percent for SMEs expanding operations in East Asia (56 percent for those expanding further and 49 percent for those with the first FDI in the region) while it is 61 percent for

those with no entry, 67 percent for those shrinking, 69 percent for those with exit, and 62 percent for those remaining. Furthermore, manufacturing SMEs expanding operations in East Asia have much higher average growth rates of domestic employment and indeed contribute to net domestic job creation at the aggregate level.

Table 10 presents the results of logit/OLS estimation analyses for manufacturing firms and machinery firms. It demonstrates that larger firms tend to reduce domestic employment. On the other hand, given the size of firm and other controls, globalizing manufacturing firms are unlikely to reduce their domestic employment and tend rather to increase the number, compared with other manufacturing firms (see coefficients for “expansion in East Asia”). Such a tendency is salient for machinery firms who are one of the active players in international production/distribution networks, mainly in the machinery sectors in East Asia. Furthermore, globalizing manufacturing firms, particularly globalizing machinery firms, in East Asia intensify export/import activities within East Asia while sometimes restructuring domestic activities in terms of the number of domestic establishment and domestic affiliates, compared with other firms. All of the above-mentioned features obtained from descriptive and quantitative analysis indicate that intensified globalizing activities of Japanese manufacturing firms through FDI in East Asia seem to be complements of domestic operations, rather than substitutes, and contribute to the further development of production/distribution networks in the region (see Figure 5 for an illustrates an example of complementary operations).<sup>11</sup>

---

<sup>11</sup> When a firm realizes cost reduction by fragmentation with FDI in lower income countries, it may be able to sell more products at cheaper prices than before. Larger sales requires an increase in the production of both final goods and intermediate inputs including specialized parts and components

**Table 10. Production Networking in East Asian and Domestic Operations in 1998-2004**

Independent variables	Dependent variable					
	(1) d. employment [logit]	(2) d. employment [OLS]	(3) d. establishment [logit]	(4) d. affiliates [logit]	(5) exports to E.Asia [OLS]	(6) imports from E.Asia [OLS]
<b>a) manufacturing firms</b>						
Constant	1.351 *** (0.196)	0.315 *** (0.035)	3.369 *** (0.198)	4.709 *** (0.228)	0.003 (0.005)	0.017 ** (0.008)
Expansion in East Asia (incl. new entry)	0.415 *** (0.067)	0.084 *** (0.012)	-0.088 (0.069)	-0.090 (0.075)	0.028 *** (0.002)	0.032 *** (0.003)
Firm size	-0.421 *** (0.026)	-0.069 *** (0.004)	-0.497 *** (0.026)	-0.543 *** (0.028)	0.000 (0.001)	-0.002 * (0.001)
Capital-labor ratio	0.085 *** (0.023)	0.015 *** (0.004)	-0.053 ** (0.024)	-0.213 *** (0.030)	-0.0001 (0.001)	0.000 (0.001)
Foreign sales ratio	0.246 (0.242)	-0.063 (0.044)	-0.503 ** (0.245)	-0.635 ** (0.264)	0.027 *** (0.006)	0.041 *** (0.011)
In-house R&D ratio	3.341 *** (1.093)	0.546 *** (0.189)	-0.867 (1.149)	-0.863 (1.297)	0.095 *** (0.028)	0.011 (0.049)
Advertisement ratio	-1.101 (1.430)	0.352 (0.252)	-4.147 *** (1.379)	-4.690 *** (1.471)	-0.040 (0.035)	-0.049 (0.059)
Foreign capital ratio	0.00041 * (0.000)	0.00007 * (0.000)	0.00011 (0.000)	0.00153 *** (0.000)	0.00001 (0.000)	0.00356 (0.062)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Log likelihood	-6495		-5832		-4700	
Adj R2	0.034				0.056	
Number of observations	10218		10218		10036	
<b>b) machinery firms</b>						
Constant	1.744 *** (0.234)	0.327 *** (0.041)	3.325 *** (0.244)	4.994 *** (0.287)	0.004 (0.008)	0.020 * (0.012)
Expansion in East Asia (incl. new entry)	0.409 *** (0.094)	0.069 *** (0.017)	-0.094 (0.097)	-0.007 (0.110)	0.033 *** (0.003)	0.030 *** (0.005)
Firm size	-0.419 *** (0.040)	-0.065 *** (0.007)	-0.372 *** (0.039)	-0.551 *** (0.045)	0.002 (0.001)	0.001 (0.002)
Capital-labor ratio	0.091 ** (0.038)	0.013 * (0.007)	-0.052 (0.042)	-0.136 *** (0.052)	0.0009 (0.001)	0.002 (0.002)
Foreign sales ratio	0.183 (0.288)	-0.087 * (0.053)	-0.595 ** (0.287)	-0.739 ** (0.313)	0.030 *** (0.010)	0.057 *** (0.015)
In-house R&D ratio	2.583 * (1.418)	0.632 ** (0.264)	-2.334 (1.451)	-1.571 (1.684)	0.086 * (0.050)	-0.102 (0.076)
Advertisement ratio	-0.945 (6.108)	-0.432 (1.135)	-14.694 ** (6.231)	-19.346 *** (6.784)	-0.091 (0.214)	0.250 (0.327)
Foreign capital ratio	0.00048 (0.000)	0.00007 (0.000)	0.00019 (0.000)	0.00129 ** (0.001)	0.00001 (0.000)	0.00002 (0.000)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Log likelihood	-2487		-2228		-1745	
Adj R2	0.035				0.048	
Number of observations	3903		3903		3846	

Data source: Ando and Kimura (2010).

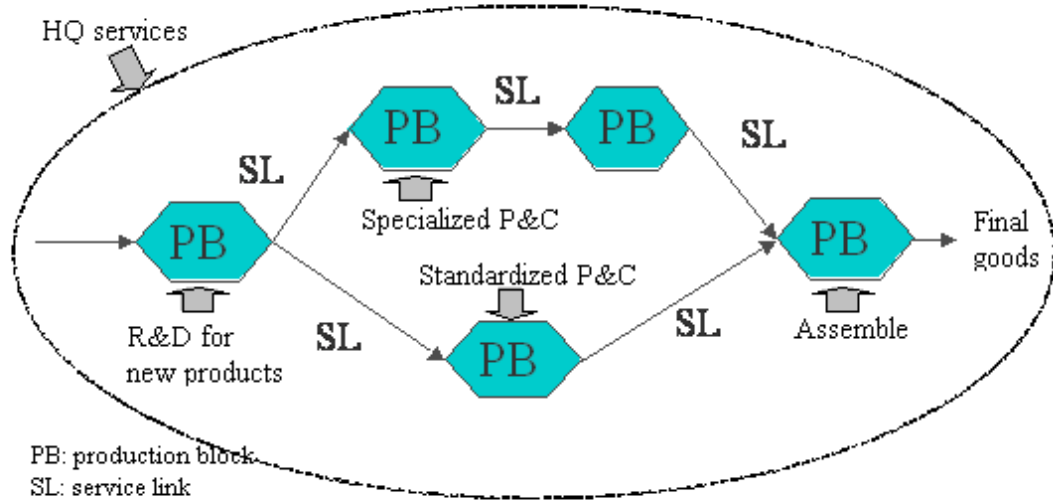
Notes: figures in parenthesis are standard deviation. \*\*\* indicates that the results are statistically significant at the 1 percent level, \*\* at the 5 percent level, and \* at the 10 percent level. Regressions are as follows:

- (1) dependent variable: 1 if a firm does not reduce the number of domestic employments and 0 otherwise
- (2) dependent variable: growth rate of the number of domestic employment
- (3) dependent variable: 1 if a firm does not reduce the number of domestic establishments and 0 otherwise
- (4) dependent variable: 1 if a firm does not reduce the number of domestic affiliates and 0 otherwise
- (5) dependent variable: a change in the ratio of exports to East Asia in total sales
- (6) dependent variable: a change in the ratio of imports from East Asia in total purchases

(P&C), as well as larger research and development (R&D) activities for new products and more extensive headquarter (HQ) services. If the firm shifts home activities to those that are complementary to activities abroad in the production networks, it would rather expand domestic employment even if it might reduce employment on assembly lines.

**Figure 5. Complementary Operations with Fragmentation: an Illustration**

Figure 5 Complementary operations with fragmentation: an illustration



Source: Ando and Kimura (2010).

At the end of this section, let us discuss some of the features of transactions by Japanese machinery firms in East Asia, based on another METI database. Table 11 presents shares of (a) by-destination sales in total sales and those of (b) by-origin purchases in total purchases by Japanese machinery affiliates in East Asia (total), NIEs4, ASEAN4, and China, with a distinction between intra-firm transactions and arm’s length transactions at each destination/origin. Two interesting insights emerge. Firstly, their transactions with other East Asian countries (i.e. East Asian countries other than Japan and the host country) have increased relatively on both the sales and purchases sides, which implies the development of production networks in the 1990s. More precisely, most of the sales and purchases by Japanese affiliates in East Asia are transactions among Japan, local market, and other East Asian countries. In addition, the shares of transactions with other East Asian countries tend to become larger over time; in the case of the machinery industry, such transactions were 20 percent of sales and purchases in 2001, up from nine percent of sales and eight percent of purchases in 1992. Combined with an

explosive increase in the value of transactions, these suggest the presence and development of strong intra-regional production networks involving not only the local market but also other East Asian countries through back-and-forth transactions of intermediate goods.

**Table 11. Intra-firm and Arm's Length Transactions by Japanese Machinery Affairs in East Asia**

	East Asia		NIES4		ASEAN4		China	
	1992	2001	1992	2001	1992	2001	1992	2001
<b>Number of affiliates</b>	715	2,121	343	644	286	791	54	552
<b>(a) Sales</b>								
<b>Values (billion JPY)</b>	5,202	14,826	2,770	5,213	2,125	6,399	114	2,427
<b>Share in total by destination (%)</b>								
(i) <b>Japan</b>	<b>17</b>	<b>29</b>	<b>19</b>	<b>31</b>	<b>15</b>	<b>30</b>	<b>40</b>	<b>30</b>
Intra-firm	15	23	18	20	13	27	40	25
Arm's length	2	6	1	10	2	4	0	5
(ii) <b>Local</b>	<b>66</b>	<b>40</b>	<b>64</b>	<b>44</b>	<b>66</b>	<b>31</b>	<b>46</b>	<b>45</b>
Intra-firm	5	5	4	5	7	7	0	4
Arm's length	61	35	60	40	59	23	46	41
(iii) <b>Other East Asia</b>	<b>9</b>	<b>20</b>	<b>10</b>	<b>14</b>	<b>10</b>	<b>25</b>	<b>11</b>	<b>18</b>
Intra-firm	5	10	3	7	7	12	11	15
Arm's length	4	10	7	8	2	13	0	4
(i+ii+iii) <b>East Asia (total)</b>	<b>92</b>	<b>89</b>	<b>93</b>	<b>89</b>	<b>91</b>	<b>86</b>	<b>97</b>	<b>93</b>
Intra-firm	25	39	25	32	27	46	51	44
Arm's length	67	50	68	58	64	40	46	49
<b>(b) Purchases</b>								
<b>Values (billion JPY)</b>	2,466	10,417	1,140	3,733	1,204	4,560	54	1,626
<b>Share in total by origin (%)</b>								
(i) <b>Japan</b>	<b>46</b>	<b>38</b>	<b>47</b>	<b>40</b>	<b>44</b>	<b>36</b>	<b>76</b>	<b>38</b>
Intra-firm	39	27	39	32	39	23	71	24
Arm's length	7	11	9	8	5	13	5	14
(ii) <b>Local</b>	<b>43</b>	<b>40</b>	<b>42</b>	<b>38</b>	<b>45</b>	<b>41</b>	<b>21</b>	<b>43</b>
Intra-firm	1	4	1	3	1	5	5	3
Arm's length	43	36	41	34	44	35	16	40
(iii) <b>Other East Asia</b>	<b>8</b>	<b>20</b>	<b>10</b>	<b>21</b>	<b>8</b>	<b>22</b>	<b>2</b>	<b>18</b>
Intra-firm	5	9	9	11	2	8	2	12
Arm's length	3	11	1	10	6	14	0	6
(i+ii+iii) <b>East Asia (total)</b>	<b>98</b>	<b>99</b>	<b>99</b>	<b>99</b>	<b>97</b>	<b>98</b>	<b>98</b>	<b>99</b>
Intra-firm	45	40	48	46	42	36	78	39
Arm's length	53	59	51	53	56	62	20	60

Data source: author's preparation, based on Ando and Kimura (2006).

Note: Figures for 'Share in total by destination/origin' express sales to/purchases from each destination/origin as a percentage of total sales/purchases by Japanese affiliates in corresponding regions/countries.

Secondly, arm's length transactions have been more actively utilized than before,

reflecting development of agglomeration and supporting industry. As the table shows, arm's length transactions have been performed more often than before, particularly when selling goods to/purchasing goods from Japan and other East Asian countries. In addition, purchases from Japan tend to be shifted to intra-firm and arm's length purchases from other East Asian countries. Purchases from Japan by Japanese machinery affiliates in China, above all, seem to be replaced by arm's length purchases in the local market as well as intra-firm and arm's length purchases from other East Asian countries. While intra-firm purchases from Japan as a percentage of total purchases by Japanese machinery affiliates in China decreased from 71 percent in 1992 to 24 percent in 2001, arm's length purchases in the local market increased from 16 percent in 1992 to 40 percent in 2001, eventually reaching the level of ASEAN4/NIES4 in terms of share of arm's length purchases in the local market and that of local purchases in total. Considering the fact that operations by Japanese firms in China seriously started in the latter half of the 1990s, such a rapid shift suggests the formation of local vertical links in agglomeration in China, reflecting the lowering of service link costs as well as more developed industrial clusters involving MNEs and indigenous firms becoming more competitive than before. Although it is still often too much emphasized that the activities of Japanese MNEs depends heavily on *Keiretsu* or *Shitauke* relationships, firms in East Asia, including Japanese firms, have been effectively utilizing both intra-firm and arm's length transactions.

#### 4. Economic and Policy Environment for SMEs<sup>12</sup>

Up to the 1980s, an important component of the Japanese economic system was the subcontracting system (*shitauke* in Japanese) or long-term relationships between large downstream assemblers and upstream SMEs. However, the inter-firm relationship of Japanese firms has drastically changed since Japanese firms started to actively conduct FDI in the mid-1980s. It is often observed that both large assemblers and SMEs partake in FDI together to form a certain size of agglomeration in Southeast Asia or China. Even in such cases, upstream-downstream relationships become more competitive, non-exclusive ones. With strict cost consideration, many Japanese firms are now open to extend their production chains to firms with other nationalities, as long as the technological level meets demand. Thus, going abroad provided good opportunities to nullify the old inefficient subcontracting system and to construct new inter-firm relationships with improved efficiency. This was a type of mechanism for accelerating efficient turnovers of SMEs.

At the same time, outward FDI by larger-sized assemblers activated a self-selection mechanism for smaller-sized suppliers of parts and components, initially connected with assemblers in the long-term subcontracting system, forcing them to decide whether or not they would go abroad with large assemblers. As a result, competitive SMEs went abroad, while weak ones could not. Through such a mechanism, FDI by competitive Japanese SMEs became an essential part of East Asia's international production/distribution

---

<sup>12</sup> See also Ando and Kimura (2005) and Kimura and Ando (2006).

networks.

Let us take a success story of overseas activities by competitive SMEs; a success in developing its market abroad through local productions of high value added products (SME Agency, 2009a). Kyoshin Kogyo Co., Ltd is a small and medium sized parts supplier; its main products are pressed and resin molded goods, such as tab and tapping terminals that are used as input terminals mounted on printed circuit boards for home appliances and car electronics. Besides having three factories in Japan, it set up a plant in the Tan Thuan export processing zone (EPZ) in Vietnam utilizing the advantage of EPZ in 1995, and established a sales office in Singapore. The trigger for its investment in Vietnam was the overseas presence of its business partners, numbering in as many as 700 Japanese companies. Although firms in general would tend to produce labor-intensive products thereby making use of the inexpensive labor force in Vietnam, Kyoshin Kogyo attempted to specialize in parts requiring high-level technology, to which other firms face difficulties in catching up. Since it supplies parts requiring high-level technology, which are thought to be impossible to purchase within Vietnam, it could expand the market. As a result, 40 percent of its products manufactured at the Vietnam plant are sold in the local market, 30 percent are exported to Japan, and the remaining 30 percent are exported to other countries such as Thailand, Malaysia, Singapore, China, and Hong Kong.

The Japanese Government has consistently supported, both explicitly and implicitly, outward FDI by Japanese firms. In particular, FDI facilitation measures for SMEs have been important because they had not necessarily been experienced players in the arena of global operations. Government's support for outward FDI consisted of three policy lines.



First, the government provided mildly concessionary financing arrangements for outward FDI through governmental financial institutions such as the Export-Import Bank (currently Japan Bank for International Cooperation (JBIC)) and Japan Finance Corporation for Small Business. The concessionarity itself, which conformed to OECD guidelines and other international norms, was probably not very important; rather, such financing was used to encourage private financial institutions to co-finance the main portion of investment through reducing information-gathering cost. Second, Japan External Trade Organization (JETRO) and industrial organizations played an important role in helping investing firms to gather necessary local information and facilitate investment. Although not in the governmental sector, general trading companies (GTCs) also worked as important channels to facilitate investment; they sometimes even constructed and managed industrial estates in East Asian countries. Third, though not necessarily planned and implemented on purpose, the Japanese ODA program and other economic/technical cooperation were active in fostering supporting industries in host countries, indirectly helping Japanese FDI.

## **5. Conclusion**

This paper has attempted to investigate the mechanisms and features of the development of international production/distribution networks in East Asia, focusing on SMEs, from the viewpoint of one of the major players in the regional production

networks. Our analysis demonstrates that active FDI in vertical supply chains by SMEs, particularly in recent years, contributes to the formation of agglomeration and industrial clusters and further development of the networks in East Asia. Our analysis also demonstrates that competitive SMEs are likely to expand their operations both domestically and internationally, mainly in East Asia, by effectively being involved in the production/distribution networks in the region.

To further develop international production networks and to deeply involve SMEs in the networks, various facilitation measures are important for both hosting and investing countries. On the host country side, besides reduction of tariffs on parts and final products, factors such as strengthening protection of IPRs, ensuring security and safety, and speedy procedures for trade and investment seem to be effective measures to help promote foreign market expansion and FDI for SMEs. Moreover, regardless of whether large firms or SMEs, the development of human capital and physical infrastructure, transparency in legal systems and their implementation, particularly of tax-related regulations, and improvement of labor-related issues are keys for hosting FDI. On the investing side, providing various financing arrangements would help SMEs seeking investment to obtain financial resources. Furthermore, an assistance of investing firms, particularly investing SMEs, in gathering necessary local information is crucial to facilitate investment. All of these efforts from various different angles for both hosting and investing countries should encourage SMEs to be an essential part of East Asia's international production/distribution networks, and thereby assist in strengthening their competitiveness by effectively being involved in these networks.

## References

- Ando, Mitsuyo and Fukunari Kimura (2005) “The Formation of International Production and Distribution Networks in East Asia”. In *International Trade (NBER-East Asia Seminar on Economics, Volume 14)*, eds. Takatoshi Ito and Andrew Rose. Chicago: The University of Chicago Press.
- Ando, Mitsuyo and Fukunari Kimura (2006) “Fragmentation in East Asia: Further Evidence,” *KUMQRP Discussion Paper* No. 2006-23. The revised version is forthcoming in Prema-chandra Athukorala eds. (2010) *The Rise of Asia: Trade and Investment in Global Perspective*.
- Ando, Mitsuyo and Fukunari Kimura (2010) “International Production/Distribution Networks in East Asia and Domestic Operations: Evidence from Japanese Firms,” Forthcoming in Robert M. Stern (ed.) *Quantitative Analysis of Newly Evolving Patterns of International Trade: Fragmentation; Offshoring of Activities; and Vertical Intra-Industry Trade*. World Scientific Studies in International Economics.
- Bank of Japan (2010) “Direct Investment Position,” Available from [http://www.stat-search.boj.or.jp/index\\_en.html](http://www.stat-search.boj.or.jp/index_en.html)
- Kimura, Fukunari and Mitsuyo Ando (2006) “Japanese Manufacturing FDI and International Production and Distribution Networks in East Asia”. In *Multinationals and Economic Growth in East Asia: Foreign Direct Investment, Corporate Strategies And National Economic Development*, eds. Shujiro Urata, Siow Yue Chia and Fukunari Kimura. Routledge.
- Mitsubishi UFJ Research and Consulting Co., Ltd. (2008) “Survey on Market and Intellectual Property Rights Strategies.”
- Small and Medium Enterprise Agency (2009a) White Paper on Small and Medium Enterprises in Japan.
- Small and Medium Enterprise Agency (2009b) Basic Survey of Small and Medium Enterprises 2009. Available from

<http://www.e-stat.go.jp/SG1/estat/List.do?lid=000001055815>.

Urata, Shujiro and Mitsuyo Ando (2009) “Investment Climate Study on ASEAN Member Countries.” In. (2009) Deepening East Asian Economic Integration ERIA research project report 2008 No.1. eds. Jenny Corbett and So Umezaki Available from <http://www.eria.org/research/y2008-no1.html>.

Table A.1 Outline of the Small and Medium Enterprise Basic Law

The Previous Small and Medium Enterprise Basic Law			The New Small and Medium Enterprise Basic Law			
[ Policy Concept ]	Rectify the Gap between LE & SMEs in terms of productivity		Developing and growing a wide range of independent SMEs for greater economic vitality ( Expectation of SMEs ) - Creation of New Business - Promotion of Market Competition - Increase of Attractive Job Opportunities - Vitalization of Regional Economy			
[ Policy System ]	<b>Upgrading in Structure of SMEs (Improving Productivity)</b> - Modernization of Facilities - Improvement of Technology - Rationalization of Business Management - Optimization of Corporate Scale - Arrangement of Joint Operation for Business - Commercial and Services Sectors - Change of Business - Labor Related Policies  <b>Rectification of Disadvantages (Improving Trading Conditions)</b> - Prevention of Excessive Competition - Rationalization of Transaction with Subcontracting - Securing Opportunities of Business Activities - Ensuring Opportunities for Procurement of Receiving Orders from Government etc. - Export Promotion - Coordination of Relation with Import Goods  <b>Finance and Taxation (Common Policy Tools)</b> Facilitating Appropriate Fund Lending Enhancement of Business Capital, and Optimizing Tax Burden  Consideration for Small-Scale enterprises		<b>Supporting Self-help Efforts for Business Innovation and Start-ups (Support for Ambitious Enterprises)</b> - Promoting Business Innovation (Support for Technology, Equipment, Intangible Management Resources, etc.) - Promoting Start-ups (Information Services, Training, Programs, Facilitating Fund Supply, etc.) - Promotion of Venture (R&D, Supportive Human Resources, Fund Raising through Stocks, Bonds, etc.)  <b>Strengthening of Management Base (Enhancement of Management Resources)</b> - Ensuring Managerial Resources Equipment Technology (SBIR, Collaboration among Ind., Univ. and Gov., etc.) Human Resources, Information Establishing Core Support Center, etc. - Facilitating Collaboration and Joint Operation - Vitalization of Industrial and Commercial Agglomeration - Labor Related Policies - Rationalization of Transaction - Ensuring Opportunities for Procurement of Receiving Orders from Government etc.  <b>Facilitating Apt Responses by Enterprise for Abrupt Environmental Change (Providing Necessary Safety Net)</b> Stabilizing Business Management and Facilitating Change of Business, etc. Provision of Mutual Relief System, and Legal System of Bankruptcy  <b>Finance and Taxation (Common Measures)</b> Facilitating Fund Supply Enhancement of its Capital in Enterprise, and Optimizing Tax Burden => Establishing Various Ways to Supply Fund including Direct Financing  Consideration for Small-Scale enterprises			
[ Definition ]	Industries	Capital Size (million yen)	Number of regular workers	Industries	Capital size (million yen)	Number of regular workers
	Manufacturing and Others	100 or less	300 or less	Manufacturing and Others	300 or less	300 or less
	Wholesale	30 or less	100 or less	Wholesale	100 or less	100 or less
	Retail	10 or less	50 or less	Retail	50 or less	50 or less
	Services	10 or less	50 or less	Services	50 or less	100 or less

Source: the website of small and medium enterprise agency ([http://www.chusho.meti.go.jp/sme\\_english/outline/02/01.html](http://www.chusho.meti.go.jp/sme_english/outline/02/01.html)).

Table A.2 Investment climate in ASEAN10 economies in 2008: the number of incidents by category and country

	Brunei	Cambodia	Indonesia	Laos	Malaysia	Myanmar	Philippines	Singapore	Thailand	Viet Nam	Total	Share by category (%)
<b>(a) The number of Japanese affiliates in each country</b>	<b>1</b>	<b>10</b>	<b>659</b>	<b>6</b>	<b>759</b>	<b>10</b>	<b>419</b>	<b>991</b>	<b>1,577</b>	<b>332</b>	<b>4,764</b>	
<b>(b) Issues to be solved for FDI liberalization and facilitation</b>												
<b><u>FDI liberalization</u></b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>0</b>	<b>11</b>	<b>7</b>	<b>9</b>	<b>1</b>	<b>15</b>	<b>9</b>	<b>66</b>	<b>21%</b>
i) Restrictions on foreign entry	0	0	10	0	5	2	6	0	8	4	35	11%
ii) Performance requirements	0	0	2	0	3	0	0	0	2	2	9	3%
iii) Restrictions on overseas remittances and controls on foreign currency transactions	0	0	0	0	1	5	2	0	3	2	13	4%
iv) Restrictions on the movement of people and employment requirements	0	0	2	0	2	0	1	1	2	1	9	3%
<b><u>FDI facilitation</u></b>	<b>0</b>	<b>16</b>	<b>28</b>	<b>4</b>	<b>33</b>	<b>21</b>	<b>48</b>	<b>6</b>	<b>45</b>	<b>49</b>	<b>250</b>	<b>79%</b>
v) Lack of transparency in policies and regulations concerning investment (institutional problems)	0	5	5	1	8	8	11	0	14	12	64	20%
vi) Complicated and/or delayed procedures with respect to investment-related regulations (implementation problems)	0	5	11	1	10	7	16	0	20	18	88	28%
vii) Insufficient protection of intellectual property rights	0	0	2	0	3	0	3	0	2	1	11	3%
viii) Labor regulations and related practices excessively favorable to workers	0	0	2	0	5	0	10	3	3	4	27	9%
ix) Underdeveloped infrastructure, shortages of human resources, and insufficient investment incentives	0	6	6	2	7	5	8	3	5	11	53	17%
x) Restricted competition and price controls	0	0	2	0	0	1	0	0	1	3	7	2%
<b>Total</b>	<b>0</b>	<b>16</b>	<b>42</b>	<b>4</b>	<b>44</b>	<b>28</b>	<b>57</b>	<b>7</b>	<b>60</b>	<b>58</b>	<b>316</b>	<b>100%</b>

Source: Urata and Ando (2009).

Note: see the original source for the details.