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Integrating SMEs into Global Value Chains: Policy Principles and Best Practices

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EXECUTIVE SUMMARY

With global value chains (GVCs) playing a prominent role in the international trading system, integrating SMEs into GVCs brings benefits, but also faces challenges. The analysis of GVCs in the agriculture, food processing, automobile, electronics, and handicraft sectors shows heterogeneity exists among them, in terms of value chain configuration and characteristics.

This study follows a qualitative analysis that identifies the strengths, weaknesses, opportunities and threats (SWOT) for small and medium enterprises (SMEs) in the Asia-Pacific Economic Cooperation (APEC) region to participate in the value chains of five selected sectors. Due to the features and challenges pertaining to each sector, it is hard to suggest a list of 'one size fits all' policies to facilitate the participation of SMEs in GVCs. Instead, this study suggests some policy principles and best practices to increase the chances for SMEs to play an important role in GVCs.

Global value chains

'Integration of trade' and 'disintegration of production' are becoming concurrent phenomena. Currently, around 80 percent of global trade is conducted through global value chain networks. Despite the slowdown in 2008 and 2009 because of the global financial crisis, global value chains remain at the center of the world trade stage.

Since the global financial crisis, among the structural changes that are taking place in global value chains, the following are identified: 1) GVCs are experiencing consolidation, with multinational corporations (MNCs) sourcing from a few large and competent suppliers rather than a large number of smaller suppliers; 2) synergies are emerging among different value chains, and a convergence of lower-tier suppliers is taking place; 3) as production costs are starting to rise in developing Asia, some MNCs based in developed economies are re-shoring some operations; 4) globally, major consumer markets are shifting to developing economies, pushing geographical expansion of the value chains; 5) trade in services is taking a more prominent role, linking different players along the chains; and 6) the rise of e-commerce is enabling a further expansion of global value chains.

SMEs in Global Value Chains: Analysis of Five Selected Sectors

In GVCs, SMEs are seen as suppliers providing intermediate input, often acting as subcontractors several levels down from the ultimate buyer. The APEC SME Working Group selected the agriculture, food processing, automobile, electronics, and handicraft sectors as key sectors where SMEs have interest in participating in GVCs (APEC Project Database 2012). Organized and governed by different types of lead firms, the five GVCs exhibit different features:

- The **agriculture global value chain** is led by large wholesalers and retailers, and in certain cases, development agencies and non-profit organizations. Standards on safety, quality, size, shape and timely delivery are important and prevalent in this chain. Also, due to high perishability of agricultural products, investments are focusing on cold chain management and transportation.
- The **food processing global value chain** is led by multinational food companies. As competition among lead firms increasingly lies in product differentiation and satisfaction of premium-paying consumers, it is moving towards consolidation. Although private food standards are growing in numbers and significance, food safety, food waste and food losses are prominent concerns.

- The **automobile global value chain** has a few influential lead firms. Consolidation in this sector started as early as in the mid-1980s. Unlike other global value chains, the automobile value chain always centers in or clusters around major markets, which are mostly developed economies. Since millennium, the rise of developing economies is evident, with automakers in developing economies gaining market power and car purchases growing exponentially.
- The **electronics global value chain** has the most extensive geographical coverage. Multinational manufacturers are the lead firms in this chain. Contract manufacturers prevail in the electronics value chain, and large global suppliers provide lead firms with one-stop shopping solutions. A feature in the electronics market is that branded products are mostly sold in developed economies, while low-cost white-label products are becoming very popular in developing economies.
- The **handicraft global value chain** is expanding strongly. Production agents are gaining market power and becoming the intrinsic lead firms. China and India, together with other Asian economies, are the major producers of handicraft products, and their position is likely to be strengthened. E-commerce plays a significant role in handicraft distribution.

Generally, MNCs set the 'rules of the game' in global value chains, and govern a multitude of SME suppliers. This paper discusses five governance structures: market, modular, relational, captive, and hierarchical. Although the five structures reflect distinct strategies, in reality, value chains are more complex, and show complicated configurations with combinations of several governance structures.

Before entering into a business relationship, MNCs will assess the SME suppliers on both hard and soft strengths. Hard strengths cover details such as product quality, product price, and product delivery; and soft strengths cover elements concerning financial soundness, production capacity, flexibility, geographical location, standards and certificates, information and communications technology (ICT) level of business operations, and talent and innovative capacity. In addition, MNCs need to take into consideration the internal and external factors contributing to the long-term success of the business relationship. The internal factors refer to an MNC's capacity to conduct a performance evaluation on SME suppliers and to establish supplier development programs. The external factors refer to the existence of a business-friendly environment, and the availability of physical and informational infrastructure.

SWOT Analysis of the Five Selected Sectors

Based on the understanding of GVCs in the five selected sectors, and the expectations and requirements of MNCs on SME suppliers, this paper uses the SWOT analysis to compare prospects for SMEs to participate in the GVCs of the five sectors. The analysis shows that for SMEs in developed and newly-industrialized economies, the agriculture and electronics sectors offer the higher potential to participate in GVCs; and for SMEs in developing economies, the electronics and handicraft sectors offer the better prospects.

However, since this analysis is derived from a generalized profile of SMEs in the APEC region, this conclusion should only be taken as an illustrative one. APEC economies are encouraged to conduct such analysis at the domestic level or at the industry or product level to identify potential to integrate domestic SMEs into global value chains.

Policy Principles and Best Practices

To integrate SMEs in global value chains, APEC economies could look at policies to assist companies to develop product and company attributes, and to ensure suitable external conditions. As a reference, APEC economies could consider the following policy principles and best practices:

- **Product attributes**

- Economies could set up exchange platforms such as trade fairs, conferences, forums, advisory centers or online platforms to bridge information gaps between MNCs and SMEs.

- **Company attributes**

- To strengthen financial soundness, economies are encouraged to promote supply chain finance and provide financial skills training.
- To enhance production capacity, economies are encouraged to foster collaboration and clustering among SMEs.
- To help SMEs to meet standards and get certificates, economies could harmonize standards and conformance procedures, set up public certification systems to reduce the burden on SMEs to get certificates; in addition, provide training and technical assistance on qualification and certification processes.
- To improve flexibility, economies could provide integrated services – for example, provide financing to obtain technology and training for adaptation together.
- To make geographic location an advantage, economies could ensure macroeconomic stability, market openness, and transparency of rule of law.
- To improve ICT level of business operations, economies could nurture a domestic ICT skill base in the workforce, and establish technology hubs and incubation centers.
- To enhance talent and innovation capacity, economies could facilitate collaboration and dialogue between universities and the private sector (including SMEs), and also ensure MNCs compensate SMEs fairly for using intellectual assets of SMEs.

- **Ensuring external factors**

- To improve the business environment, economies could strengthen local institutions to facilitate business activities. Economies also shall continue implementing trade facilitation and liberalization initiatives to create a favorable environment.
- To improve physical and informational infrastructure, economies could develop both behind-the-border and across-the-border physical and informational infrastructure, and provide SME clusters and networks with access to suitable infrastructure.
- To address sector-specific factors, economies could play an active role in managing risk and reducing impact of disasters, with initiatives to enhance regional supply chain resilience.

Policies to integrate SMEs are needed on two levels: 1) on a general/horizontal level, economies should promote awareness and understanding of the benefits of global value chains; and 2) on an industry-specific level, economies should identify strengths, weaknesses, opportunities and threats for domestic SMEs to enter into global value chains and assist SMEs with relevant policy tools/packages.

Glossary

APEC PSU	APEC Policy Support Unit
CSR	Corporate social responsibility
FTA	Free Trade Agreement
Global GAP	Global Good Agricultural Practices
GVC	Global value chain
HACCP	Hazard Analysis and Critical Control Point
ICT	Information and communications technology
IT	Information technology
ITA	Information Technology Agreement
JV	Joint ventures
MNC	Multinational corporation
ODM	Original design manufacturing
OECD	Organisation for Economic Co-operation and Development
OEM	Original equipment manufacturer
PDA	Personal digital assistant
R&D	Research and development
SME	Small and medium enterprise
SWOT	Strengths, weaknesses, opportunities and threats
USAID	United States Agency for International Development
UNCTAD	United Nations Conference on Trade and Development
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNIDO	United Nations Industrial Development Organization
WTO	World Trade Organization

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CHAPTER 1 INTRODUCTION

1. Background

Overcoming 'across-the-border' and 'behind-the-border' barriers increasingly has become a prominent issue for international trade and investment. The APEC Senior Officials have identified several emerging issues that have serious impacts on business and competitiveness of companies in the region (APEC Committee on Trade and Investment 2011). One issue is enhancing SMEs' participation in global production chains. In their 2011 declaration, the APEC Leaders also stressed the importance of this issue. In 2013, the SME Working Group adopted the concept of global value chain instead of global production chain, as a global production chain is part of a global value chain (APEC Policy Support Unit 2013a), and studying global value chains gives a more holistic picture of SMEs' involvement.

Since then, APEC has carried out discussions and initiatives to foster SMEs' involvement as supporting industries of global production chains. A 2013 issues paper by the APEC Policy Support Unit (PSU) – *SMEs' Participation in Global Production Chains* – identified the most important challenges for SMEs to become competitive players along the chain (APEC Policy Support Unit 2013a). These challenges are related to accessing external finance and managing internal finance, attracting and maintaining human resources, meeting and complying with standards, and coping with emerging international business practices.

Integrating SMEs into global value chains (GVCs) brings both micro and macro benefits (APEC Policy Support Unit 2013a). At the micro level, it enhances the technical capacity of SMEs, increases utilization of operational capacity and production efficiency, builds prestige and credibility for SMEs, and provides a gradual and sustainable way for SMEs to access global markets. For multinational corporations (MNCs), the benefits are more evident. By sourcing from SME suppliers, GVCs can reduce the procurement, production and distribution costs for MNCs; they also enhance productivity, improve access to new overseas markets, increase ability to reach consumers, and bring more flexibility and creativity in product design (Jenkins et al. 2007). At the macro level, a well-connected SME sector is positively linked with economic growth, and it brings job opportunities, increases export value, and builds up foreign exchange reserves. Most importantly, it provides a means to transform the domestic economy into a more productive and competitive environment.

To take a further step on this topic, this paper provides policy and analytical perspectives on the relationship between MNCs and SMEs in the value chains of five sectors: agriculture, food processing, electronics, handicrafts, and automobiles. The APEC SME Working Group at the 36th Meeting, held in the Philippines on 13–14 March 2014, identified these as key sectors where SMEs have a high interest in participating in GVCs. The paper also discusses the governance structure and economic relationship of GVCs, as well as expectations and requirements of MNCs on SMEs. The prospects for SMEs to participate in GVCs are assessed using an illustrative SWOT analysis. Finally, the paper concludes with policy principles and best practices to integrate domestic SMEs into GVCs.

2. Global Value Chains

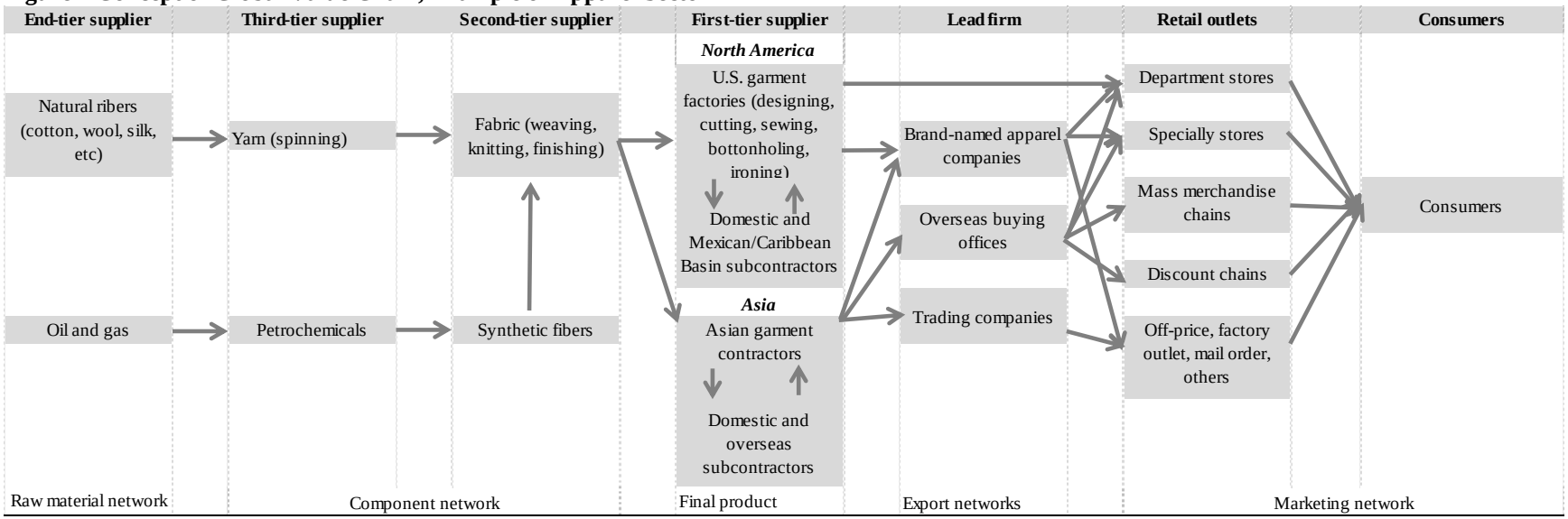
In general, a value chain refers to the full range of value-adding activities to bring a product or service through different stages of production. This includes design and development, input of raw materials and other factors, selection and assembly, physical transformation and processing, acquisition of

required services such as transport and finance, and ultimately response to consumer demand (Kaplinsky and Morris 2002). A GVC refers to a value chain that operates in more than one economy. GVCs not only cover vertical links (among different tiers of suppliers along the chain), but also horizontal links (the interaction among suppliers of the same tier). Along the GVC, a major part of value creation derives from product and process innovation, as well as branding and marketing. Figure1 provides an example of the apparel GVC with numerous players, such as lower-tier suppliers, lead firm, retail outlets and consumers (APEC PSU 2012).

The apparel GVC starts with end-tier suppliers, which are providers of raw materials and have limited skills and investment. In this case, they supply natural fibers and oil and gas to the apparel GVC. Then the third-tier suppliers will transform the natural fiber to yarn and the oil and gas to petrochemicals. At the stage of second-tier suppliers, the yarn is made into fabric and the petrochemicals into synthetic fiber; the synthetic fibers are passed to the suppliers that produce fabric. Usually, the third- and second-tier suppliers need to have processing-engineering skills to meet cost and flexibility requirements, and also the capability to meet quality requirements and standards. The next important player in the apparel chain is the first-tier supplier, from whom design and innovation capabilities are required. In this apparel chain, they are based in North America and Asia, interacting respectively with contractors in Mexico and the Caribbean basin, and Asia. They make fabric into garments, which are ready to ship to the lead firms for branding and marketing. The lead firms control market knowledge, intellectual property, system integration and cost management. They put their own brands on the finalized garments and ship them to different distribution channels, such as department stores and mass merchandise chains, and eventually the garments reach consumers.

As globalization deepens, GVCs have become the backbone of the world trade system (Gereffi, Cattaneo and Staritz 2013), transforming international commerce from all aspects. Currently, around 80 percent of global exports are traded through networks of GVCs (UNCTAD 2013). Almost all industries are woven together through different chains. For example, agro-food GVCs start with agriculture and fertilizer industries; extractive and raw material industries are the beginning of most GVCs in manufacturing; financial services, transport services, telecommunications and information technology (IT) services horizontally serve all GVCs. A growing number of developing economies are participating in GVCs, and their share in global value added rose from 20 percent in the early 1990s to 30 percent in 2000s. Currently, developing economies contribute to nearly half of global value creation (UNCTAD 2013).

Figure 1 Concept of Global Value Chain, Example of Apparel Sector



Source: (Gereffi and Memedovic 2003).

Since being noticed as a prominent phenomenon, GVCs have experienced very rapid development in the Asia-Pacific region, especially among developing economies. As early as the 1960s, the apparel GVC sprawled across the region to take advantage of low costs of labor and raw materials in developing Asian economies. The automotive GVC emerged on stage in the 1970s, and several automotive companies expanded to new territories to broaden their market access. Starting from the 1990s, the electronics GVC rose as the most prominent phenomenon in global trade discussions. Since 1990s, business process outsourcing[1] has made headlines, and with its nature of crossing value chains, leads the way in transforming business practices, productivity and consumption (Rosey, Buttle and Sandars 2009). Gradually, commercial competition is no longer among industries or economies, but rather among different GVCs.

The expansion of GVCs experienced a slowdown in 2008–2009, when the global economy took a hit from the global financial crisis. Starting with trade credits drying up, the crisis soon spread among different players of the GVCs; some GVCs broke down and others were forced to react. As a consequence, global exports decreased sharply by 20 percent in volume terms in 2009 (UNCTAD 2012), which was dubbed the 'Great Trade Collapse'.

However, beyond the decline in global trade, the global financial crisis has far-reaching implications on GVCs. Some structural changes are evident:

1) **Consolidation**: Within the GVC, instead of having a number of first-tier suppliers, more lead firms prefer to source from larger and competent first-tier suppliers. These suppliers have the capacity to operate globally, particularly in the branch locations of the lead firm. Consolidation makes it more difficult for economies and firms that have not yet participated in the networks to join the GVCs (Van Biesebroeck and Sturgeon 2013).

2) **Convergence**: As different GVCs develop, synergies emerge among them. Lead firms in different GVCs begin to source from the same upstream suppliers; therefore, a convergence of lower-tier suppliers in different GVCs is taking place. An example is Foxconn: in the mobile phone sector it supplies Apple, BlackBerry, Motorola Mobility, and Nokia; in the computer sector it supplies Acer, Dell, Hewlett-Packard, Sony, and Toshiba; and in the information sector it supplies Amazon, Cisco, Google, and Microsoft.

3) Re-shoring: Many manufacturing lead firms have started to re-shore some operations since cost advantage in Asia is diminishing. GVCs in Asia experience increased production costs due to rises in labor, land and other costs. According to the United Nations (UNESCAP 2005), the share of Asia-Pacific population over 60 years of age will double from 9 percent in 2000 to 24 percent by 2050, resulting in labor shortages and putting pressure on labor-intensive GVCs. In addition, property and land prices are inflated in the region, which contribute to rises in production cost. Already as upstream suppliers to GVCs, many SMEs in Asia have reported a significant decline in procurement orders and staff cuts (Rosey, Buttle and Sandars 2009).

4) **Developing economies becoming the major consumer markets:** On the one hand, as developed economies rebalance their finances after the crisis, it is likely that they will cut consumption and slow down demand for imports. On the other hand, the global financial

[1] Outsourcing refers to 'the contracting of a service provider to completely manage, deliver and operate one or more of a client's functions (e.g. data centers, networks, desktop computing and software applications)' (UNCTAD 2003). Business process outsourcing is defined as 'the delegation of service-type business processes to a third party service provider' (Department of Trade and Industry, Government of the Philippines 2003).

crisis warned developing economies about the risk of over-reliance on developed markets; and as a crisis response, developing economies turned to domestic consumption to sustain economic growth momentum. As the middle class grows in developing economies, their share in the global consuming class will rise from 23 percent in 2009 to 59 percent in 2030 (Kharas 2009). Confirming this trend, international trade between emerging economies, the so-called South-South trade, is surging, creating more possibilities for SMEs to enter and upgrade in GVCs. According to Milberg and Winkler (2010), South-South trade in total intermediate goods reached 50 percent in 2009, from 25 percent in 2000.

5) **Trade in services take on a more prominent role:** Among all the GVCs, services serve as the links among different players. Advancement in information technology and improvement in soft and hard infrastructure have enabled services to be traded with increased sophistication, from the original business process outsourcing to more advanced knowledge process outsourcing, and to research and development (R&D), which used to be the core functions of the lead firms. Services off-shoring provides developing economies more opportunity to participate in GVCs, and to transform the local economy from low value adding industries to high value adding ones, such as the knowledge-based economy.

6) **The rise of e-commerce:** The development of e-commerce has played an enabling role in the expansion of GVCs; nowadays many companies use Internet-based systems that integrate data and information between functions and different locations. E-procurement, demand and supply forecasting, and e-logistics, more forms of e-commerce are making their presence in GVCs. Systematized business practices also reduce the politics in cross-functional, cross-location, and cross-company cooperation, making integration and collaboration seamless (Berger n.d.). E-commerce broadens the product ranges while reducing physical stock that is required in a store. Therefore, online commerce has surged as an innovative way for the retail business and the trend will continue over the next decade. In addition, e-commerce also facilitates SMEs participation in GVCs, due to improved access to market information and marketing skills.

CHAPTER 2 GLOBAL VALUE CHAINS AND SMES

As the global business landscape is increasingly shaped by GVCs, it is important for SMEs to gain access to these chains and to grow along these chains. According to estimates by Van Biesebroeck and Sturgeon (2013), SMEs contributed to 52 percent of global private sector output and 67 percent of employment. SMEs play a significant role in the Asia-Pacific region. The latest figures show that SMEs account for over 97 percent of all enterprises in APEC economies.[2] Due to their labor-intensive operations, SMEs in the APEC region employ more than half of the regional workforce. The growth of SME businesses could contribute to increased value creation, production and profits. They could nurture new business ideas, enhance productivity, improve economic structure, and lead economic development on a more resilient and sustainable path (APEC Policy Support Unit 2013e).

The following paragraphs outline the structure of GVCs in the agriculture, food processing, automobiles, electronics, and handicrafts sectors, and examine the current situation and its features, as well as the role of SMEs in these GVCs.

1. The Agriculture Global Value Chain

Agriculture plays a fundamental role in sustainable development and poverty reduction (World Bank 2008). In many places, the global agricultural industry has evolved from obsolete fragmented local production to modern integrated market systems. The evolution is driven by consumer demand as consumption pattern shifts to strict standardization, high quality and more variety (Reardon and Timmer 2005). Progressively, the agriculture sector is structured around GVCs controlled by large enterprises. According to the World Bank, in the coffee, cocoa and tea markets, the four largest enterprises control respectively 40, 50 and 80 percent of the global market. Therefore, facilitating participation of SMEs in the agricultural GVCs has been prioritized on the agriculture-for-development agenda (World Bank 2008). Independent SMEs in the agriculture sector, such as farmers, traders, processers and distributers, tend to be excluded from the integrated value chains and lose out in the global market place (Miller and Jones 2010).

Often, agriculture and food processing value chains are combined as agro-food value chains. In terms of the number of tiers and players involved, the food processing chain is 'longer' than the agriculture chain. In this paper, the discussion of the agriculture GVC is confined to fresh produce from farm gates to final consumers without significant processing, such as fruit and vegetables, and fresh aquaculture products. The next section about the food processing GVC looks at food products that experience transformation from farm to fork, such as confectionery, packaged cakes and biscuits, and canned fish products, etc. Another perspective that differentiates agriculture and food processing value chains is the control over where and how their products reach consumers. For example, suppliers of fresh fruit and vegetables could know and decide in what form their products are delivered to the consumers; while grains can be converted to cereal, feed products, and ethanol, among others, and the suppliers may not control and/or may not be even aware of what kind of processing their products go through.

Figure 2 provides an example of a GVC for fruit and vegetables. From the beginning (left side), seeds, fertilizer, agrochemicals, farm equipment and irrigation equipment are raw input into the GVC, then production is carried out by farms of varied sizes as well as export-oriented large producers. The

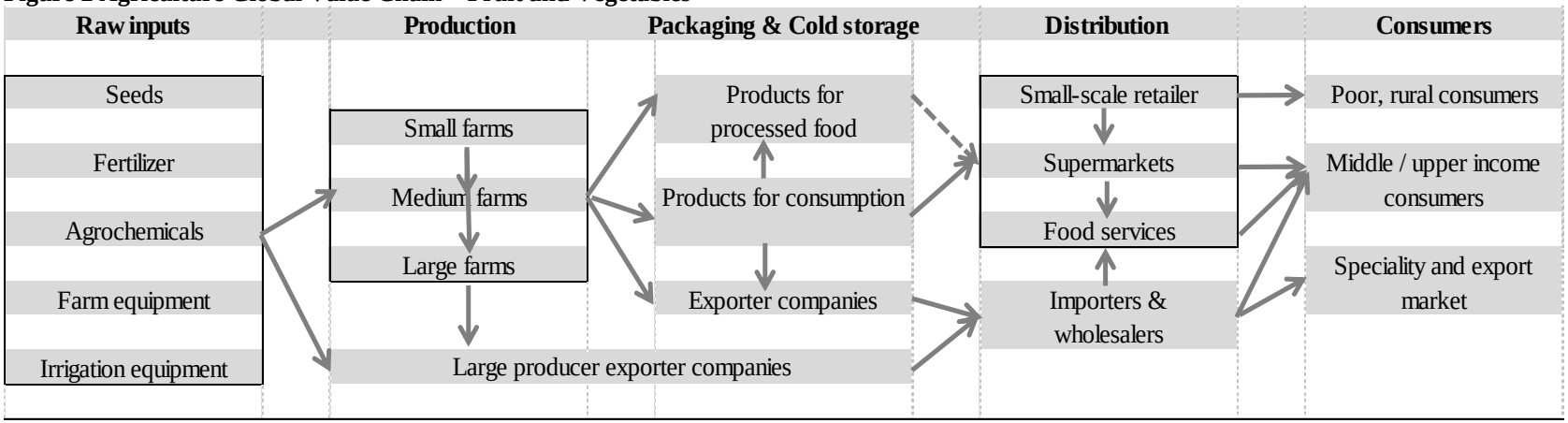
[2] Data for Russia and Papua New Guinea are not available.

products at the packaging and cold storage step are streamed to different channels: for producing processed food, for direct consumption and for export. Through small-scale retailers, supermarkets, food services and trade, fruit and vegetables will reach final consumers. The vertical links cover raw input to production, to packaging and cold storage, to distribution and finally to consumers. The horizontal links cover the interactions among different farms and among different distributors.

Normally, in an agriculture GVC, large wholesalers and retailers as well as market agents play the lead-firm role in organizing and managing the chain. In a few cases, competent producers also set up their chains. For example, five transnational banana companies integrate the banana production chains globally; from plantation to transportation to ripening facilities; they dominate the global banana production and supply 80 percent of global markets (Lee, Gereffi and Beauvais 2009).

In certain cases, the lead-firm position is undertaken by development agencies, non-profit organizations or governments (Miller and Jones 2010). They connect small farmers and agriculture traders to form the value chain. Capacity building, technical services, as well as financial assistance are provided to these SMEs to ensure their involvement. This type of facilitated GVC has yielded success around the world. According to Odo (2007), three elements contribute to the success of this facilitated model: 1) base the model on consumer needs and devise the chain backwards; 2) connect the local producers and combine their production capacity; and 3) leverage on the value chain to obtain finance. In addition, Marangu (2007) stressed the importance of functioning commercial signals – a facilitator shall not participate in the chain or provide finance directly or subsidize the business costs. The experience of the Peru Poverty Reduction Assistance Project shows that facilitators can help to identify market opportunities and provide information. Due to this project, Peru has a growing share in the global market of artichokes.

Figure 2 Agriculture Global Value Chain – Fruit and Vegetables



Source: (Fernandez-Stark, Bamber and Gereffi 2011), modified by author.

Note: Dotted line refers to the processing step, which is part of the food processing GVC, not part of the agriculture GVC.

Standards on safety, quality, size, shape and timeliness of delivery are important and prevalent in the agriculture GVC. A lot of supermarkets work with farmers, lower-tier market agents and importers to ensure their product quality. In addition, exporting firms have to provide phytosanitary and health certificates to meet requirements in overseas markets. This incurs substantial costs of inspection and laboratory analysis, and is generally beyond the financial capacity of smallholder producers, which in turn strengthens the leading role of large players.

Most agriculture products have high perishability; therefore, recent investment in the agriculture GVC focuses on cold chains[3] management and transportation, and tracing and tracking of pathways of agriculture products (Miller and Jones 2010). Cold chains and traceability of agriculture products improve quality and safety while reducing wastage and complying with environmental regulations. Cold chains hence contribute to better branding and save unnecessary losses. Also, thanks to this infrastructure based on new technology, agriculture products can be traded globally with reduced seasonality.

SMEs have niche roles to play along the agriculture GVC. Being small makes SMEs more agile to market trends. On the production end, smallholder farmers and producers can improve existing products based on consumer preference and develop new products through innovative techniques. In addition, they can implement new production practices based on current technology. For example, some progressive farmers are investing in crop field trials and breeding programs to improve their products. On the distribution end, SMEs are more sensitive and more responsive to consumer demand, and they can pass information on consumer preference to lead firms, which can revise their market strategy based on that information.

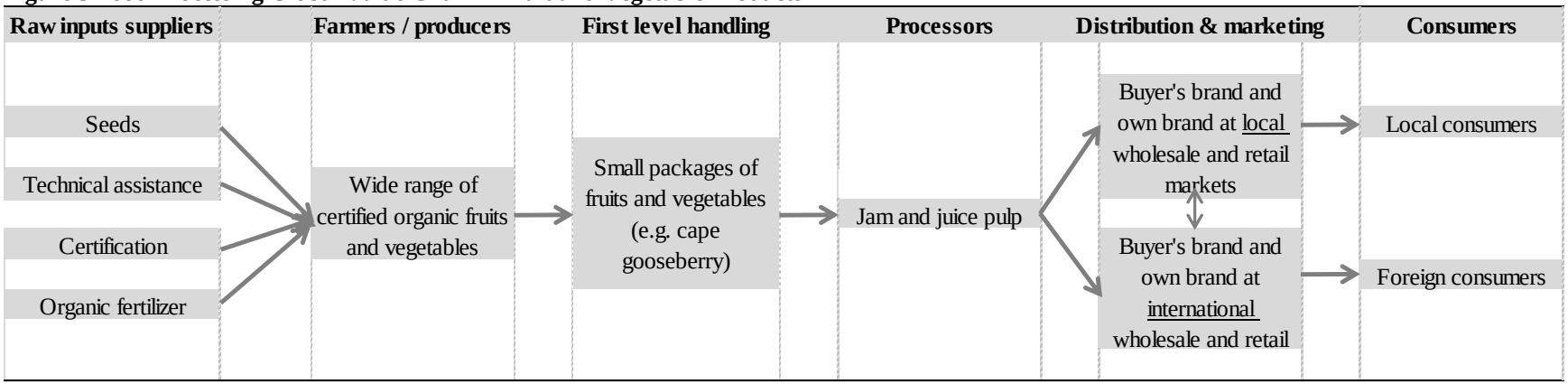
2. The Food Processing Global Value Chain

Differing from the agriculture GVC in the previous section, the food processing GVC extends longer with different levels of handling, processing and packaging between the producers and the consumers. Depending on the underlying products, the food processing GVC can be either simple or sophisticated. For example, in the coffee value chain, before reaching consumers as roasted coffee beans, either ground or whole, mature coffee cherries have gone through wet processing, dry processing, and roasting. As an example of a sophisticated food processing GVC, some tabletop sweeteners and naturally sweetened products (such as diet soda) have ingredients made from stevia leaves. The first processing step is to dry the stevia leaves, and then sanitize and press them. The next step is to pass the leaves to extraction plants to produce steviol glycosides, and then to the refinery to obtain sugar and stevia combinations, which later are used to produce food and beverages for consumption.

Figure 3 shows the food processing GVC with the example of processed fruit and vegetable products. From plantation to consumers, the fruit and vegetables first grow into fresh produce, then they go through the first-level handling for selection and packaging. The selected fruit and vegetables are passed to processers to produce jam and juice pulp. At the distribution and marketing stages, different brands are put on the products for wholesale and retail markets.

[3] Cold chains logistics cover many different elements: pre-cooling, cold storage, refrigerated carriers, packaging, warehouse, and information system and traceability (UNESCAP 2011).

Figure 3 Food Processing Global Value Chain – Fruit and Vegetable Products



Source: (Fernandez-Stark and Bamber 2012), modified by author.

The food processing GVC is becoming increasingly globalized, with broadened sourcing locations and expanded distribution channels; in the meantime, food processing is becoming specialized with new and varied food items being produced. Multinational food companies such as giant agri-businesses, diversified food manufacturers, fast-food franchises and global retailers lead the configuration (Gereffi 2009). Table 1 lists the top 10 food processing lead firms in the world in 2012. They are all headquartered in developed economies.

Table 1 Top 10 Global Food Processing Companies, 2012

Food processing Company	Headquarters	2012 Revenue (billion USD)
Nestlé	Switzerland	56.6
PepsiCo	United States	33.4
Tyson Foods, Inc.	United States	33.3
Mars, Inc.	United States	30.0*
Mondeléz International	United States	29.0
Unilever	United Kingdom	22.0
Groupe Danone	France	20.4
JBS USA	United States	19.8
Kraft Foods Group	United States	18.3
General Mills Inc.	United States	16.7

Source: (Cuneo 2013).
Note: * = estimate.

Most recently, new types of lead firms are emerging in the food processing GVC, for example, financial conglomerates and cooperative agencies. They provide financial and support services to the value chain. The Korea Agricultural Cooperative Federation is an example. It is not only a supplier of agriculture products, but also insurer, processor, and marketer in the food processing value chain; in addition, it provides financial services to local players (Fries 2007; Miller 2007).

The food processing GVC is also undergoing consolidation. As competition among lead firms lies increasingly in product differentiation and satisfaction of premium-paying consumers, it necessitates consolidation within the chain to meet the sophisticated preferences of consumers and achieve economies of scope (Maertens and Swinnen 2009). Another driving force of consolidation in the food processing GVC is the consideration of economies of scale. As the sector becomes more industrialized, machinery and automatic facilities are widely adopted, large processors enjoy higher efficiency and become more competitive and dominant in the market, forcing smaller processors to shut their businesses. In addition, as the power of large-scale processors grows in the food processing GVC, they are able to set stringent food standards and meet complicated consumer requirements, and to manage and control the quality and price of low-tier supplies, which reinforces their position as the lead firms (Dolan and Humphrey 2003). Lastly, a fragmented chain runs a higher risk of potential contamination if multiple actors manage multiple processing stages. Consolidating food processing under a limited number of processors will reduce the contamination risk and increase the traceability of food pathways.

Food safety is the most prominent concern along the food processing GVC. Consumers' anxiety on food safety has grown to an unprecedented level due to several recent cases of food contamination, food recall and food-borne illnesses. For the food processing lead firms, product quality failure is ranked as the top risk (US Center for Disease Control and Prevention 1999). As the initial inputs go through more stages in the food processing GVC, food processors have to work with multiple players

both upstream and downstream of the value chain to ensure contamination risk is well understood and minimized.

Currently, food safety is managed through a constellation of standards. The lead firms select a set of standards to govern the value chain to ensure food safety and product quality, and the standards in turn help the lead firms to structure their value chain and form a strategy. Lead firms set up systems to secure the chain, enhance traceability, and manage labeling and branding; procedures are examined frequently to check compliance. Table 2 shows some international standards on food safety, product quality and social/environmental impact. Standards on food safety limit pesticide use and residue level in fresh produce, as well as food additives used in processing; they also set hygiene requirements on food harvesting, handling, processing and packing. The Hazard Analysis and Critical Control Point (HACCP)[4] monitors and regulates the process within which food products or semi-processed food items pass through the value chain (Gereffi 2009). It is noteworthy that beyond the standards listed in Table 2, there is a universe of food processing standards adopted by various economies on various products.

Table 2 International Food Processing Standards

Food safety	Product Quality	Social/Environmental Impact
Pesticide use and residue limits	Grading	Recycling requirements
Food additives	Freshness	Organic production requirements
Hygiene requirements	Product composition	Labor standards
HACCP	Product cleanliness	Fair trade standards
Traceability requirements	Labeling requirements	Corporate social responsibility
	Nutritional claims	Animal welfare

Source: (World Bank 2005).

Besides prevailing international standards, private standards are growing in numbers and significance along the food processing GVC. The Global Good Agricultural Practices (Global GAP) is one of the major private standards to link developing country farmers to international retailers (Lee, Gereffi and Beauvais 2009). Also, due to intensified competition among food processing lead firms, social and environmental standards gradually act as a feature to differentiate products made in an ethical and environmentally friendly way from those that are not.

As standards continue to rein in the food processing GVC, SMEs feel rising pressure to cope with them. Besides common international and industrial standards, region-specific and firm-specific standards promulgated and enforced by the lead firms are far beyond the capacity of smallholder suppliers and producers. Therefore, it is important for policymakers to harmonize and synthesize the various standards, which will make it easier for SMEs to understand and comply, and at the same time, reduce regulatory burden for public health agencies (Josling, Roberts and Orden 2004). On the positive side, some small players in developing economies have implemented product and processing upgrading, striving to meet the rigid standards, and succeeded in quality-based competition (Jaffee and Masakure 2005).

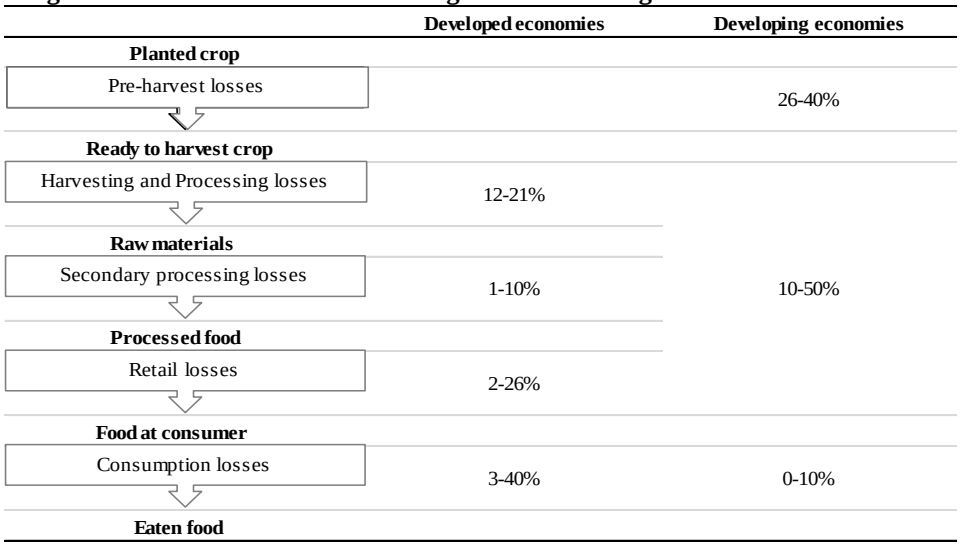
Contrasting with other GVCs, losses and waste along the food processing GVC stand out as a more pertinent issue. Although waste and by-products can be decomposed and converted to gas or used as animal feed, they reduce the total value creation of the chain. According to World Economic Forum

[4] HACCP is a management system in which food safety is addressed through the analysis and control of biological, chemical, and physical hazards from raw material production, procurement and handling, to manufacturing, distribution and consumption of the finished product (US Food and Drug Administration n.d.).

(2009), as much as half of the food supply is lost and wasted along the food processing value chain. As shown in Figure 4, due to divergences in harvesting and handling practices, distribution and storage infrastructure, as well as packaging methods and consumption patterns, food waste and losses occur at different stages within the food processing value chain. For developed economies, food waste occurs mostly downstream at the consumer level; while for developing economies, food spoilage takes place more upstream at the producer and processor level.

Responding to the extensive food waste at the consumption stage in developed economies, the lead firms attempt to solve the issue through innovative and sustainable packaging. Food packages are getting smaller, and easier to be transported and displayed on retail shelves. To address food losses and waste during the production and processing stage, cold chain operations are emerging in developing economies, which would reduce food spoilage significantly, especially in warm climates. For example, in Viet Nam, an integrated fresh fish cold chain was built as a pilot for a domestic food retail market. Due to the project, fish spoilage was reduced significantly and fish farmers' income has been rising. Most importantly, it enables more small-scale farmers to meet the requirements of large and modern retailers and participate in the value chain (Viet Nam Challenge Fund 2012).

Figure 4 Food Waste and Losses along Food Processing Global Value Chain

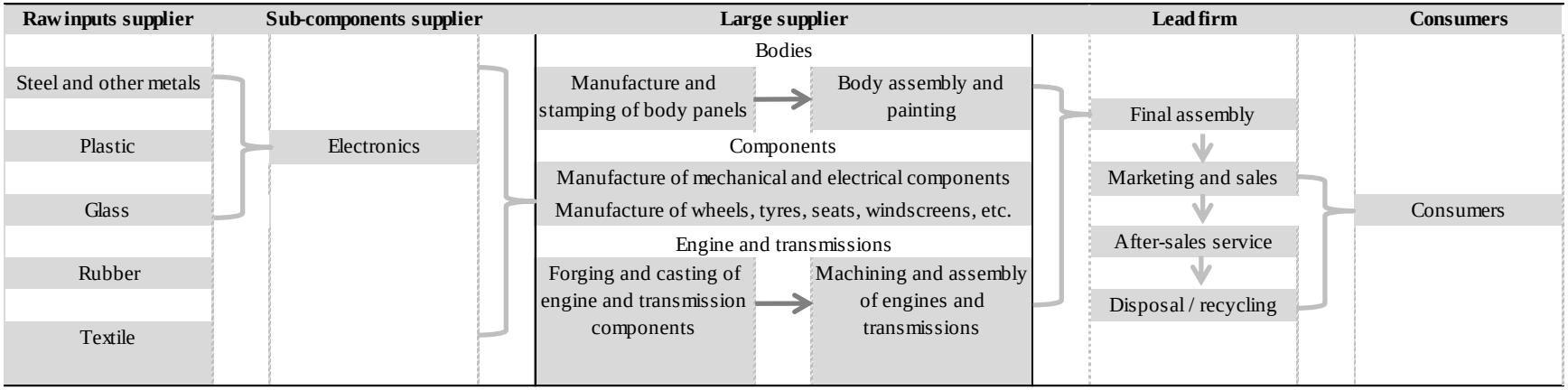


Source: (World Economic Forum 2009).

3. The Automobile Global Value Chain

The development of the automobile industry dates back to the early twentieth century. Three major revolutions have taken place since then: from craft type workshop to standardized mass assembly (Fordism); then to customized, divisional, organized and vertically integrated mass production (General Motor's production model); later the industry evolved towards flexible specialization or lean production (Toyotism). Since 2000, as fuel costs increase and environmental concerns rise, the automobile industry has been exploring ways to improve fuel efficiency and lower emissions, as well as substitute fossil fuel with renewable energy. This trend has been termed the 'green revolution'. (Peter 2010). The automobile GVC is prominent around the globe with multiple tiers of suppliers and sub-suppliers. Figure 5 shows the automobile global value chain. Due to over 10,000 components needed to form over 3,000 parts and subsystems of a car, the automobile GVC is among the most complicated chains, and each lead firm structures the value chain differently based on its market strategy.

Figure 5 Automobile Global Value Chain



Source: (Dicken 2003), modified by author.

Note: Under components, manufacture of mechanical and electrical components cover instruments, carburetors, braking systems, steering components, etc.

Table 3 shows the top 10 world largest automakers in 2012. Japanese carmakers show strong competitiveness in this industry, followed by United States, Germany, Korea and France. Toyota runs a global optimum purchasing framework to identify and recruit the most competitive suppliers worldwide for its engines, transmissions and other major components (Toyota n.d.), and the framework yields successful results, making Toyota the world largest auto manufacturer in 2012 (Sauter 2013). Wingett (2009) mapped the major parts and subsystems for Toyota Corolla, as well as the suppliers that produce or sub-assemble these parts (Figure 6).

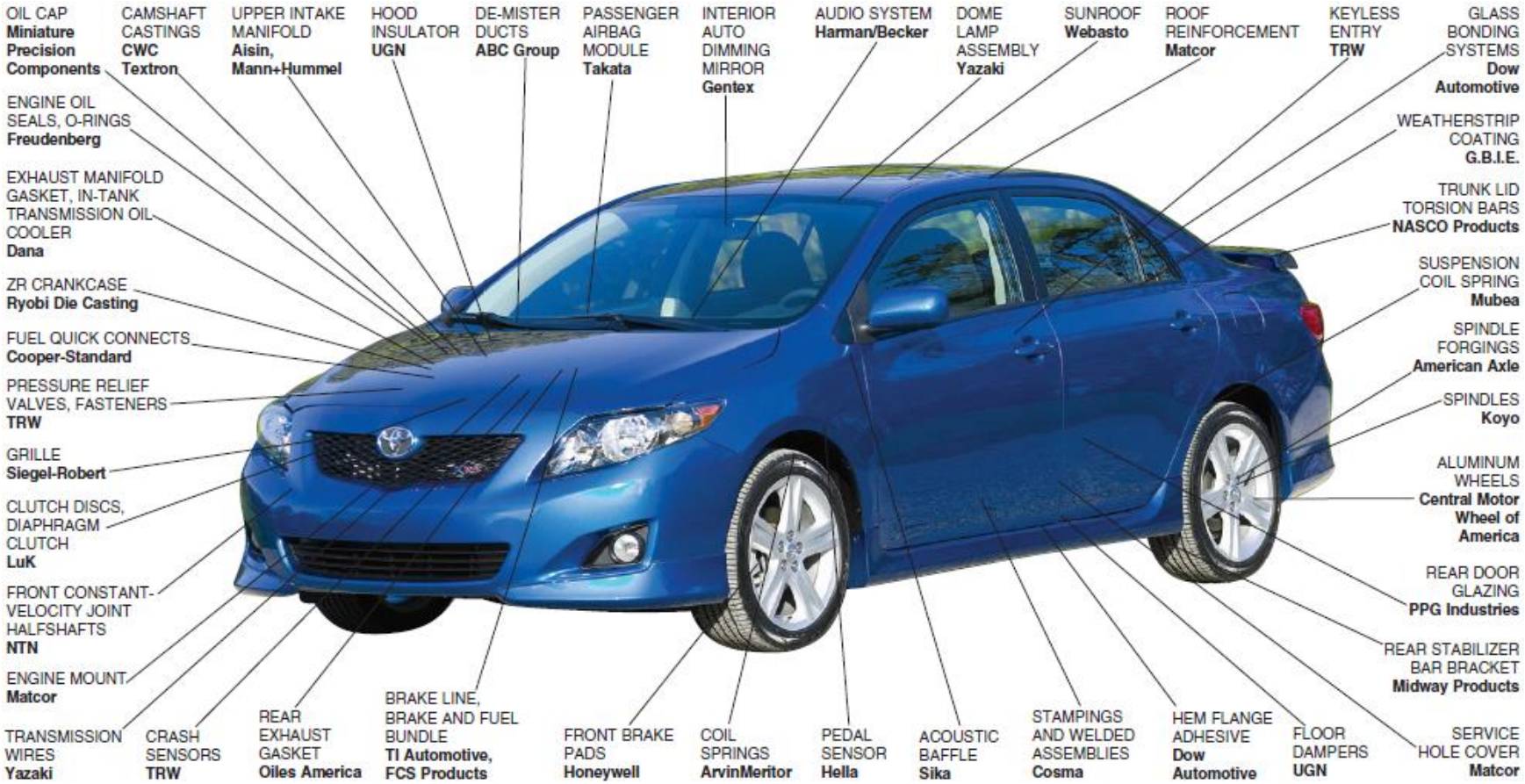
Table 3 Top 10 World Largest Automakers and Their Production, 2012

Automakers	Headquarters	Vehicles	Car	LCV
Toyota	Japan	10,104,424	8,381,968	1,448,107
GM	United States	9,285,425	6,608,567	2,658,612
Volkswagen	Germany	9,254,742	8,576,964	486,544
Hyundai	Korea	7,126,413	6,761,074	279,579
Ford	United States	5,595,483	3,123,340	2,394,221
Nissan	Japan	4,889,379	3,830,954	1,022,974
Honda	Japan	4,110,857	4,078,376	32,481
Peugeot	France	2,911,764	2,554,059	357,705
Suzuki	Japan	2,893,602	2,483,721	409,881
Renault	France	2,676,226	2,302,769	373,457

Source: (Sauter 2013).
Note: LCV refers to light commercial vehicle.

Consolidation in the automobile industry started earlier than in other industries. Ever since the mid-1980s, some suppliers gradually grew in size and capacity to become mega-suppliers in automobile production. They also expanded geographically following the auto lead firms. The supplier plants at each location specialize in producing a few specific components based on economies of scale, and these components are either directly shipped to the lead firms' assembly plants, or go through initial assembly locally to form modules and subsystems and then are sent to final assembly. Auto lead firms in the industry are limited in numbers, and they have the power to structure the automobile GVC, enforce their own strategies onto lower-tier suppliers and to bring the suppliers along during their global expansion, which is described as 'follow sourcing' (Humphrey and Memedovic 2003). As the competence of large suppliers grows, they establish design centers and build system design capabilities, which in turn enable them to take on larger roles in the automobile GVC (Sturgeon and Florida 2004). This means there is less room for SME auto-parts manufacturers in the market, due to their lagging capacity and diminishing competitive edge (Crain Communications Inc. 2013).

Figure 6 Suppliers to the 2009 Toyota Corolla



Source: (Wingett 2009).

Table 4 shows a list of the top 10 global original equipment manufacturer (OEM) parts suppliers. German and Japanese suppliers occupy the central position in the OEM parts market, with suppliers from Canada, United States, France and Korea also in the league. They have a global presence and maintain a high-level and long-term R&D edge, so that they can support high-volume vehicle platforms by the lead firms.

Table 4 Top 10 Global Original Equipment Manufacturer Parts Supplier, 2012

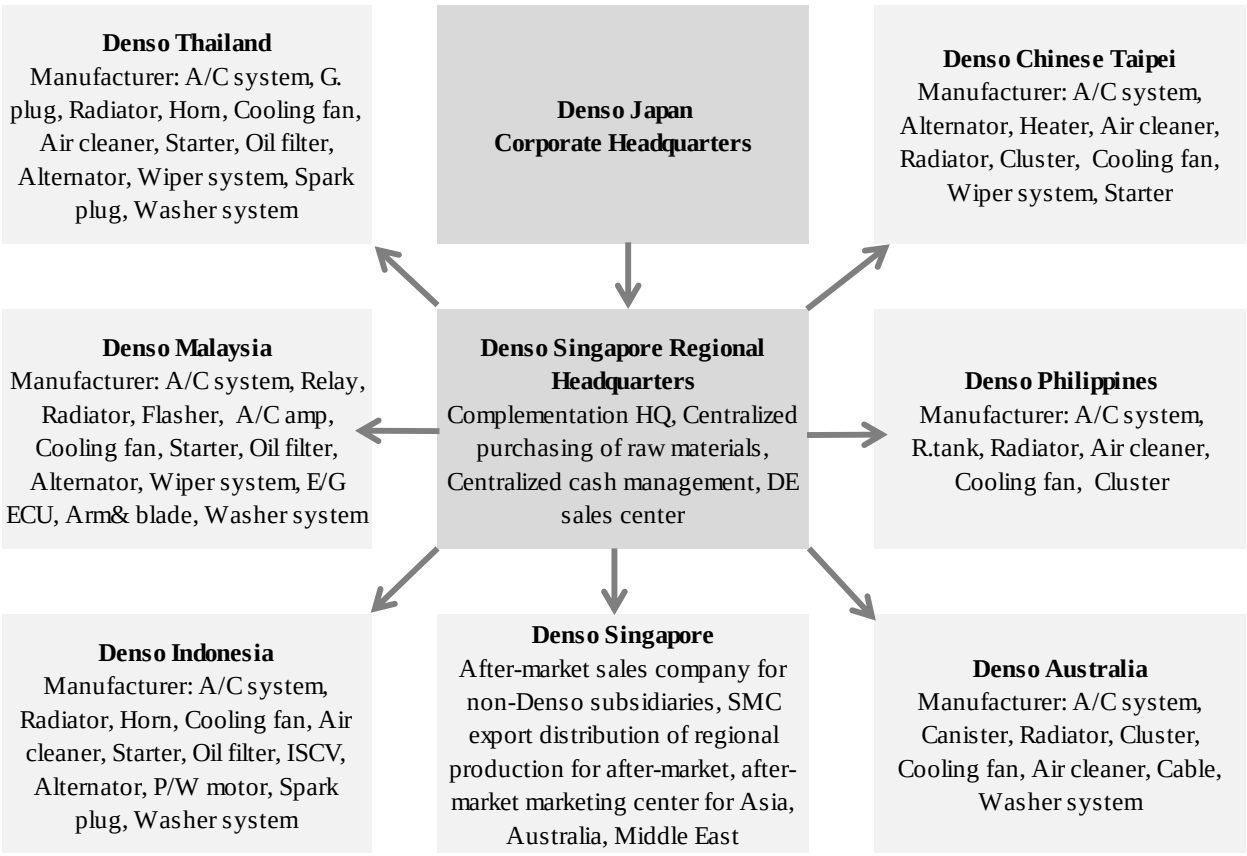
OEM parts supplier	Head-quarters	Total sales (million USD)	Market share			
			North America	Europe	Asia	Rest of World
Robert Bosch GmbH	Germany	36,787 e	17	52	27	4
Denso Corp	Japan	34,200 fe	16	11	71	2
Continental AG	Germany	32,800 fe	21	50	25	4
Magna International Inc	Canada	30,428	53	40		7
Aisin Seiki Co	Japan	30,080 fe	14	10	76	
Johnson Controls Inc	USA	22,515 f	41	47	12	
Faurecia	France	22,500	27	56	10	7
Hyundai Mobis	Korea	21,351 f	22	11	67	
ZF Friedrichshafen AG	Germany	18,614 f	19	58	18	5
Yazaki Corp	Japan	15,801 fe	22			

Source: (Crain Communications Inc. 2013)

Note: e = estimate, f = fiscal year, fe = fiscal year estimate.

For example, Denso produces a broad range of systems and subsystems, including thermal systems, powertrain control, electronic and electric systems, small motors, and telecommunications (Crain Communications Inc. 2013). Denso's success lies in geographically distributed and coordinated production networks, especially in Asia. Figure 7 shows Denso's production network in Southeast Asia. It has production plants in Thailand, Malaysia, Indonesia, Singapore, Australia, the Philippines and Chinese Taipei. Denso established a regional branch in Singapore to coordinate the work among these plants, and report to the corporate headquarters in Japan.

Figure 7 Denso Regional Production Network in Southeast Asia



Source: (UNESCAP 2007).

Unlike other GVCs spanning more geographic locations to take advantage of low cost inputs and labor, the automobile GVC centers in or clusters around major markets, mostly developed economies. There are strategic reasons behind this. First, the competitiveness of automobile manufacturers is strongly associated with growth of the local economy. The automobile industry is well connected with service industries such as car finance, insurance, dealers, maintenance and repairs; hence it creates substantial employment opportunities. For example, in the United States, the automobile industry creates one in ten jobs either directly or indirectly. In addition, the automobile sector contributes substantially to the export market. In Japan and Canada, automobile exports account for over 20 percent of manufacturing exports, and around 15 percent of total exports (Haugh, Mourougane and Chatal 2010). Given the strategic importance of the auto sector in many economies, only local or partially local companies are allowed to produce vehicles for the local market (Schmid and Grosche 2009). Therefore, producing vehicles in major markets is a direct means for auto lead firms to access these markets. Second, vehicle imports usually face high tariffs; therefore automakers prefer to locate plants in economies that have free trade agreements (FTAs) with major markets. For example, Mexico's thriving role in the automobile GVC is backed by 17 FTAs with economies including the United States, Canada and the European Union.

The clustering pattern of automobile production and consumption in developed economies is gradually shifting to developing economies. In the past, suppliers in developing economies were constrained to produce simple, labor-intensive components and could not consolidate their position in the automobile GVC. Take Bangkok as an example – though it was often called 'Southeast Asia's Detroit', its contribution to value creation in automobile GVC used to be quite low in earlier years. Gradually, suppliers in developing economies are taking shares in R&D and sophisticated production

processes (Ivarsson and Alvstam 2005), and even building complete cars. Between 2000 and 2007, the share of United States and Japan in total vehicle production dropped from 40 percent to 30 percent, while the share of developing economies surged from 10 percent to 20 percent (OECD 2009a).

Van Biesebroeck and Sturgeon estimated that car production and sales in emerging markets, especially China and India, are expecting significant growth. On the opposite side, the auto industry in developed economies continues to have gloomy prospects – first, the industry faces overcapacity, high fixed capital costs, high labor costs, and large pension and healthcare commitments; second, difficulties in obtaining a loan and fear of job loss postpone consumers' purchasing decisions (Van Biesebroeck and Sturgeon 2013).

The automakers in developing economies are going through internationalization and claiming higher market shares. In 2008, China overtook Japan, becoming the largest car producer (Rediff Business 2012). In 2012, China produced 18.2 million vehicles, as many as the sum of vehicles produced in the second and third largest auto producing economies, the United States and Japan. At the same time, the shares of India, Brazil, Mexico and Thailand in global car manufacturing are rising (Kumar 2013). On car sales, as developing economies have low car ownership, the rise in disposable income would increase car purchases. Already car purchases in developing economies exceed the levels in developed economies in terms of speed. In 2009, China overtook the United States, becoming the largest car market (Guardian 2010). According to OECD (2009a), four major developing economies, China, India, Mexico, and Turkey, will account for 44 percent of global auto purchases in 2015, rising from 25 percent in 2009.

The shift of major markets to developing economies is not translating into opportunities for SMEs. The mega-suppliers in the automotive sector followed the lead firms to expand geographically and also enjoy global presence. Especially during the global financial crisis, large suppliers took crisis management measures, such as downsizing and cost reduction that impacted the revenue of smaller suppliers (Peter 2010). In addition, small auto-parts suppliers are facing constraints on access to capital, severely affecting their adaptability and forcing them to go out of business (OECD 2009b).

4. The Electronics Global Value Chain

The electronics industry began in the twentieth century during the second industrial revolution and is the most dynamic and important manufacturing sector in the global economy. It creates jobs and generates more revenue than any other sector. Electronics products enhance productivity and stimulate innovation across the world economy (Mann and Kirkegaard 2006). The electronics industry serves as a foundation of a modern economy, enabling the functioning of other sectors such as telecommunications, education, finance, transportation, business services and public services.

Among various GVCs, the electronics GVC has the most extensive geographical coverage (Sturgeon and Kawakami 2010). In the electronics sector, global sourcing is a common practice. The sector has a high level of technology adaptation. Production processes, from design, planning, inventory management, to logistics control, are formalized and systematized, reducing the need to have design engineers and production facilities located in the same place. In addition, governments across the globe tend to promote the electronics industry as the sector leading to a knowledge economy. As a result, more liberal policies are applied to this sector. Furthermore, the World Trade Organization Information Technology Agreement was concluded in the mid-1990s, reducing trade barriers and significantly facilitating trade in intermediate parts and components as well as final products (APEC Policy Support Unit 2013b). Lastly, compared to the auto or other manufactured products, electronics products are light in weight while high in value, making long-distance transportation less expensive and geographical expansion easier.

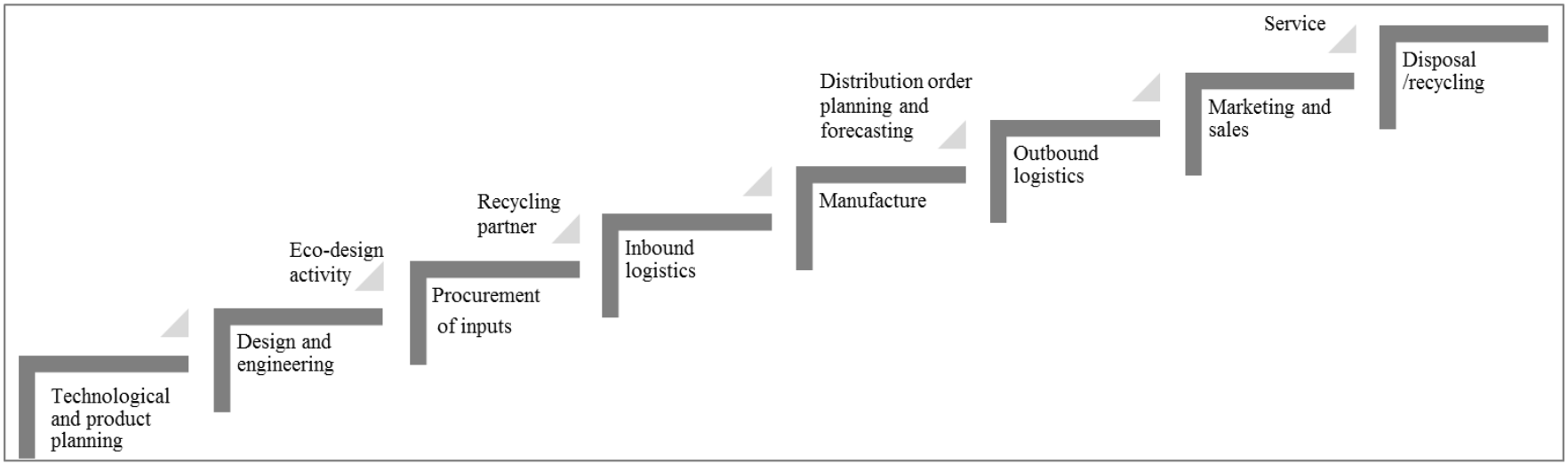
The electronics GVC produces a broad range of products. Besides consumer electronics, such as television sets, mobile phones, computers, cameras, printers, and other home appliances, it also covers embedded electronics in transportation vehicles, defense equipment, medical devices, IT infrastructure, as well as production machinery and facilities that enhance productivity (Decision 2009). Currently, Asia produces most consumer electronics targeted to the mass-market, of which 70 percent is concentrated in China; while developed economies produce professional and automotive electronic components, 70 percent of which takes place in Europe (Decision 2009).

The electronics industry today is a mature, globalized industry, where product life cycles are short and price competition is intense. Depending on the underlying product and the lead firm strategy, the value chain exhibits different structures. For example, computers, television sets and other home appliances are more mature and price sensitive, and the value chain producing these are more decentralized and involve a lot of contract manufacturers. In contrast, the smartphone sector is young and still growing, so the value chain tends to be more vertically integrated and centrally controlled by the lead firms, to ensure that innovation can be applied quickly and products can be ramped on a global scale (APEC Policy Support Unit 2013c).

Figure 8 shows the electronics value chain of Samsung, a Korean conglomerate. It has 83 companies incorporated in Korea, as well as 18 R&D centers, 144 consolidated subsidiaries, about 1000 business entities and 800,000 subcontractors globally (Korea Association Business Consultancy 2012). The electronics global value chain starts with technological and product planning, and then design and engineering. Samsung headquarters conducts and coordinates these activities. Once the product specification is laid out, inputs are sourced globally and shipped through inbound logistics to various manufacturing sites. Sub-components and components are produced and assembled into systems and parts, and then assembled as electronic products that are ready for consumers. The next step is shipping the final products to consumer markets via outbound logistics. Tailor-made marketing and sales are carried out, and as the last step, Samsung disposes and recycles used or spoiled products.

Two types of multinational corporations assume the lead firm position in the electronics GVC. The first type is the multinational manufacturer, which controls the more mature technology and the brands of the products. These types of lead firms are more prominent in the television and home appliances sector, and they enjoy the major portion of profit of the value chain. For example, for television sets and home appliances, Samsung and LG as the lead firms, manufacture their products and take the biggest portion of profit. The second type is the platform leader. These are the companies that control the frontier technology (either hardware, software or both) in electronics products, but do not necessarily have products of their own brands. As an example, for personal computers and mobile phones, most of the profit goes to platform owners, such as Intel and Google, but not the brand owners, such as Hewlett-Packard and Samsung. On certain occasions, the lead firm owns both the brand and the platform. Apple is an example of that, and it exerts strong influence on the phone, tablet and computer markets.

Figure 8 Electronics Global Value Chain – Samsung Group



Source: (Korea Association Business Consultancy 2012).

Table 5 lists the top 10 technology companies by annual sales in 2012. Besides Foxconn, which is the largest contract manufacturer, the rest are lead firms in the electronics industry. Not surprisingly, all lead firms in the electronics GVC are based in developed economies or newly-industrialized economies, such as the United States, Japan and Korea. Since the global financial crisis, a trend is the emergence of large electronics companies from developing economies, especially from China. In 2012, Lenovo shipped over 30 million laptops and 23.7 million smartphones, becoming the second largest computer manufacturer and a strong player in the smartphone market. The same growth was seen with Huawei and ZTE, both based in Shenzhen, China, which benefitted from entry-level smartphone markets and outperformed Nokia, Blackberry and HTC to become global top smartphone manufacturers (APEC PSU 2013).

Table 5 Top 10 Technology Companies by Revenue, 2012

Food processing Company	Headquarters	2012 Revenue (billion USD)
Apple Inc.	United States	156.5
Samsung Electronics	Korea	149.0
Hewlett Packard	United States	120.4
Foxconn	Chinese Taipei	117.5
IBM	United States	106.9
Panasonic	Japan	99.7
Toshiba	Japan	74.4
Microsoft	United States	73.7
Sony	Japan	67.4
Dell	United States	62.1

Source: (Said 2013).

Contract manufacturers prevail in the electronics industry, and ever since the 1980s they have played an irreplaceable role in the development of the electronics GVC. Contract manufacturers can be original equipment manufacturing firms that provide production services to the lead firms. They receive the product specification from the lead firms, purchase materials or components from low-tier suppliers, organize production and assembly, and finally test the products before shipping to the locations or markets designated by the lead firms. If a contract manufacturer also provides product design services, then it is an original design-manufacturing firm.

The large contract manufacturers were initially based in the United States and Canada, and gradually they expanded to lower-cost geographies. As time goes by, some contract manufacturers in newly-industrialized economies are growing and expanding exponentially, especially firms based in Chinese Taipei. Table 6 shows the top 10 largest contract manufacturers in the world based on 2009 revenue. Foxconn (Hon Hai), based in Chinese Taipei, is currently the largest contract manufacturer in the industry, running production lines in China, Brazil, India, Japan, Malaysia, Viet Nam, United States, Mexico, Hungary, Slovakia and Czech Republic (Duhigg and Bradsher 2012).

Table 6 Top 10 Largest Contract Manufacturers in Electronics GVC, 2009

Company	Headquarters	2009 Revenue (million USD)	Primary role
Foxconn/ Hon Hai	Chinese Taipei	44,065	OEM
Flextronics	United States and Singapore	30,949	OEM
Quanta Computer	Chinese Taipei	23,265	ODM
Compal Electronics	Chinese Taipei	19,424	ODM
Wistron	Chinese Taipei	16,226	ODM
Inventec	Chinese Taipei	12,349	ODM
Jabil Circuit	United States	11,685	OEM
Celestica	Canada	6,092	OEM
Sanmina-SCI	United States	5,177	OEM
Venture	Singapore	2,428	OEM

Source: (Sturgeon and Kawakami 2010), modified by author.

The electronics GVC faces intense competition. Electronic gadgets are highly substitutable on product level, both for lead firms and suppliers. Though brands and designs differ, the basic functions and features of electronic products converge. Even with large market shares in specific product segments, lead firms and large suppliers have to focus on innovation and develop new products to thrive. Taking mobile phones as an example, Motorola and Nokia were once big mobile producers; however, due to lag in innovation, they have lost out in the smartphone market and have to sell their brands to other companies. Competition among suppliers is even tenser. Modality is pervasive in the electronic parts; besides a number of suppliers that control key technology, normal suppliers have to constantly improve their products to maintain their customers (the lead firms). In addition, the lead firms in electronics GVC directly negotiate the inputs from raw material suppliers, so markups on generic parts are none or small, and contract manufacturers set a low profit margin (Sturgeon and Kawakami 2010).

Like other GVCs, the electronics GVC is experiencing consolidation. Large global operating suppliers are growing with increased capacity to provide lead firms with one-stop shopping solutions. Not only do they produce goods from the electronics GVC, they also provide services that ensure the flow of goods along the chain, such as cross-border logistics and inventory management (Sturgeon and Lester 2004). The global financial crisis has accelerated the consolidation progress. Organizationally, some large lead firms have started to spin off their R&D and design arms and become factory-less lead firms.

Geographically, electronics production has started shifting back (re-shoring) to major consumer markets, especially the United States. As production costs rise in China, a number of lead firms are re-shoring part of the electronics GVC back to the United States. For example, Apple announced in December 2012 that it would invest USD 100 million in the United States to produce Apple laptops; Element Electronics, a television set lead firm, also announced that it will start to assemble television sets in the United States (APEC Policy Support Unit 2013c).

A notable divergence in the electronics market exists between developed economies and emerging economies. In developed economies, most purchased products are branded electronics with labels of renowned lead firms; while in many emerging economies, low-cost white-label products produced by small domestic firms account for the majority of the local market (APEC Policy Support Unit 2013c). White-label products compete on price and require lower-level technical skills for production; therefore, it gives SMEs opportunities to enter into the electronics industry. However, SMEs need to strive to grow in the electronics GVC, build up technical capacity and move to more value-adding activities, so as to establish a strong position in the chain. SMEs in China are a good example: they

started with assembly operations and production of simple and low-value parts, gradually moving to more sophisticated parts with rising technical levels.

Besides producing physical components, opportunities also emerge for SMEs to provide services in the electronics GVC. For example, applications (apps) for smartphones are a fast expanding sector. After Apple launched its iPhone 4S, more than 18 billion apps were downloaded from the App store in a 3-month period; currently there are over one billion downloads each month (K. Miller 2013). A lot of applications are developed by SMEs with a certain level of technical capacity. In the United States, the top four big developers in the smartphone app sector account for only 11.8 percent of industry revenue; thousands of small developers play an active role in the fragmented market (IBIS World 2014). As the apps can also be used in other electronics products, such as tablets and personal digital assistants, the prospects can be bright for SMEs in this area.

5. The Handicraft Global Value Chain

Handicraft production is an expanding global industry partly due to reduced shipping costs. The handicraft GVC has woven isolated traditional artisan communities into interconnected modern commercialized production chains. The handicraft industry is part of the accessory market, particularly the home accessory market. It embraces an extensive range of products such as glassware and ceramics, lacquer ware and handmade paper, and paintings, silk scarves and silverware. Besides quality and design, the value of handicraft production also derives from historical, artistic, and ethnic elements and the unique characteristics of the artifacts. Some artisans add modern and contemporary features to their products to gain wider popularity.

Though the sector exhibits a vibrant landscape, there is no globally unified definition or classification on handicraft. Hence exports of handicraft products are scattered across HS subheadings in international trade statistics. The International Trade Center puts artisan products under creative industry,[5] which covers clothing and accessories, decoration, household items, gifts, toys and stationery. There are two perspectives of the handicraft sector: production and market and/or consumption. From a production perspective, advanced manufacturing technology has transformed hand-based individual production to machine-based mass production; currently machines produce more handicraft products. Therefore, handicraft products can be divided between handmade crafts and industrial crafts (Fillis 2008). From a market perspective, based on usage, the handicraft sector can be grouped into four categories – functional wares, traditional art, designer goods and souvenirs (Table 7). Each category has its value segment and its main distribution channel.

[5] Creative industries refer to industries that produce tangible or intangible artistic and creative output, and have a potential for income generation through the exploitation of cultural assets and the production of knowledge-based goods and services (both traditional and contemporary) (UNIDO 2006).

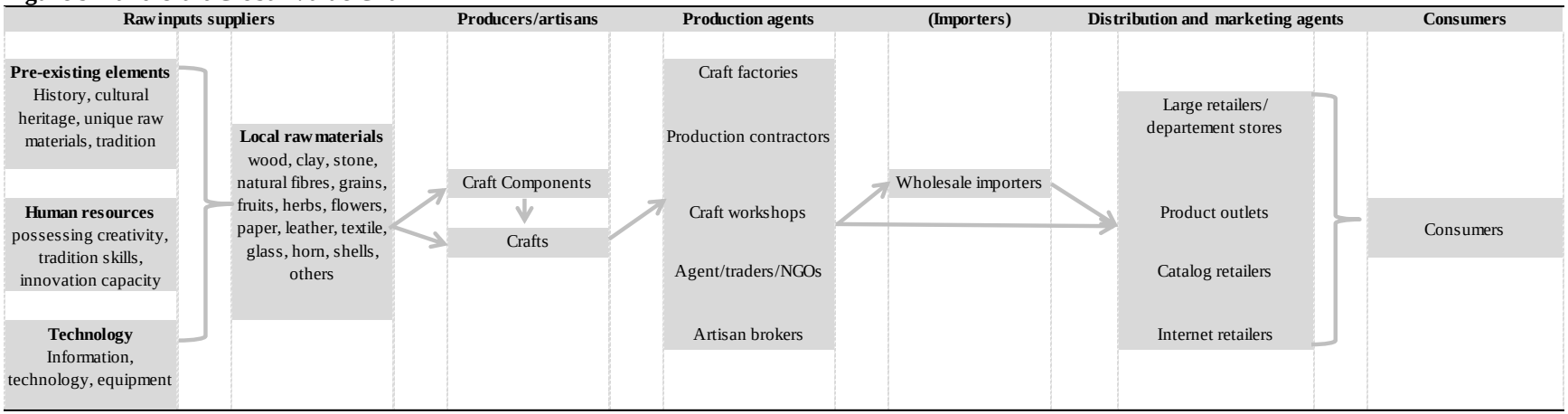
Table 7 Handicraft Sector

Category	Products	Value	Primary market
Functional wares	Pottery, tiles, furniture, baskets, picture frames, boxes, candles and candle holders,	Low end	Big-box stores
Traditional art	Ethic crafts, cultural crafts, paintings, vases, masks, sculptures, ceramics	Mid to high end	Small chains and independent retail stores
Designer goods	Fashion handbags, shoes, cloth, jewelry	High end	Specialty stores
Souvenirs	Ornaments, embroidered and sewn textiles, Decorative accessories, papier mâché, toys	Low end	Souvenir and gift shops

Source: (Morris and Turok 1996), modified by author.

Figure 9 shows the handicraft GVC. Pre-existing elements refer to history, cultural heritage, unique raw materials and traditional knowledge; artisans are the human resources possessing creativity, traditional skills and innovation capacity; and technology, either simple or sophisticated, includes information and equipment. These factors together with local raw materials are the inputs into the handicraft production process. In the next stage, raw materials go through a series of procedures, such as molding, cutting, painting, preservation treatments, labeling, and packaging; a handicraft is then produced and ready for shipment.

Figure 9 Handicraft Global Value Chain



Source: Author, based on UNIDO (2006).

As handicraft production and markets are fragmented, there is no single type of lead firm in the chain. Historically, wholesale importers served as the bridge between supplier market and buyer market, assuming the leading role in the chain. However, as the handicraft GVC consolidates, more distribution and marketing agents avoid wholesale importers and source directly from production agents. Production agents include craft factories, production contractors, craft workshops, traders and non-government organizations, as well as artisan brokers. They identify and inspect potential suppliers, assist in negotiation and settlement of the product specifications, supervise production and ensure quality control, handle payments, consolidate the order and arrange shipment (USAID 2006). This group of production agents is becoming the intrinsic lead firms. Their position is increasingly strengthening as producers and/or artisans and distribution and marketing agents rely on them as the only market channel.

The key force of development of the handicraft GVC is to satisfy the needs and tastes of consumers. Today's handicraft market is driven by fashion styles, creative combination of colors and trendy designs, which shorten the life cycle of handicraft products. According to USAID, in the 1990s, a handicraft could be displayed on shelves for years, but in 2000s, a typical handicraft design only lasted six months (USAID 2006). Therefore, handicraft producers and artisans have to keep abreast of trends or lead the market if possible.

The handicraft sector is labor intensive compared with other sectors. Particularly in developing economies, it creates employment opportunities for the poor and represents a significant portion of exports. Currently, China and India, together with other Asian economies, account for most global handicraft production, and their position is likely to be strengthened further. China is the largest producer of handicraft products, accounting for approximately 30 percent of handicraft global trade (Ernst & Young 2012). Modern technology and mass production are commonly adopted in China's handicraft sector, making the sector highly structured and market-oriented. While industrialization is lagging with other Asian producers, which are seen as small in scale and often home-based, their production is transforming toward modernization (USAID 2006).

A distinguishing feature of the handicraft GVC is that e-commerce plays a significant role in product distribution. Information and communication technology, along with the Internet, enable global payments and facilitate the exchange of information on goods and services. Since the nature of handicraft products requires less strict shipping and fewer logistics conditions, nearly all distribution and marketing agents run retail websites, and some complement them with mail catalogues. Some production agents, and even producers and artisans, are selling their handicraft products online to capture a larger share in retail prices (USAID 2006). Though consumers have concerns of banking security, personal data privacy and quality of goods and services online, e-commerce will become more influential in the handicraft sector, which also opens opportunities for SME handicraft producers with basic Internet infrastructure and trading skills.

Though classification of the handicraft sector shows that different categories fit different value chain stages, studies on the home accessory market exhibits polarization in handicraft markets[6] in recent decades – both low-end and high-end segments are growing while the middle-end markets are stagnating or shrinking (Boswell 2004). The big-box retailers sell a wide range of handicraft products catering to the low-end market, especially by importing from China, India and other Asian economies.

[6] Home accessories account for a major portion of the handicraft markets. Home accessories encompass a broad array of products that often overlaps with other categories such as furniture, tabletop, garden and art. It is part of the much larger home furnishing market that includes semi-handicrafted and machine-made goods (USAID 2007).

In tandem, the high-end luxury market is expanding as well. Consumers in developed economies tend to favor uniquely designed good-quality handicrafts rather than low-priced mass production handicrafts that is already a niche market for smallholder producers and retailers.

The handicraft GVC is expected to grow further in both product coverage and geographical expansion, presenting extensive opportunities for participants along the chain. The demand for handicraft products is increasing exponentially as income is rising in developing economies, presenting SMEs with great opportunities. As predicted by Lee and Littrell (2003), this is motivating an increase in the number of SMEs engaged in the handicraft sector, together with the low-entry requirements, such as low start-up capital, flexible working time and location.

CHAPTER 3 UNDERSTANDING SMES' INVOLVEMENT

Experience from various industries and economies confirm that SMEs can work together with MNCs, play a significant part in GVCs and be internationally competitive. The value chain links benefit MNCs and SMEs, as well as the local communities where the SMEs are based. It is a promising route for SMEs and their local communities to engage in sustainable development and growth. This chapter looks at different perspectives of GVCs, from the external chain-to-chain comparison in governance structure, to the internal firm-to-firm economic relationship, and finally the specific bond between the MNC and its SME suppliers.

MNCs organize and lead their GVCs. As lead firms, they set the 'rules of the game' in the value chain to govern a multitude of suppliers (Abonyi 2005). At the beginning, they decide on what to produce and how to produce, and then choose production and product standards. Next, the MNCs assess the capacity and capability of suppliers and select the most suitable ones, and allocate what and how much is to be produced by each supplier and when. If an SME is a service provider, depending on its strengths and weaknesses, the MNC will decide whether to get it engaged. Usually the roles for services SMEs are R&D, product design, logistics, marketing, and retailing, among others. The lead firms will monitor the production process and check the intermediate inputs on a frequent basis to ensure delivery quality and timeliness. The goal of the lead firms is to guarantee the smooth functioning of the GVC and achieve the highest profits in a responsible and sustainable manner.

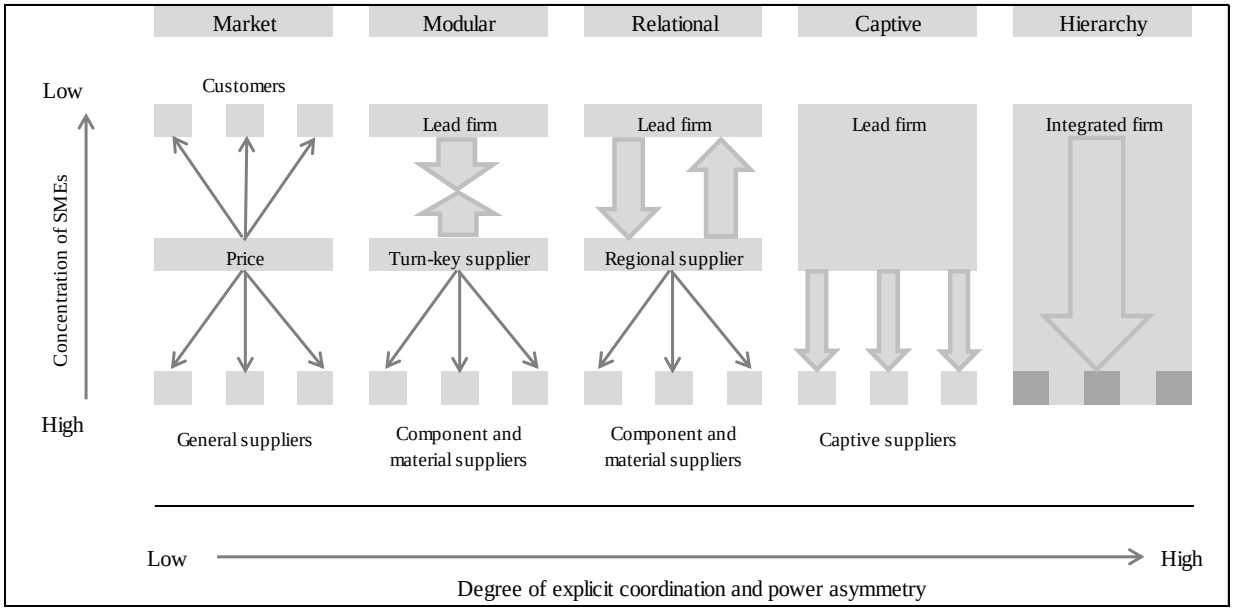
1. The Relationship between Multinational Corporations and SMEs in Global Value Chains

MNCs govern GVCs under different structures. The governance structure reflects the difficulties and challenges to enable the chains to function. Working with firms downstream and upstream incurs 'mundane' transaction costs – the costs involved in coordinating activities along the chain (Gereffi, Humphrey and Sturgeon 2005). Transactions take place at each stage of the GVC among lower-tier suppliers and among higher-tier suppliers. In addition, the roles of value chain partners evolve over time, like the current consolidation trend, which pushes the relationships in the value chain to adapt to new situations.

Governance Structure

Research on the governance structure of GVCs dates back to the early 1970s. As GVCs are constantly evolving, the governance structures also emerge in different forms and exhibit different characteristics. Gereffi, Humphrey and Sturgeon (2003) showed that a diverse range of factors such as history, culture, institutions, and geographic and social contexts impact the governance structure. They also showed that three key factors determine the value chain structure: the complexity of transaction, the codifiability of information and the capability of suppliers. In addition, Gereffi, Humphrey and Sturgeon (2003) mapped five different governance structures (Figure 10).

Figure 10 Governance Structures of Global Value Chains



Source: (Gereffi, Humphrey and Sturgeon 2003)

Note: ⇨ = exchange based on information and control. ⟶ = exchange based on price.

- The **market governance structure** is one of the less extreme cases of value chain governance since it is most loosely organized. The suppliers in this structure provide simple standard products which are either raw or with a simple processing procedure. Transactions are price-based, because products are highly standardized and less customer-oriented, and low-end suppliers can be easily replaced. In practice, the market governance structure is like a spot market, numerous producers meet consumers directly, and it requires no transaction-specific investment, therefore no intermediate agents or sophisticated processesing of products are involved.

- In a **modular governance structure**, the lead firm and the turn-key supplier have complementary competencies in terms of innovation, technology and market frontier. They work closely to develop the product, then the turn-key firm will be in charge of setting production and product standards, and managing the low-tier component and material suppliers. The product architecture is modular. This chain represents the consolidated value chain in the automobile and electronics sectors, where the the first-tier large supplier enjoys a high degree of autonomy and expanded responsibilities. This type of governance structure is sometimes called a collaborative partnership (Central Asia Regional Economic Cooperation n.d.).

- A **relational governance structure** depicts a more complex link. The lead firm and the regional supplier develop a mutual-dependence relationship based on strengths, reputation, ethnic values, trust level, social and spatial proximity, or even family ties in certain cases. The products in this chain are less codified, which increases the complexity of value chain governance. Face-to-face communication and explicit coordination are in place to ensure the functioning of the relational value chain. This type of governance structure is sometimes called strategic alliance (Central Asia Regional Economic Cooperation n.d.). Within this structure, the regional suppliers are also responsible to manage low-tier component and material suppliers, and work as local agents of the lead firm.

- A **captive governance structure** is a quasi-hierarchy link, where the lead firm exerts close control on production. The lead firm specifies product design features and requirements, and small suppliers invest in particular production equipment and machinery and become specialized in producing parts and components. Due to the high investment made to build production capacity, the suppliers face significant switching costs, and therefore depend on the lead firm and are captive to it. The suppliers are confined to perform specific tasks with very limited scope, such as assembly, while the lead firm will handle most sophisticated tasks, such as product design, supply chain management, and quality check and control.

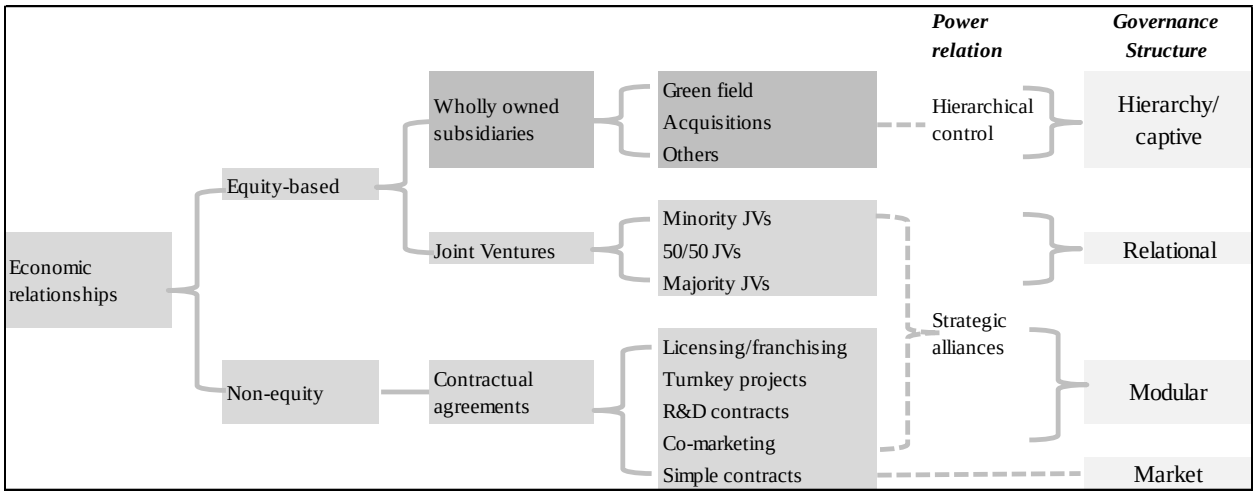
- The **hierarchy governance structure** is vertically integrated. The integrated firm controls the whole production process and its subsidiaries, as well as the local branches that supply raw materials and components. Nothing is outsourced to external suppliers. As the MNC enjoys direct ownership of firms in the value chain, it's role is termed as the integrated firm rather than the lead firm. Although the goverance structure is built on rigidity in this case, it still has to source externally in certain cases to expand production or service capabilities (Gereffi, Humphrey and Sturgeon 2003). This structure is one of the extreme cases of value chain governance.

Although the five governance structures exhibit distinct features, in reality, value chains could be more complex, and have more tiers of suppliers and complicated configurations. Combinations of different structures in one chain are common, especially in sectors like electronics, automobile and aerospace. A good example is the iPhone GVC – though with a high level of vertical integration, the iPhone GVC still relies on a wide range of suppliers. Apple controls 'all the major critical parts of the chain used to make and sell products' (Bajarin 2011), that is, hardware design, software development, services production (such as iTunes and iCloud), and marketing and sales. These parts of the iPhone value chain display the hierarchy governance structure. The other parts of the iPhone value chain are outsourced to manufacturers, assemblers, and components suppliers under relational or modular structures. Though the Samsung Galaxy is the iPhone's main competitor, Samsung is also Apple's major supplier. Samsung provides flash memory, DRAM and applications processors for iPhones, which in total constitute 26 percent of the component cost (IHS iSuppli 2011).

Economic Relationships within the Global Value Chain

Within a GVC, economic relationships among players also show different dynamics and evolution. These can be affected by many factors, such as the duration of cooperation, expectations and goals of different parties, frequency of communications and methods, planning and performance evaluation, and benefits and burdens.

Figure 11 Economic Relationships within Global Value Chains



Source: (Peng 2006), modified by author.

Figure 11 depicts the economic relationships that exist among different tiers of suppliers and those between the lead firm and the suppliers. From a micro point of view, the economic relationships can be grouped as equity-based or non-equity based. The equity-based relationships can then be split into wholly owned subsidiaries and joint ventures (JVs). Further down, wholly owned subsidiaries cover green field investments, acquisitions and others (such as brownfield[7]); and joint ventures cover minority JVs, 50/50 JVs and majority JVs. Non-equity relationships are based on contractual agreements, including licensing/franchising,[8] turnkey projects,[9] R&D contracts, co-marketing, and simple contracts.

Wholly owned subsidiaries are under vertical control, meaning the lead firm or upper-tier supplier takes full control of the lower-tier suppliers' assets, production arrangements are under ownership rights (Todeva and Knoke 2005). This is often seen in hierarchy and captive GVC governance types. As for joint ventures and contractual agreements, the lower-tier suppliers enjoy a certain degree of flexibility in selecting and producing the intermediate inputs, and the cooperation among firms in the GVC is more towards strategic alliances, with governance structures being relational, modular, or market-type.

2. Expectations and Requirements of Multinationals Corporations on SMEs

According to OECD and WTO (2013), meeting product specifications is the priority for an MNC's decision to engage with SMEs, followed by production cost, market size, delivery, compliance ability, as well as transport capacity and labor skills. Selecting and engaging SMEs is a complex process, and MNCs have to constantly assess SME suppliers in various perspectives. Conference Board of Canada

[7] Brownfield refers to a market entry mode in between green field and acquisition. The acquirer after buying the company replaces the plant equipment, labor and production line. It is faster than green field to start production, and faces lower costs on integration, restructuring and resource transfer than acquisition (Ovcina 2010).

[8] Licensing refers to one company granting the other company the rights to use patented technologies or production processes in return for royalties and fees. Franchising refers to a franchiser granting another use of a brand-name identity within a geographic area, but retains control over pricing, marketing and standardized service norms (Todeva and Knoke 2005). Licensing can take many forms, including patents, inventions, formulas, processes, designs, copyrights and trademarks (Hill 2003).

[9] A turnkey contract refers to the contract manufacturer's purchase of a product or service that is ready for use (Sturgeon 1998).

(2009) surveyed over 70 SME owners and 45 MNCs in 2009 and collected first-hand views on establishing business relationships from both sides.

Mutual Benefits

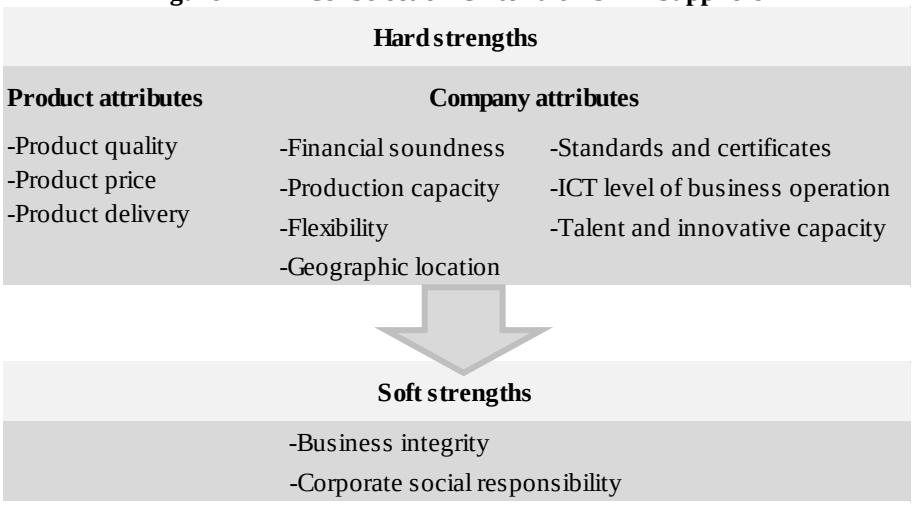
Mutual benefits are the prerequisite condition for MNCs and SMEs to consider engaging in a GVC. As mentioned in the previous paragraph, competition is seen more frequently among different GVCs, rather than among different firms, industries and economies. As GVCs gain depth and breadth in the global economy, the success of MNCs are closely linked with the functional efficiency and effectiveness of their value chains.

On the one hand, MNCs can enhance their innovative capacity and productivity by working with SMEs. SMEs usually bring local knowledge and human resources that help MNCs to quickly establish a strong position in local markets. From an operational point of view, SMEs run lower overhead costs, and in many cases can produce goods and services in a more cost-effective way that would improve production efficiency for MNCs (Conference Board of Canada 2009). On the other hand, working with MNCs will enhance the reputation of SMEs.[10] SMEs could also access expertise, advice, and finance from their MNC partners, which will help SMEs to improve their product quality and production process, which in turn enhance the competitiveness of the SMEs. In addition, being a supplier to an MNC will help an SME achieve economies of scale, access to overseas markets, reinforce business prospects and build confidence.

MNCs' Selection Criteria on SMEs

Before entering a business relationship, the MNCs will assess SMEs on hard strengths, such as product and company attributes, as well as on soft strengths, such as business integrity and corporate social responsibility (Figure 12).

Figure 12 MNCs' Selection Criteria on SME Suppliers



Source: Author based on the Conference Board of Canada (2009).

i. Hard Strengths

SMEs have to produce the right products for MNCs; therefore, the right product attributes are fundamental for an SME to be considered as a supplier in the GVC. Product attributes cover three

[10] MNCs can also improve their reputation from working with SMEs. The association with SMEs will assist MNCs to strengthen their corporate social responsibilities with local communities.

areas - quality, price and delivery. According to the Conference Board of Canada (2009), quality[11] is the top criterion in selecting value chain partners, particularly in sectors with sophisticated chains, such as electronics, automobile, food processing, among others. MNCs conduct quality checks and product testing on a regular basis to verify that SME suppliers meet their product specification. Second is product price, which also plays a key role in supplier selection. MNCs choose SMEs that provide quality products at a competitive price. The low labor cost in Asia is the main reason for MNCs to extend their GVCs in the region. External factors may also impact the supplier price, such as shipping cost and import tariffs if suppliers are located in different economies, of which an MNC would take into account. Lastly, MNCs require SMEs to deliver the products in a timely and accurate manner in the right place. Delivery requirements ensure that production schedules are met, inventory and warehousing are minimized, and overstocks and spoilage are limited.

Besides product attributes, MNCs also check SMEs against company attributes, which covers financial stability, production capacity, flexibility, geographic location, standards and certification, ICT level of business operation, and talent and innovative capacity (Conference Board of Canada 2009).

- **Financial soundness** reduces the risk of contract default and bankruptcy. MNCs pay attention to suppliers' financial standing and credit history, and some hire specialized firms to check the financial situation of SME suppliers.

- **Production capacity** determines if an SME supplier can provide the required goods and services in a stable and reliable way. This is important for large corporations, which would face huge losses if there is a disruption in their value chains. Therefore, larger MNCs always look for SMEs with adequate production capacity.

- **Standards and certificates** add value to the profile of SMEs. MNCs look for suppliers that meet internationally recognized certification or some industry specific standards. One good example is ISO 9000, which certifies the quality management system of the firm. However, according to some MNCs, certificates from international bodies are preferred but not always a necessity.

- **Flexibility** refers to the ability to adjust to changing needs and conditions. It is a desirable trait that SMEs can respond to customers promptly, adjust quickly to increase or decrease in demand, and improve product lines. This is sometimes called adaptability, agility or scalability. Under certain circumstances, MNCs are inclined to turn to leading edge SMEs for breakthrough ideas on product, production, sales and after-sales services.

- **Geographic location** is becoming a less relevant factor due to the rapid evolution of ICT and global logistics. SMEs located close to consumer markets have a comparative advantage in terms of understanding local consumers and market conditions.

- **The ICT level of business operation** is also called business informatization. E-commerce is developing at unprecedented speed. For example, e-procurement significantly reduces the time needed to close a deal between producer and consumer. MNCs look for suppliers that

[11] Product quality includes two aspects: conformance quality refers to no defects; design quality refers to customer satisfaction with characteristics and features of a product (Association for Operations Management 2008).

can participate in electronic data interchange and integrated electronic processes of supply chain management.

- **Talent and innovation capacity** is an indication of entrepreneurial, managerial and leadership human resources of the SME supplier. MNCs know such SMEs have a high potential to develop into leading-edge firms and eventually to contribute considerably to the development of GVCs and MNCs. Moreover, as the global market place is constantly evolving, only innovative SMEs can meet the requirements of MNCs both now and in future, and therefore MNCs are prone to select SMEs with more creative and innovative ideas.

These company attributes may seem ambitious; in practice, some SMEs do match such a profile and thrive in GVCs. These attributes help them to gain a strong position in the chain and develop niches to sustain their positions. Firm size is not a criterion in assessing SMEs; almost all MNCs mentioned that they 'do not recognize and track their suppliers by size' (Conference Board of Canada 2009).

ii. Soft Strengths

Soft strengths are the other important perspective to evaluate an SME supplier. As the name suggests, evaluation on soft strengths may not be as strict as hard ones due to their more subjective nature.

The first is business integrity. It looks at compliance with laws and regulations, promoting fair and free competition, and avoiding conflicts of interest. Therefore, business integrity focuses on the ethical aspect, because being legal does not necessarily guarantee being ethical (Saylor Organization n.d.). Unethical business practices can taint the reputation of both the supplier and the lead firm, and in the present world, reputation is an intangible asset that contributes to overall value creation in GVCs. MNCs have to check business practices of SMEs to ensure business integrity is upheld and the risk of potential damage to their reputation is eliminated.

The second soft strength is corporate social responsibility (CSR). CSR is a rising aspect on SME evaluation. As social and environmental issues are gaining importance in the business world, MNCs are trying to engage with SMEs that could contribute to its commitment and promises on CSR.[12] Some international standards are emerging on examining firm level commitment on CSR, such as SA8000, which specifies standards for decent working conditions.

Supplier selection criteria are not necessarily the same in all industries. MNCs in different industries may value different attributes of SME suppliers. Taking electronics as an example, besides product attributes, the major expectations of MNCs on SMEs are production capacity, innovative capacity, and flexibility. On the contrary, for the apparel GVC, major expectations of the MNC would be related to competitive cost, geographic location, and corporate social responsibility.

3. Factors Contributing to the Long-term Success of MNC–SME Relationships

Once the SMEs become part of GVCs, both MNCs and SMEs should work on how to sustain and strengthen the relationship. Many factors contribute to the long-term success of MNC–SME relationships. Internal factors include performance measurement and supplier development, and external factors include the business environment, as well as physical and informational infrastructure.

[12] According to the Conference Board of Canada (2009), some MNCs enforce CSR on a proactive basis, establishing procedures and closely monitoring the situation; others enforce CSR on a reactive basis, reacting to identified wrong practices.

Building a long-term collaboration calls for continuous efforts on internal factors of the relationship, like performance evaluation and supplier development. Firstly, MNCs have to evaluate the performance of SME suppliers on a frequent basis to provide feedback and ensure that they meet product specifications and to identify whether there are potential risks that might harm the collaboration. Also, based on the evaluation results, MNCs could decide to what level to engage SMEs, should they be general suppliers, component and materials suppliers, captive suppliers, or turnkey suppliers or regional suppliers. In turn, suppliers at different levels could be assessed at different intervals. Secondly, MNCs have to put in place supplier development programs[13] to help SMEs grow within GVCs. It becomes evident that having too many suppliers is counterproductive (Conference Board of Canada 2009); therefore, consolidation is taking place across many GVCs, thus MNCs could focus more on the long term relationships with a few key suppliers. Supplier development programs strengthen the capacity of SMEs, as well as the value chain itself.

External factors can also affect the long-term relationship between MNCs and SMEs. The most important one is the business environment. Open markets are fundamental for MNCs and SMEs to strengthen their relationships. A successful relationship hinges on streamlined trading procedures, efficient customs systems, high transparency in rules and regulations, and absence of corruption and graft (OECD and WTO 2013). Redundant domestic regulations and trade-related bureaucracy disrupt value chain operations and harm the competitive edge of value chain players (WTO/IDE–JETRO 2011). The second external factor is physical and informational infrastructure. Logistics and transportation are crucial in connecting GVCs. Ports, hubs, roads and railway tracks are physical infrastructure that ship goods, services, and people to different geographic locations (OECD 2013). In addition, fast and stable information flows enhance efficiency of GVCs. Informational infrastructure links companies across the world, making communication and interaction easily achievable. Overall, external factors impact on trade costs, hence the competitiveness of GVCs and the long-term success of the MNC–SME relationship.

[13] Supplier development program covers personal and technical training, intellectual capital sharing, and joint investment in new capabilities, system integration, and multi-supplier collaboration (Conference Board of Canada 2009).

CHAPTER 4 POTENTIAL FOR DOMESTIC SMES TO PARTICIPATE IN GLOBAL VALUE CHAINS

After understanding the GVCs of the five key sectors and the relationship between MNCs and SMEs in value chains, this chapter examines the prospects for SMEs to participate in these GVCs using a strengths, weaknesses, opportunities and threats (SWOT) analysis. It is noteworthy that GVCs exhibit geographical heterogeneity across industries and products, therefore, attempting to identify a sector that has the highest potential for SMEs in the APEC region is challenging. Due to this heterogeneity, the chapter provides an example of a SWOT analysis to identify potential for integrating SMEs into GVCs for both SMEs in developed and newly-industrialized APEC economies and SMEs in developing APEC economies. The last part of the chapter presents a summary of the SWOT analysis and sectors with better potential. However, the conclusions are illustrative and should be treated with caution, since not all strengths, weaknesses, opportunities and threats will apply to all APEC economies in the same way. The analysis has attempted to generalize the most common features across the APEC region. Therefore, economies are encouraged to examine themselves using a similar analysis to derive more definitive economy-specific conclusions on sectors with the highest potential for SMEs to join GVCs.

A SWOT analysis is an analytical technique to understand strengths and weaknesses that are internal to an entity or organization, and to identify opportunities and threats that are external (Manktelow and Carlson 2011). It can be used for various purposes, such as setting objectives, environmental scanning,[14] examining and defining strategies, and monitoring and adjusting implementation (Chen and Bruneski 2007). It also helps to find 'a way forward' (Smawfield 2007) by focusing on strengths, addressing weaknesses, taking advantage of opportunities and minimizing threats. Though the information in the SWOT matrix should be objective, the subjective nature of a SWOT analysis should be recognized in the first place (Chen and Bruneski 2007).

In the following SWOT analysis, SMEs in developed and newly-industrialized economies, and SMEs in developing economies are analyzed separately. SMEs face similar types of growth barriers across the globe, such as lack of access to financial instruments, low human resource capabilities, lack of technological capabilities, poor management competencies and governance structure, corruption, and obstacles to trade (Pandya 2012). However, developed and newly-industrialized economies in general have a better business environment and infrastructure to support SME businesses than developing economies.[15] This has resulted in diverging constraints on SMEs, as well as differing levels of resource suppliers for SMEs in these two groups.

[14] Environmental scanning refers to the internal appraisal processing of an organization using the SWOT analysis, including an assessment on present situation, products/services portfolio, as well as product/service life cycle (Chen and Bruneski 2007).

[15] For example, in 2013, five APEC developed economies (Australia; Canada; Japan; New Zealand; and United States) and four APEC newly-industrialized economies (Hong Kong, China; Korea; Singapore; Chinese Taipei) were among the top 30 positions in global Ease of Doing Business Rank; while among developing members, only Malaysia and Thailand made to the top 30 on the list. In 2012, APEC developed and newly-industrialized economies were above the APEC average of Logistics Performance Index; among developing members, only Malaysia scored above the APEC average. Also in 2012, besides Korea, the rest of the APEC developed and newly-industrialized economies scored above the APEC average in Enabling Trade Index; among developing economies, only Malaysia was above the APEC average (APEC Policy Support Unit 2013d).

The focus of the analysis is about strengths, weaknesses, opportunities, and threats on integrating SMEs into global value chains. Chapter 3 listed MNCs' decisions on selecting SME partners in relation to the expectations and requirements on SMEs, as well as factors contributing to the long term success of the relationship. The analysis compares the five sectors selected in this study against each other in the SWOT analysis on product attributes, company attributes, as well as external factors and lastly, some industry-specific external factors. Soft strengths are not included, as business integrity could be only assessed in the long term, and it is a factor that will build the reputation of a firm in the long run that impacts on the firm's survival in the value chain. CSR is a rising factor that will facilitate the engagement of SMEs with MNCs, but it is not a defining factor for SMEs to be successfully incorporated into a GVC. Additionally, the internal factors are not included, because they are actions taken by MNCs to ensure the relationship is progressing in the right direction, and not necessarily a factor impacting an SME's entrance into GVCs.

Tables 8 to 17 present the illustrative analysis on integrating SMEs into GVCs in the APEC region. For each sector, two SWOT matrices are constructed – one on SMEs in APEC developed and newly-industrialized economies and the other on SMEs in APEC developing economies.

Table 8 SMEs' Entrance in Agriculture GVC: Developed and Newly-industrialized Economies

Strengths	Weaknesses
[Product price] Productivity is high and overrides the effect of high labor costs; SME farmers can provide agricultural products at competitive price. **[Product quality]** SMEs have strict quality control, and product quality is consistent and reliable. **[Product delivery]** Products are well packaged and SMEs have access to necessary transportation facilities and cold chains to ensure delivery. **[Financial soundness]** Farmer associations are common and provide financial management expertise and support to SME farmers.[16] Also governments have financial programs in place. **[Production capacity]** SMEs have high production capacity due to wide mechanization and application of more productive technologies. **[Geographic location]** SME producers are located close to natural resources as inputs for production, and some SMEs are also close to consumers. **[ICT level of business operation]** ICT infrastructure is readily available, so SMEs enjoy high level of informatization. **[Talent and innovative capacity]** SME farmers have first-hand production information and develop creative techniques to improve production.	**[Standards and certificates]** SMEs may be aware of international standards, but do not participate much in the certification. **[Flexibility]** High mechanization limits the ability of SMEs to adjust their production.
Opportunities	**Threats**
[Business environment] Business environment is generally sound, with competition, transparent rules and regulations, and trade facilitation. **[Physical and informational infrastructure]** Advanced infrastructure promotes business activities. **[Agriculture-specific external factors]** Consumers increasingly demand high quality diversified agricultural products. Food security has become an important topic, policies and regulations will improve regulatory environment on agricultural business.	**[Business environment]** Agricultural production requires large initial capital and land inputs, so entry barriers are high. **[Agriculture-specific external factors]** Natural disasters, extreme weather events, as well as outbreaks of pests and diseases are potential threats. Protectionism is still high in agricultural trade.

[16] Agricultural and food cooperatives represent a significant portion of the global cooperative sector in developed and developing economies (FAO n.d.). Agricultural cooperatives are important in the developed world, and an increased need for coordination in agricultural production chain changes the role of cooperatives in the developed world (Bachke 2009).

Table 9 SMEs' Entrance in Agriculture GVC: Developing Economies

Strengths	Weaknesses
[Product price] SMEs offer agricultural products at a competitive price. **[Geographic location]** SME producers are located close to natural resources as inputs for production, and some SMEs are also close to consumers. **[Flexibility]** With a lower level of mechanization, SMEs tend to adjust their production within the constraints of production technology. **[Talent and innovative capacity]** SME farmers have first-hand production information and develop creative techniques to improve production.	**[Product quality]** Quality control is weak, and product quality is inconsistent and on occasions low. **[Product delivery]** SMEs lack product packaging techniques and skills, and have limited access to proper transportation means (cold chains, etc.). **[Financial soundness]** SME farmers are not organized and face difficulties in accessing external finance. A large amount of capital is locked in production due to seasonality of farming. **[Production capacity]** SMEs have lower production capacity due to limited mechanization and lacking of technology. **[Standards and certificates]** SMEs are less aware of or struggle to meet international standards and certificates. **[ICT level of business operation]** Many SME farmers have no access to ICT infrastructure. Low education levels also constrain their use of ICT.
Opportunities	**Threats**
[Business environment] Business environment is improving, especially in trade facilitation. Sector entry barrier is lower in developing economies. **[Agriculture-specific external factors]** Consumers increasingly demand high quality diversified agricultural products. Food security is an important topic, and policies and regulations will improve the regulatory environment. A growing number of public-private partnerships in agricultural R&D introduce new technologies and new products (International Food Policy Research Institute 2005).	**[Physical and informational infrastructure]** Lack of appropriate infrastructure slows down the transportation and shipping of perishable products. **[Agriculture-specific external factors]** Natural disasters, extreme weather events, as well as outbreaks of pests and diseases are potential threats. Protectionism is still high in agricultural trade.

Table 10 SMEs' Entrance in Food Processing GVC: Developed and Newly-industrialized Economies

Strengths	Weaknesses
[Product quality] Food processing SMEs have strict quality control, and product quality is consistent and reliable. **[Product delivery]** Products are well packaged and SMEs have access to necessary transportation facilities and cold chains to ensure delivery. **[Financial soundness]** Food processing SMEs are either farmers or closely linked to farmers; hence they are part of, or work closely with, farmer associations. Therefore, SMEs can achieve sound financial status and potentially gain access to government support. **[Production capacity]** SMEs have high production capacity due to adoption of more productive technologies. **[Geographic location]** Food processing SMEs are located close to major customer markets. **[ICT level of business operation]** ICT infrastructure is readily available, so SMEs enjoy high level of informatization. **[Talent and innovative capacity]** Food processing SMEs are close to consumers and tend to improve products based on consumer preferences.	**[Product price]** Labor costs are high, pushing up the food product price. **[Standards and certificates]** SMEs may be aware of international standards, but do not participate in the certification. **[Flexibility]** High level of mechanization limits the ability of SMEs to adjust production lines.
Opportunities	**Threats**
[Business environment] Business environment is sound, with competition, transparent rules and regulations, and trade facilitation. **[Physical and informational infrastructure]** Advanced infrastructure promotes business activities. **[Food processing-specific external factors]** Consumers increasingly demand high quality diversified agricultural products. Food security is important and policies and regulations will improve regulatory environment.	**[Business environment]** Food processing requires large initial capital and labor inputs, so entry barriers are high. **[Food processing-specific external factors]** Food processing relies on agricultural products as inputs, thus natural disaster and outbreaks of pests and disease threaten food processing SMEs. Food contamination risk is high with prolonged value chains.

Table 11 SMEs' Entrance in Food Processing GVC: Developing Economies

Strengths	Weaknesses
[Product price] SMEs offer food products at a competitive price. **[Geographic location]** SME producers are located close to major consumer markets. **[Flexibility]** SMEs adjust production techniques within the constraints of production technology. **[Talent and innovative capacity]** Food processing SMEs are close to consumers and improve products based on consumer preference.	**[Product quality]** Quality control is weak, and product quality is inconsistent and on occasions low. **[Product delivery]** SMEs lack product packaging techniques and skills, and have limited access to proper transportation means (cold chains, etc.). **[Financial soundness]** Access to finance is one of the major difficulties for SME businesses. **[Production capacity]** SMEs have limited production capacity due to low mechanization and lacking of technology. **[Standards and certificates]** SMEs are less aware or struggle to meet international standards and certificates. **[ICT level of business operation]** SME owners have limited access to education, thus constraining their capability to conduct businesses online.
Opportunities	**Threats**
[Business environment] Business environment is improving, especially in trade facilitation. **[Food processing-specific external factors]** Consumers increasingly demand high quality diversified agricultural products. Food security is an important topic, and policies and regulations will improve regulatory environment on agricultural business.	**[Business environment]** Food processing requires large initial capital and labor inputs, so entry barriers are high. **[Physical and informational infrastructure]** Lack of appropriate infrastructure slows down the transport and shipping of perishable products. **[Food processing-specific external factors]** Food processing relies on agricultural product as inputs, thus natural disasters and outbreaks of pest and disease also threaten food processing SMEs. Food contamination risk is high with prolonged value chains.

Table 12 SMEs' Entrance in Automobile GVC: Developed and Newly-industrialized Economies

Strengths	Weaknesses
[Product quality] SMEs can meet high quality requirements of the auto lead firm. **[Product delivery]** Auto parts and components have low requirements on product delivery, so SMEs can ensure product delivery. **[Production capacity]** SMEs have high production capacity due to adoption of more productive technologies. **[Standards and certificates]** Auto parts producers are certified by international standardization bodies. **[ICT level of business operation]** SMEs enjoy high level of informatization. **[Talent and innovative capacity]** SMEs specialize in producing parts and components, and accumulate experience and knowledge to improve production.	**[Product price]** Labor costs are high, pushing up auto production price. **[Financial soundness]** SMEs are captive to the lead firm, therefore facing high risk of overdependence on the lead firm. **[Flexibility]** High mechanization limits the ability of SMEs to adjust their production. **[Geographic location]** Automotive SMEs are located outside major auto markets, and are disadvantaged by market entry barriers.
Opportunities	**Threats**
[Business environment] Business environment is sound, with high competition, transparent rules and regulations, and measures to facilitate trade. **[Physical and informational infrastructure]** Advanced infrastructure promotes business activities.	**[Business environment]** Auto parts production requires large initial capital and labor inputs, so entry barriers are high. **[Automobile-specific external factors]** Automobile markets are becoming saturated, thus car purchasing will slow down. Natural disasters may disturb production of auto parts and components.

Table 13 SMEs' Entrance in Automobile GVC: Developing Economies

Strengths	Weaknesses
[Product price] Low labor costs give SMEs a big advantage. **[Product quality]** Auto lead firms impose high quality standards, thus SMEs can meet quality requirements. **[Product delivery]** Auto parts and components have low requirements on product delivery, therefore SMEs can deliver on time and at right place. **[Production capacity]** Production capacity is high due to wide mechanization and low labor costs. **[Geographic location]** SMEs are located close to emerging markets, with bright market prospects. **[ICT level of business operation]** SMEs in auto sector are medium scale, and enjoy high level of informatization. **[Talent and innovative capacity]** SMEs specialize in producing parts and components, and accumulate experience and knowledge to improve production.	**[Financial soundness]** SMEs are captive to the lead firm, therefore facing high financial risk of overdependence on the lead firm. **[Standards and certificates]** SMEs have difficulty in getting international certification. **[Flexibility]** High mechanization limits the ability of SMEs to adjust their production.
Opportunities	**Threats**
[Business environment] Business environment is improving, especially in trade facilitation. **[Physical and informational infrastructure]** Infrastructure to support automobile business is improving. **[Automobile-specific external factors]** Automobile markets in developing economies are expanding exponentially.	**[Business environment]** Auto parts production requires large initial capital and labor inputs, so entry barrier in this sector is high. **[Automobile-specific external factors]** Natural disasters may disturb production of auto parts and components.

Table 14 SMEs' Entrance in Electronics GVC: Developed and Newly-industrialized Economies

Strengths	Weaknesses
[Product quality] SMEs can produce high quality electronics parts and components. **[Product delivery]** Good infrastructure to ensure product delivery. **[Financial soundness]** Due to high modular nature, SMEs are not captive to the lead firm Some get financial support from government that encourages knowledge-based economy. **[Production capacity]** Production capacity is high, due to high level of mechanization and modular nature of electronics parts and components. **[Flexibility]** The modular nature of electronics parts and components allow more production flexibility. **[Standards and certificates]** SMEs tend to participate in international certification. **[ICT level of business operation]** SMEs enjoy high level of informatization.	**[Product price]** Labor costs are high, pushing up electronics production price. **[Geographic location]** Electronics production is less constrained by geographic location, but high labor costs disadvantage the SMEs in developed markets. **[Talent and innovative capacity]** SMEs face difficulties attracting high-technology professionals to maintain their innovative capacity.
Opportunities	**Threats**
[Business environment] Business environment is sound, with high competition, transparent rules and regulations, and measures to facilitate trade. The industry is innovation driven, therefore entry barriers are low. **[Physical and informational infrastructure]** Advanced infrastructure promotes business activities.	**[Electronics-specific external factors]** Natural disasters may disturb production of electronics parts and components.

Table 15 SMEs' Entrance in Electronics GVC: Developing Economies

Strengths	Weaknesses
[Product quality] SMEs can produce high quality electronics parts and components. **[Product price]** Low labor costs give SMEs a big competitive edge. [**Product Delivery**] SMEs tend to produce simple and low-technology electronic components, which have low requirements on delivery. **[Financial soundness]** Due to high modular nature, SMEs are not captive to the lead firm. Some get financial support from the government that encourages knowledge-based economy. **[Production capacity]** Production capacity is high, due to high level of mechanization and modularity of electronics parts and components. **[Flexibility]** The modular nature of electronics parts and components allow more production flexibility. **[Geographic location]** SMEs are located close to emerging markets. **[ICT level of business operation]** SMEs enjoy high level of informatization.	**[Standards and certificates]** SMEs have difficulty in getting international certification. **[Talent and innovative capacity]** SMEs face difficulties attracting high-technology professionals to maintain their innovative capacity.
Opportunities	**Threats**
[Business environment] Business environment is improving, especially in trade facilitation. The industry is innovation-driven, therefore entry barrier is relatively low. **[Physical and informational infrastructure]** Infrastructure to support electronics businesses is improving.	**[Electronics-specific external factors]** Natural disasters may disturb production of electronics parts and components.

Table 16 SMEs' Entrance in Handicraft GVC: Developed and Newly-industrialized Economies

Strengths	Weaknesses
[Product quality] SMEs produce high quality handicraft products. **[Product delivery]** Products only require simple packaging and SMEs can ensure product delivery. **[Standards and certificates]** SMEs have high awareness of standards and certificates, and participate in certification. **[Flexibility]** Handicraft production is flexible relative to other sectors. **[ICT level of business operation]** SMEs enjoy high level of informatization. **[Talent and innovative capacity]** SMEs are creative and innovative.	**[Product price]** Labor costs are high, pushing up handicraft prices. **[Financial soundness]** SMEs are captive to the lead firm, therefore facing high financial risk of overdependence on the lead firm. **[Production capacity]** Production capacity is low, because low level of mechanization and heavy reliance on labor. **[Geographic location]** Though close to consumers, high labor costs disadvantage SMEs in developed markets, and SMEs may face difficulties in accessing raw inputs.
Opportunities	**Threats**
[Business environment] Business environment is sound, with high competition, transparent rules and regulations, and measures to facilitate trade. Handicraft sector has low entry barrier. **[Physical and informational infrastructure]** Advanced infrastructure promotes business activities.	**[Handicraft-specific external factors]** Natural disasters may disrupt handicraft production.

Table 17 SMEs' Entrance in Handicraft GVC: Developing Economies

Strengths	Weaknesses
[Product quality] SMEs produce high quality handicraft products. **[Product price]** Low labor costs give SMEs a big advantage. **[Product delivery]** Products only require simple packaging and SMEs can ensure product delivery. **[Production capacity]** Production capacity is higher thanks to low labor cost. **[Flexibility]** Handicraft production is flexible relative to other sectors. **[Geographic location]** Low labor costs strengthen SMEs competitiveness. **[Talent and innovative capacity]** SMEs are creative and innovative.	**[Financial soundness]** SMEs are captive to the lead firm, therefore facing high financial risk of overdependence on the lead firm. **[Standards and certificates]** SMEs have difficulty in getting international certification. **[ICT level of business operation]** SMEs may not have access to ICT infrastructure and are limited by their education and knowledge.
Opportunities	**Threats**
[Business environment] Business environment is improving, especially in trade facilitation. Handicraft sector has low entry barrier. **[Physical and informational infrastructure]** Infrastructure to support food-processing business is improving. **[Handicraft-specific external factors]** Developing economies are rich in culture and high-end market elements.	**[Handicraft-specific external factors]** Natural disasters may disturb handcraft production.

Table 18 is a summary of the above SWOT analysis. Based on this illustrative analysis and assuming equal weights to all factors, it is evident that for SMEs in developed and newly-industrialized economies, it is easier to participate in GVCs concerning agriculture and electronics; for SMEs in developing economies, the electronics and handicraft GVCs are the value chains with better potential to enter.

In addition, the analysis shows that SMEs participating in agriculture and food processing GVCs have similar strengths, weaknesses, opportunities and threats; therefore, it is advisable to combine the two value chains together as an agro-business GVC. Particularly, for SMEs in developing economies, they face difficulties to be part of the GVC in the agriculture and food processing sectors, as problems in maintaining homogeneous product quality and lack of access to finance are two critical factors restricting their participation.

Table 18 Potentials for SMEs to Participate in Global Value Chains

Factors	SMEs in developed and newly-industrialized economies					SMEs in developing economies				
	Agriculture	Food processing	Automobile	Electronics	Handcraft	Agriculture	Food processing	Automobile	Electronics	Handcraft
Product quality	✓	✓	✓	✓	✓	×	×	✓	✓	✓
Product price	✓	×	×	×	×	✓	✓	✓	✓	✓
Product delivery	✓	✓	✓	✓	✓	×	×	✓	✓	✓
Financial soundness	✓	✓	×	✓	×	×	×	×	✓	×
Production capacity	✓	✓	✓	✓	×	×	×	✓	✓	✓
Flexibility	×	×	×	✓	✓	✓	✓	×	✓	✓
Geographic location	✓	✓	×	×	×	✓	✓	✓	✓	✓
Standards and certificates	×	×	✓	✓	✓	×	×	×	×	×
ICT level of business operation	✓	✓	✓	✓	✓	×	×	✓	✓	×
Talent and innovative capacity	✓	✓	✓	×	✓	✓	✓	✓	×	✓
Business environment	o	o	o	✓	✓	✓	o	o	✓	✓
Physical and informational infrastructure	✓	✓	✓	✓	✓	×	×	✓	✓	✓
Sector-specific external factors	o	o	×	×	×	o	o	o	×	o

Source: Author.

Note: ✓ = factor shown as a strength or an opportunity, × = factor shown as a weakness or a threat, o = factor shown as both opportunity and threat.

The SWOT analysis involves an unavoidable degree of subjectivity; therefore, it is possible that the sets of attributes and factors could be weighted in different ways and lead to different conclusions. Researchers could assign different weights on attributes and factors to reflect their level of importance and explore different scenarios in SWOT analysis.

Box Identify Sector with Highest Potential

To identify the sector with the highest potential for SMEs to join GVCs, the product-specific prospects of these GVCs could be examined. Agricultural and food products are daily necessities, while handicraft products are luxury goods, and automobile and electronics products are in between the two. This implies that for SMEs to participate in the respective chains, demand for agricultural and food products will grow consistently despite market situations; while demand for handicraft products will fluctuate according to macroeconomic conditions. Demand for electronics products is in between the two, meaning demand expands or slows according to the economic boom and bust cycles, but does not fluctuate as drastically as handicraft products. The demand for automobiles is mixed, with the demand for standard cars more similar to the demand for electronics, whilst the demand for luxury cars reacts closely to the demand of handicraft products.

From this perspective, participation in the agriculture GVC has a lower-level risk than the electronics GVC, and participation in the handicraft GVC has the highest economic risk. Therefore, the agriculture GVC would offer SMEs in developed and newly-industrialized economies more potential and electronics GVC would offer SMEs in developing economies more potential.

Again, given the generalization of SME profiles on the regional level, this conclusion is illustrative and not definitive.

The analysis in this chapter is based on the overall perspective of the APEC region. For individual economies, the results may not be the same due to different resource endowments and market conditions. Similarly, on an industry level, the results may differ depending on which products are analyzed. For example, in the agriculture GVC, aquaculture products would have more strict requirements on handling, packaging, and shipping capacities than fruit and vegetables. In this regard, a similar analysis could be conducted to analyze specific economies, sectors and products in order to obtain more concrete results.

CHAPTER 5 POLICY PRINCIPLES AND BEST PRACTICES

As 'integration of trade' and 'disintegration of production' become concurrent phenomena (Feenstra 1998), GVCs are playing a more prominent role in the international trading system. SMEs' participation in GVCs benefits the MNC lead firms and the SME suppliers, and also the local economies where the SME suppliers reside. As one of APEC's next generation trade and investment issues, enhancing SMEs' participation in global value chains will strengthen the competitiveness of SMEs in the region, and enable them to contribute further to economic development and regional integration.

This paper first clarified the concept of GVCs and discerned some critical structural changes of GVCs that have been taking place since the global financial crisis. The paper then examined the current situation and features of GVCs in five key sectors where SMEs have a high interest to participate. The five sectors, identified by the SME Working Group, cover agriculture, food processing, automobile, electronics and handicrafts. The analysis in this paper shows frequent overlaps between food processing and agriculture GVCs; therefore it is advisable to combine both GVCs into an integrated agro-business GVC in future studies.

The paper also discussed different governance structures of value chains, economic relationships within the value chains, as well as the expectations and requirements of MNCs on their SME suppliers. Based on MNCs' selection criteria on their SME suppliers, the paper provides an illustrative example to compare the prospects for SMEs to participate in the GVCs of the five key sectors. The illustrative analysis showed that for SMEs in developed and newly-industrialized economies, the agriculture and electronics GVCs offer the highest potential to participate; and for SMEs in developing economies, the electronics and handicraft GVCs offer the highest potential to participate. However, due to the high level of generalization of SMEs' profiles at the regional level, the conclusion should be taken as illustrative but not definitive.

Large heterogeneity exists among different GVCs. Consequently, there are no 'one size fits all' policies to integrate SMEs into GVCs, and policies should be tailored to specific economic situations. The prospects for SMEs to participate in GVCs are influenced by various factors, such as product attributes, company attributes, and external factors. Hence, it is recommended to assess the possible participation of SMEs into GVCs at a micro or industry or product level.

Taking this heterogeneity into account and in light of the discussion in the previous chapters, the following paragraphs lay out policy principles and best practices for integrating SMEs into GVCs. The policy principles and best practices follow the structure of MNCs' expectations and requirements on SME suppliers.

Product Attributes

Product quality, price and delivery are business decisions of SMEs, to which governments should apply a laissez-faire approach without direct involvement in them. However, policymakers can improve access to market information to help SMEs and MNCs make more informed decisions.

Product attributes are the top criteria to determine if an SME fits into a specific value chain, and SMEs need to have a correct understanding of the global markets and business of GVCs to produce goods with the right quality, competitive price and capacity for delivery. As noted by the OECD, lack

of knowledge about international markets is a major reason for SMEs not to engage in international trade (OECD 2009b). In this regard, governments could set up exchange platforms such as trade fairs, conferences, forums, advisory centers or online platforms, to bridge the information gap between MNCs and SMEs (Conference Board of Canada 2009). These will help SMEs to build awareness and understanding of GVCs as well as requirements to participate in GVCs. SMEs can also collect market information on product quality, price and delivery requirements from this type of exchange; check their products against market trends; and identify their potential competitive strengths to participate in GVCs.

Company Attributes

Company attributes reflect the stability and sustainability of SME businesses, which the MNC lead firms would take into consideration when selecting SME suppliers.

a. Financial soundness

Financial soundness is one of the major weaknesses of SMEs across GVCs. SMEs face challenges to access external financial resources, which in turn limit their investment in developing new products, upgrading existing production, and capturing emerging business opportunities. Governments can reduce financial constraints on SMEs through encouraging supply chain finance, which covers receivables financing, physical asset collateralization, risk-mitigation products, securitization, and guarantee instruments, among others (Hartmann 2012). In addition, lack of working capital restricts operations of SMEs. Financial skills training for SME owners could be very helpful for SMEs working with scarce working capital.

b. Production capacity

In SMEs, production capacity is limited by the availability of labor and capital. However, by encouraging collaboration and clustering, SMEs could achieve collective efficiency and economies of scale, and expand overall production capacity. In addition, by working together, this increases SMEs' bargaining power in purchasing raw materials, and improves chances for SMEs to win bids from MNCs. Governments can also work with MNCs to study and identify the competitive advantages of the local economy, determine what kind of clusters to set up, and what kind of facilities to provide.

c. Standards and certification

Meeting international standards and acquiring international certification are challenging for SMEs, especially when they are facing financial constraints. At the regional level, APEC economies should continue efforts to harmonize standards and conformance procedures, improve mutual recognition of standards, and reduce potential cost of meeting numerous diverging standards. At the economy level, governments could set up public certification systems to certify SMEs on product, production, and process standards, and to ensure that no excessive burden are borne by SMEs. In addition, training and technical assistance on qualification and certification processes could be provided to SMEs to help them identify gaps in meeting or acquiring them.

d. Flexibility

Improving business flexibility requires both adequate capital and human resources. Integrated services, such as ensuring finance to obtain necessary technology, together with proper training for adaptation of the technology, are more effective in improving production flexibility than providing finance or training alone.

e. Geographic location

When MNCs assess the geographic location of SMEs, they look at proximity to consumer markets, and the SMEs' understanding of local market conditions. Policymakers may not want to directly involve themselves in the location decisions of SMEs. However, they can ensure macroeconomic stability, market openness, and transparence of the rule of law, which are necessary conditions to attract MNCs.

f. ICT level of business operation

ICT level of business operation determines whether, and in which kind of GVCs, SMEs could participate. It is important that governments nurture a domestic ICT skill base in the workforce by incorporating ICT classes in student curriculum and vocational training programs. In addition, technology hubs and technology incubation centers could showcase the latest technology available to SMEs, build their knowledge on exisiting technologies, and governments could help SMEs to adapt to such technologies. ICT can help SMEs to increase their productivity.

g. Talent and innovation capacity

Talent and innovation capacity are key to the successful participation of SMEs in GVCs (OECD 2008). Especially for SMEs in sectors requiring a relatively high technology level, constant innovation is necessary to enter and stay in the GVCs. Governments could play a catalytic role in facilitating collaboration and dialogue between universities and SMEs, so that universities could provide innovative ideas and SMEs could commercialize such ideas into business strategies (Helewood and Surya 2012). In addition, SMEs also face challenges in managing their intellectual assets. Participating in GVCs means that SMEs have to maintain transparency to MNCs. For example, product design and planning is shared with MNCs. It is important to ensure that MNCs compensate SMEs fairly for using SMEs' intellectual assets.

External factors

External factors affect competitiveness of domestic SMEs and hence their integration into the GVCs. An enabling environment with clear rules and regulations as well as sound infrastructure will help SMEs to gain competitiveness and take up roles in GVCs.

a. Business environment

A sound domestic business environment will attract MNCs to set up their GVCs. Policymakers should strengthen local institutions to facilitate business activities along GVCs. This means to streamline customer procedures, improve transparency and coherency in rules and regulations, and fight corruption and graft. The competitiveness of the GVC depends on the technology level and resource endowments of all the economies where domestic SMEs participate in the chain and provide goods and services for the chain. The strength of the GVC is equivalent to the strength of its weakest link.

Trade policy instruments, such as reducing import tariffs, simplifying rules of origin, and dismantling non-tariff barriers, facilitate and liberalize international trade, which reduce trade costs and create a favorable environment for GVCs to expand and for SMEs to participate in them. Hence, APEC governments should continue the efforts in trade facilitation and liberalization.

b. Physical and informational infrastructure

Roads, ports, warehouses, telecommunications and internet connections in good condition reduce transaction costs and facilitate expansion of GVCs. Services, especially logistics, are critical in

linking players with GVCs, and effective services rely on existing physical and informational infrastructure. The development of physical and informational infrastructure should not be confined to behind-the-border links or networks, it should also improve cross-the-border infrastructure. Through region-wide cooperation on regional infrastructure development and policy coordination, APEC economies could provide an enabling environment for SMEs to enter into GVCs.

Nurturing SME clustering and networking is an effective way to develop physical and informational infrastructure, as collective facilities can strengthen vertical links between MNCs and SMEs, as well as horizontal links among SMEs. In addition, improving informational infrastructure encourages learning among SMEs, strengthens their innovative capacity, and sustains their position in the GVCs.

c. Sector-specific external factors

Natural disasters and pandemic outbreaks disrupt production activities and impose a high risk on almost all GVCs. Pests and diseases can seriously jeopardize the agriculture and food processing GVCs. MNCs, as lead firms of GVCs, are actively diversifying their supplier base and reducing the risk from natural disasters and pandemics. Policymakers could also play an active role in managing risk and reducing the impact of disasters. Policymakers could map GVCs within their economy, identify players and connection points that are potentially under threats, and improve emergency preparedness and disaster relief efforts. Other APEC fora could work closely with the APEC Emergency Preparedness Working Group on enhancing regional supply chain resilience to disasters through active dialogue, experience sharing, and cooperation among member economies.

Particularly, in terms of trade barriers, agricultural products often face the highest tariffs and non-tariff measures. Policymakers are encouraged to find ways to reduce barriers on agricultural trade, which will assist development of both the agriculture and food processing GVCs. Other sectors could also be approached in the same way. For example, for electronics products, although trade barriers have been falling, there is room for further reduction of tariffs. Also, APEC members are encouraged to participate in the negotiation on the expansion of the WTO Information Technology Agreement.[17]

Working at Two Levels

Policies to integrate SMEs into GVCs are needed on two levels: 1) general/horizontal level, and 2) industry level.

On the general level, governments could establish programs to promote awareness and understanding of the benefits of integrating SMEs into GVCs, and to work with MNCs to develop more specific capacity building programs for local SMEs. One way to do this is by promoting the establishment of SME innovation centers across the APEC region that could serve as places to incubate ideas and obtain proper advisory services from experts. The AEPC SME Innovation Center established in Korea in 2006 has provided advice to 96 companies in seven APEC economies. One of its success stories is the case of an Indonesian company, Remula Inti Rekayasa, which was able to streamline its manufacturing process and provide stainless steel tanks for food and pharmaceutical companies such as Coca Cola and Sanbe Farma (APEC Secretariat 2013).

On the industry level, policymakers need to fully understand how GVCs are or could be linked with the domestic economy; identify strengths, weaknesses, opportunities and threats for domestic SMEs to enter into GVCs; and then lay out correct policy tools and/or packages to enhance the integration of

[17] The current ITA covers some obsolete IT products, but does not cover some modern and newly-emerged products.

SMEs in GVCs. Governments should refrain from direct involvement in the business activities of SMEs with an aim to help SMEs to join in GVCs, because such direct involvement will distort market signals and undermine market competition.

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