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The association of interaction capabilities and SMEs' participation in high value manufacturing (HVM) global value chains (GVCs)

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Abstract

UK SMEs play a significant role to its country in terms of number of enterprises, employment and value added. Increasing their participation in HVM GVCs will bring sustainable growth to the country. To participate in these chains, certain competencies need to develop by SMEs. However, development of capabilities among SMEs has not been widely explored. A conceptual framework of SMEs' participation in high value manufacturing (HVM) global value chains (GVCs) has been developed with the aim of examining which type of interaction capabilities are required by SMEs to increase their participation.

Keywords: Operations strategy, small medium enterprises (SMEs), capabilities, manufacturing

Introduction

The phenomenon of globalisation is not new, rather it became a catchword in the late 20th century (Gereffi et al. 2001). The word globalisation has given significant meaning to each firm and country. It may only provide opportunities and/or challenges to each country. Globalisation has permitted the integration and inter-connection of international economy.

The phenomenon of globalisation has been facilitated by the advancement of information communication technologies (ICT), vast improvement in transport technologies and infrastructure, trade liberalisation and open economic policies (Sainsbury 2007; OECD 2007b). Indeed, these drivers have opened up new markets such as Brazil, Russia, China and India (BRIC). They have created opportunities for Europe to do more exports by expanding their operations to new and larger markets with cheaper inputs, intermediates and lower prices for consumers.

However, the emergence of these low cost countries is not coming without any challenges to developed economies such as the United Kingdom (UK) and the United States (US). Developed economies need to compete with these emerging markets as they have brought workaholic, motivated and fairly cheaper workforce to this globalised world, this has driven the movement of activities from Europe and the US to Asia (Sainsbury 2007).

Competing against the costs will not bring any benefits to the developed economies. The UK believe that they are unable to compete with these emerging economies in terms of costs alone as every day brings new low cost producers to the markets (Sainsbury 2007). They are not only able to provide low costs but also capable in producing high volume and low value added products. Therefore, in order for the UK to reap the opportunities of globalisation, firms need to compete against high value goods, services and industries (Sainsbury 2007).

The rapid pace of globalisation is also driven by the fragmentation of manufacturing. Traditionally, all activities from upstream to downstream are managed by large factory. However, within this context, activities have been fragmented across locations as to reap the benefits of location advantages (Lim & Kimura 2010; Sainsbury 2007). For the UK to be highly competitive, they need extend their view of manufacturing to more than just a view of production. Manufacturing should not be viewed as only production that involves unskilled labours who perform repetitive jobs but it should encompass of production, research and development (R&D), design, logistics, distribution and service provision (Livesey 2006; Sainsbury 2007).

To ensure the competitiveness of UK manufacturing, it is essential for the companies to deliver high value to various parties that include country, investors, employees and their shareholders. Companies who are able to move up the value chain can be described as high value manufacturers (Livesey 2006). This implies the core concept of high value manufacturing (HVM). In the UK, HVM has been defined as “the application of leading-edge technical knowledge and expertise to the creation of products, production processes, and associated services which have strong potential to bring sustainable growth and high economic value to the UK” (Technology Strategy Board 2012).

In order to upgrade the role of UK manufacturing, new knowledge is needed to produce new product, process, service or technology. Companies may face several challenges to secure the materials as well as to take up the risks to achieve it. Here, SMEs need to play its vital role by connecting companies in the global value chain (GVC) (Technology Strategy Board 2012). In the GVCs structure, often, SMEs appear as lower-tier suppliers who supply inputs or intermediates to large manufacturing companies. A global value chain entails a broad range of value-added activities that are related to production, exchange, distribution and after sales services for a product or service that disperse geographically (Abonyi 2005).

GVC becomes important feature in the world economy. As globalisation, it also brings its own opportunities as well as challenges. Participate in GVCs has allowed companies to expand their markets; and increase productivity and efficiency (OECD 2007b; Abonyi 2005). Working with other parties from upstream or downstream value chains will enable companies to increase knowledge and learn know-how. The opportunities seem to have benefited many multinational enterprises (MNEs) due to large financial that they acquire. In contrast, participation of SMEs in GVCs have caused them to face numerous challenges such as lack of investment skills, ICT and entrepreneurship skills and expertise, inability to protect in-house technology and inability to adapt to international standards and practices (Harvie 2010; OECD 2007b; Abonyi 2005). These problems have caused difficulty for SMEs to tap into GVCs and cooperate with MNEs. It is becoming

even more significant to upgrade the role of SMEs in HVM GVCs as there were 5.4 million SMEs in the UK in 2015 and 5 per cent of them involved in manufacturing (Rhodes 2015).

A growing amount of literature has focused on enhancing SMEs' participation in GVCs (Abonyi 2005; Lunati et al. 2008; OECD 2007a; Harvie 2010; Yuhua & Bayhaqi 2013; Yuhua 2014). Nevertheless, these studies have only focussed on various policies to facilitate SMEs in developing countries. To face above challenges, SMEs need to equip with certain "competencies".

For firms to carry out activities, they need resources and these resources can be divided into tangible and intangible resources. Competency is one of the intangible resources that cannot be touched and it needs to be built by firms in the organisation. Competence can be described as the ability of a firm to perform in a specific field and this competence can be in the form of knowledge, capabilities and attitude (Wit & Meyer, 2004). Therefore, the objective of this study is to investigate which type of interaction capabilities are required by SMEs to participate in HVM GVCs. Particularly, this paper seeks to answer the question on:

"Why are some UK SMEs more successful than others at participating in HVM GVCs?"

No attempt has been made yet to link capabilities and SMEs' participation that will be the contribution of the study.

The conceptual framework adopted in this study is discussed in the next section; first, discussing on how SMEs measure increase in participation; second, the capabilities to increase SMEs' participation in HVM GVCs; third, business performance. This is followed by research methodology and contribution.

Conceptual Framework

Measuring increase in SMEs' participation

A number of studies have covered the benefits that SMEs can reap from involving in GVCs. However, no attempt has yet been made in the literature to discuss on how SMEs measure their increase in participation. Thus, in this study, four variables that are industry, product range, geographic scale and value chain activities have been identified to explain the increase in participation as presented in Table 1-1.

An industry has been defined as a group of firms that produce similar types of products or work on related value-chain processes or resources (Wit & Meyer, 2004). For instance, British Airways, EasyJet and Ryanair can be said to be working in the same product in the airlines industry. In the GVC structure, it is impossible to have only one industry but it involves multiple industries that produce different type of products. Take the example of British Airways in airline industry. In order for British Airways to operate, it needs to have aircrafts in which these aircrafts can be manufactured by aircraft manufacturing industry such as Boeing. To manufacturer the aircrafts, Boeing requires million parts for its seat, engines, wings and fuselage. These parts come from various suppliers across the world. In one of the chains, SMEs may position themselves as second or third-tier suppliers that involve in one particular industry. SMEs who have capabilities may able to expand their operations by integrating in more than one industry.

Product range is the second variable to measure SMEs increase in participation. SMEs who have relevant capability may able to provide variety of products. In parallel, SMEs also able to meet the primary goals of business units that are market oriented. In this study, market oriented is defined as firms who are responsive to the specific market demand (Williams et al. 1995). The widened range of product has been experienced by ENGTEK who is a global supplier of computer hard disk and the semiconductor

industries. Several factors have influenced ENGTEK from nobody to a high precision manufacturer and one of them is through partnerships. Partnerships with multinational corporations (MNCs) have allowed ENGTEK to acquire technology that enable diversification of its product from precision tools into manufacturing of disk-drive components (UNCTAD 2001). This supports other study that shows a negative association between successful new venture firms and narrow product range (Deane et al. 1991).

Furthermore, participation can also be measured in terms of the geographic scale. The spatial scale can be increased from being local supplier who operates in the commute area to being domestic supplier who serves single country. This type of supplier is also known as industrial district (ID) firms (Sturgeon 2000). These firms can compete at national or international level by exploiting the specificities of local supply networks and gain competitive advantage through the organisations of value chains (Chiarvesio & Di Maria 2009). This structure can continue to increase in international, regional and global market. In this context, international covers more than one country whilst regional confines the operations to multi-countries trade bloc such as Association of Southeast Asian Nations (ASEAN). The last scale is global-scale which denotes the geographic reach but does not require volume of activity or total geographic coverage in every country, region or every continent (Sturgeon 2000). A wide number of knowledge has discussed about globalisation but it still lacks of consensus definition. Thus, literature has analysed the term globalisation in three different levels; micro, *meso* and macro. The first level is globalisation of companies. This is where firms have global strategy, structure, culture, workforce, management team and resource base. Second, globalisation of businesses that focuses on particular businesses and third, globalisation of economies that implies the macroeconomic dynamics of international integration (Wit & Meyer 2004). The successful firms may able to increase their operations from serving limited market to broader market (Deane et al. 1991).

In addition, SMEs' participation can also be measured in terms of value chain activities. Firm' value chain activities is different from industry to another industry. In the automotive industry, the simple value activity might encompass of first assembly, assembly line that includes welding, painting, assembling and distribution. However, in textile and apparel value chain activities can be divided into five main parts that are raw material supply, provision of components, production networks, export channels and marketing networks. SMEs able to increase their participation from being focused at extraction of raw materials such as cotton, wool and silk to another level of spinning, knitting, and finishing (Gereffi & Memedovic 2003; Humphrey 2003).

Table 1-1: SMEs increase in participation

Factor	Item	Reference
Participation	Industry	Wit & Meyer 2004; Deane et al. 1991,
	Product group	Deane et al. 1991, Williams et al. 1995, Robinson & Satterfield 1998, UNCTAD 2010
	Geographic	Deane et al. 1991, Sturgeon 2000, Wit & Meyer 2004
	Value chain process	Gereffi & Memedovic 2003, Humphrey 2003

Interaction Capabilities

Participating in GVCs require the good interaction between small companies and big companies. Some SMEs have made successful integration with MNCs and some still have

problems to connect. In today's world market, having tangible resources solely will not guarantee the survival of SMEs in integrating with MNCs. Instead, firms need to develop their own capabilities.

An increasing body of literature has discussed capability and how it helps organisations to gain a competitive advantage. Capabilities can be considered as 'core' when they are able to make a company distinctive strategically (Leonard-Barton 1992). Leonard-Barton (1992, p. 113) defines core capability as, "the knowledge set that distinguishes and provides a competitive advantage".

This is aligned with studies in Japan that revealed the importance of knowledge creation by an organisation in order to survive in uncertain economic situation (Nonaka 2007). Organisational knowledge creation is a key factor that has varied Japanese companies from Westerners. Here, organisation knowledge creation can be described as an organisation's capability to create, disseminate new knowledge and apply it to products, services and systems (Nonaka & Takeuchi 1995). Besides, dynamic capabilities are also required to gain competitive advantage. Firms need (...) "to able to sense and to seize new opportunities, and to reconfigure and protect knowledge assets, competencies, and complementary assets and technologies to achieve sustainable competitive advantage" (Teece 1998, p. 72).

Adopted from previous conceptual frameworks, four constructs of interaction capabilities are identified as in Table 1-2 (Leonard-Barton 1992; Johnsen & Ford 2006; Ngugi et al. 2010). These capabilities include human, technology, managerial systems and cultural. The first interaction capability is identified as human. It refers to knowledge that embodies in individual's skills, expertise and experience which are not easily imitated and deployed (Teece 1998). The development of knowledge needs to come from both parties; small suppliers and large customers (Johnsen & Ford 2006) and it can be viewed in three levels from individual, group and organisation (Sabherwal & Becerra-Fernandez 2003). The knowledge include firm-specific techniques and scientific understanding (Leonard-Barton 1992). It is believed that the knowledge that embodies in human can be a source of competitive advantage (Nonaka 2007). This leads to the first hypotheses:

H1. A positive association exists between human interaction capability and SMEs' participation.

The second interaction capability is technology. It involves integration of technical systems among SMEs and their larger customers. The integration is important to allow technical problems to be identified and fixed at early stage. Study has shown that the integration level of SMEs is influenced by the demand of the larger customers. Nevertheless, SMEs with high customised technology will have difficulty to work with other relationship (Johnsen & Ford 2006). This capability comprises compilations of knowledge that derive from multiple sources of individuals (Leonard-Barton 1992). It has been proven that technological interaction capability could create competitive advantage to the firms as in the case of ENGTEK (UNCTAD, 2010). Thus, this has led to second hypotheses:

H2. A positive association exists between technological interaction capability and SMEs' participation.

The third capability is called managerial systems capability. This capability combines unusual skills and behaviours that are not observed in competitors (Leonard-Barton 1992). It is related to development of structures, strategies and relationships of suppliers and customers that can be created through formal and informal knowledge such as sabbaticals, apprenticeships, partnerships and collaboration (Leonard-Barton 1992; Johnsen & Ford 2006). These approaches can be two-way collaboration or one-way

collaboration. However, most of the cases tend to be one-way collaboration where customers have inductions or extended visits with suppliers (Johnsen & Ford 2006). Developing managerial systems interaction capability is critical for SMEs as it may influence their relationship with larger customers. Strong managerial systems capability could allow SMEs to have strong influence over their counterparts. Therefore, it leads to third hypotheses:

H3: A positive association exists between managerial systems interaction capability and SMEs' participation.

Finally, the fourth capability is termed as cultural interaction capability. This capability concerns on the company's value that related to the content and knowledge creation. Usually, it has been imposed by leaders in an organisation and instil as management practices (Leonard-Barton 1992). It relates to firm's ability to manage cross-cultural relationships and empowerment of employees. The development of this capability by SMEs might be influenced by larger customers' cultures and values. The ability of firm to develop this capability has enabled SMEs to integrate with larger customers and maintain the strong relationship (Johnsen & Ford 2006; Leonard-Barton 1992). Thus, this leads to fourth hypotheses:

H4: A positive association exists between cultural interaction capability and SMEs' participation.

Table 1-2: Interaction Capabilities

Factor	Item	Reference
IC	Human	Teece 1998, Johnsen & Ford 2006, Leonard-Barton 1992, Nonaka 2007
	Technological	Johnsen & Ford 2006, Leonard-Barton 1992, UNCTAD 2010
	Managerial systems	Leonard-Barton 1992, Johnsen & Ford 2006, , Sabherwal & Becerra-Fernandez 2003
	Cultural	Leonard-Barton 1992, Johnsen & Ford 2006

Performance Outcomes

A growing body of literature has discussed the topic of performance measurement system (PMS). Various authors have come out with different measurements to ensure a strategic and balanced system. The performance measurement reflects the common goals of a business that include profitability, market share, customer retention and satisfaction (Kaplan & Norton 1996). However, in this study SMEs' performance will be measured on return on investment (ROI), return on sales (ROS), market share and growth in these three measures as shown in

Table 1-3 (Droge et al. 1994). Therefore, the increase of SMEs' participation in HVM GVCs can lead to fifth hypotheses:

H5: A positive association exists between SMEs' participation and performance outcomes.

Table 1-3: Performance Outcomes

Factor	Item	Reference
Performance	ROI	Droge et al. 1994
	ROI Growth	Droge et al. 1994
	Market Share	Droge et al. 1994
	Market Share Growth	Droge et al. 1994
	ROS	Droge et al. 1994
	ROS Growth	Droge et al. 1994

Figure 1-1 represents the conceptual framework of this study.

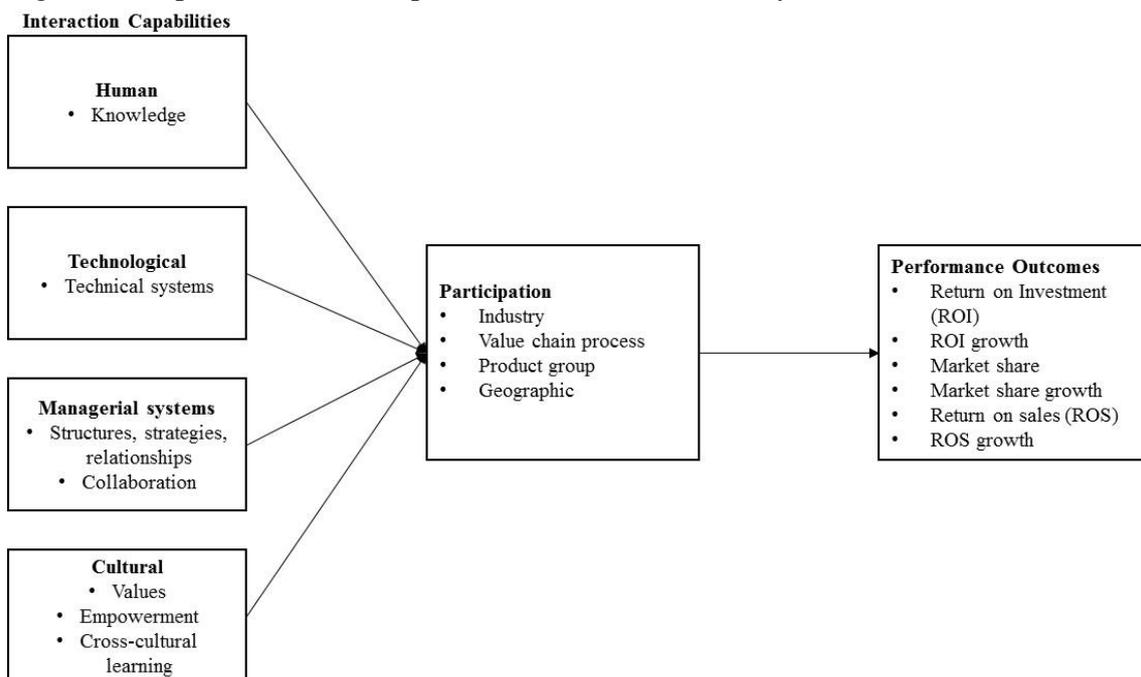


Figure 1-1 – A conceptual framework of SMEs' participation in HVM GVCs

Contribution

This study provides several contributions to both theory and practice. First, the study extends on the previous conceptual framework to SMEs' participation. The framework was first developed to assess the interaction of core capabilities with new product and process development projects (Leonard-Barton, 1992). Then, it was extended to explore the development of interaction capabilities between smaller suppliers and larger customers (Johnsen & Ford, 2006). Further, the relational capabilities linked to two themes of innovation and value co-creation (Ngugi et al., 2010). In this study, the research relates the interaction capabilities to participation of SMEs in global markets.

Secondly, the study diverges the focus from developing economies' SMEs in GVCs to SMEs from developed economies. This is because much research about GVCs has concentrated at enhancing and integrating SMEs' from developing countries in GVCs.

Lastly, it increases the awareness among SMEs on the importance of having different set of capabilities which will make them grow in industry, value chain process, product group and geographic.

Conclusion and Future Research

This study discussed the association of interaction capabilities and SMEs' participation in the context of HVM GVCs. Began with the literature on HVM and GVC, the study has developed a proposed conceptual framework. The conceptual framework argues that SMEs who acquire human, technological, managerial systems and cultural interaction capabilities able to increase their participation in HVM GVC. Their participation could span in terms of industry, product group, geographical and value chain activities.

To test the proposed relationship, two stages of data collection will be conducted in the future. The first stage will consist survey with the aim of assessing which type of interaction capabilities can be developed by SMEs to increase their participation in HVM GVCs and in the second stage, multiple case studies will be covered. The survey process will be developed in a series of steps (Forza, 2009). The purpose of this process is to ensure the quality of the research process. The first step covers the sample. In this study, SMEs in a developed country, UK will be investigated. The primary unit of the analysis is the individual SME and the population frame will be drawn from the UK Standard Industrial Code (SIC) database. The population is then sorted by size, geography and industry sector that will represent the sample size of UK manufacturing SMEs. Since this survey research employs questionnaire to collect data, the second step will involve determination of relevant measures of each item from the literature and will be included in the survey instrument. Once the questionnaire is finalised, pilot testing will be conducted to examine the measurement properties of the survey questionnaires.

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