Chapter 3

SMEs and Regional Production Networks - framework

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CHAPTER 3

SMEs and Production Networks – framework

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

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

1. Introduction

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

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

2. Framework

2.1. Context, Approaches and Capabilities

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

[1] As defined in this study, high quality means participation in tier 1 and 2 type production networking while low quality involves participation in tier 3 and tier 4 type production networking.

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

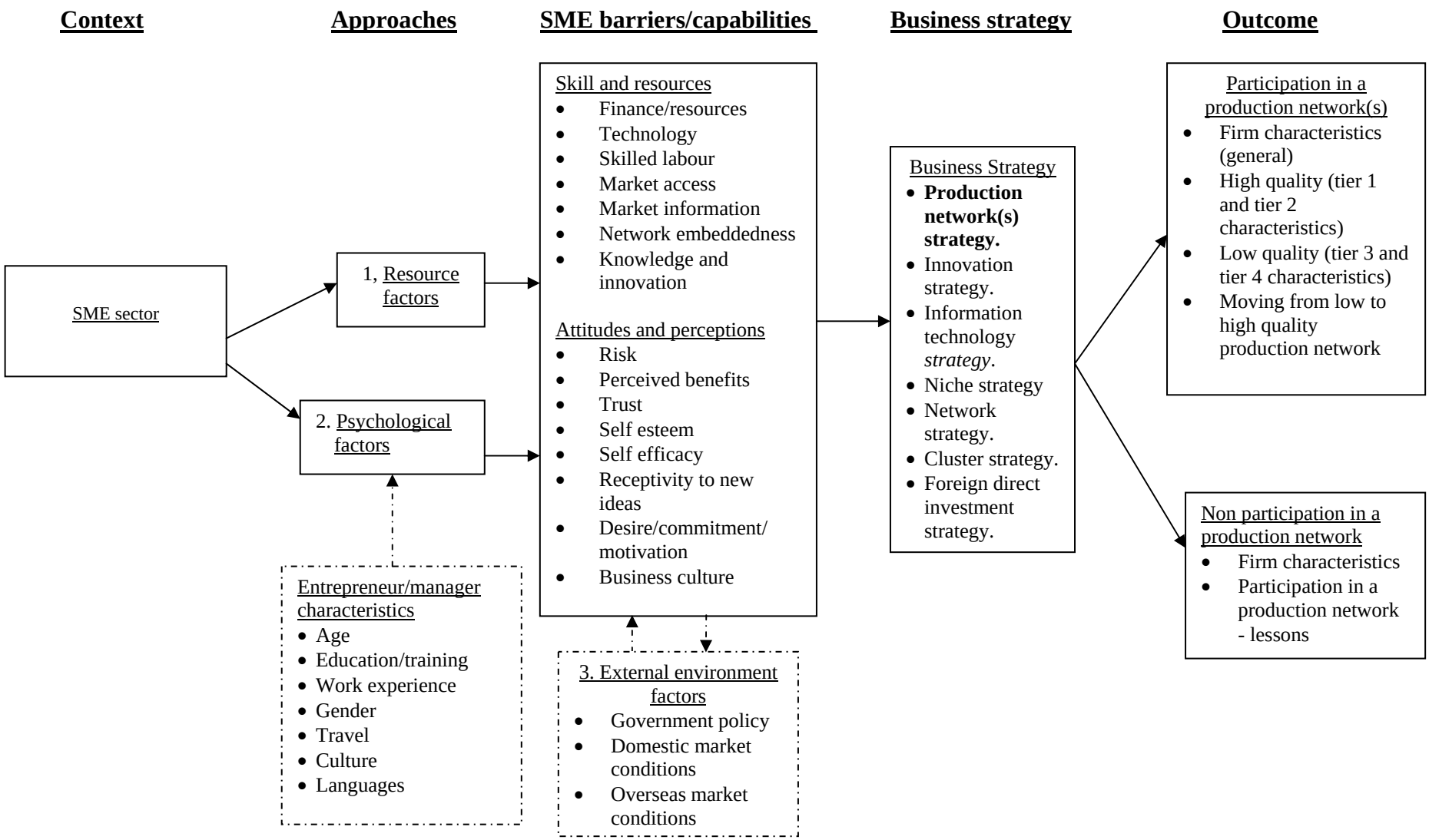
These factors can be usefully classified into the two broad headings of internal and external factors. **Internal factors** this can be further usefully broken down into two sub factors. The first of are directly relate directly to the small size and limited resources of SME. These **resource factors**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

Internal factors

(1) Resource factors

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

Figure 1 SMEs and production networks – framework outline



1. Access to Markets.

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

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

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

2. Access to Technology.

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

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

3. Access to human resources.

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

4. Access to financing.

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

5. Access to information.

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

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

6. Network embeddedness

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

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

7. Knowledge and Innovation.

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

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

(2) Psychological factors

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

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

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

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

(3) External environment factors

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

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

2.2. Business strategy

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

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

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

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

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

2.3. Outcomes – quality and depth of network production participation

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

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

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

3. Identification of Key Issues from the Framework

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

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

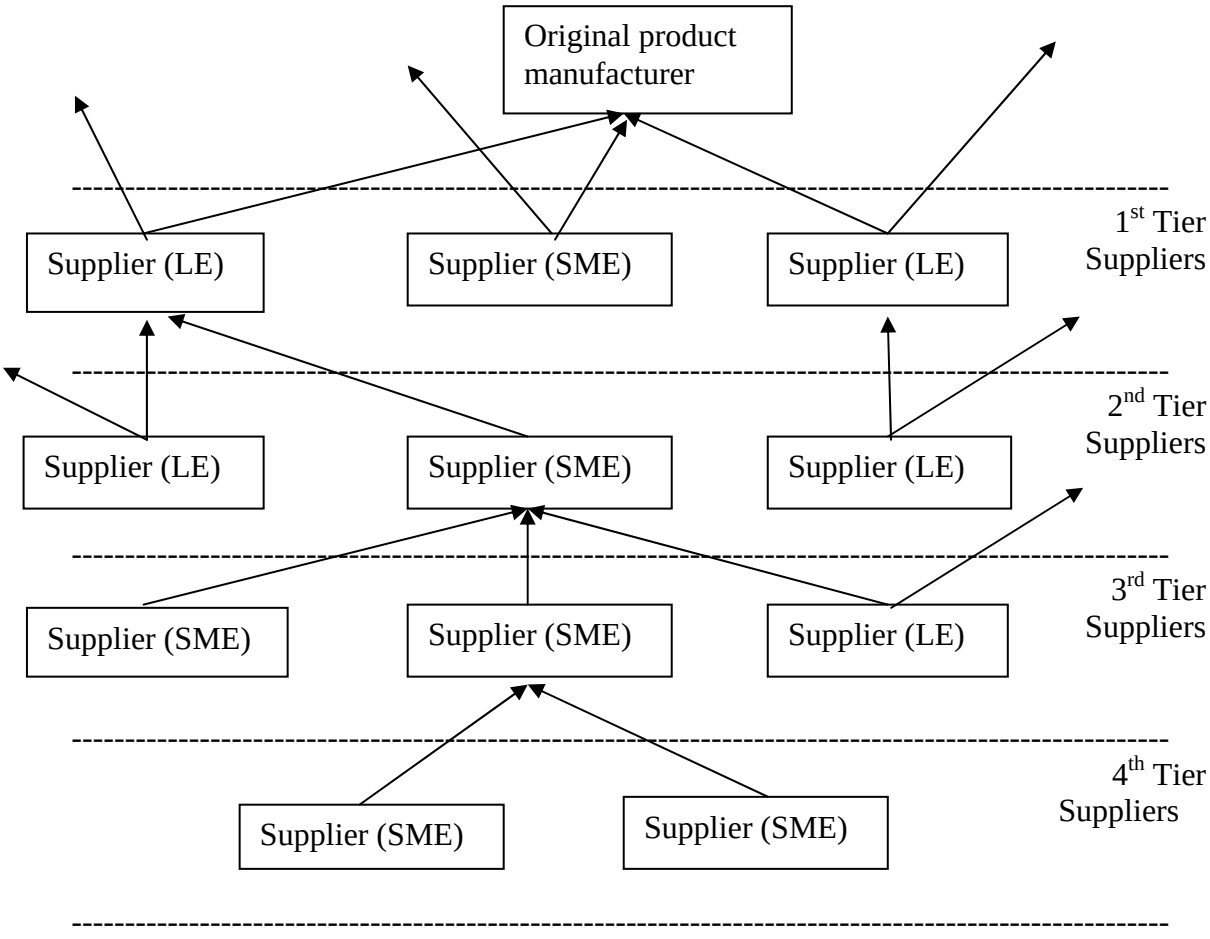
consisting of SMEs currently participating in a network and SMEs that are not. The major issues to be analysed are as follows:

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

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

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

Figure 2. Global and Regional Production Networks and SMEs



LE – Large enterprise
SME – small or medium sized enterprise

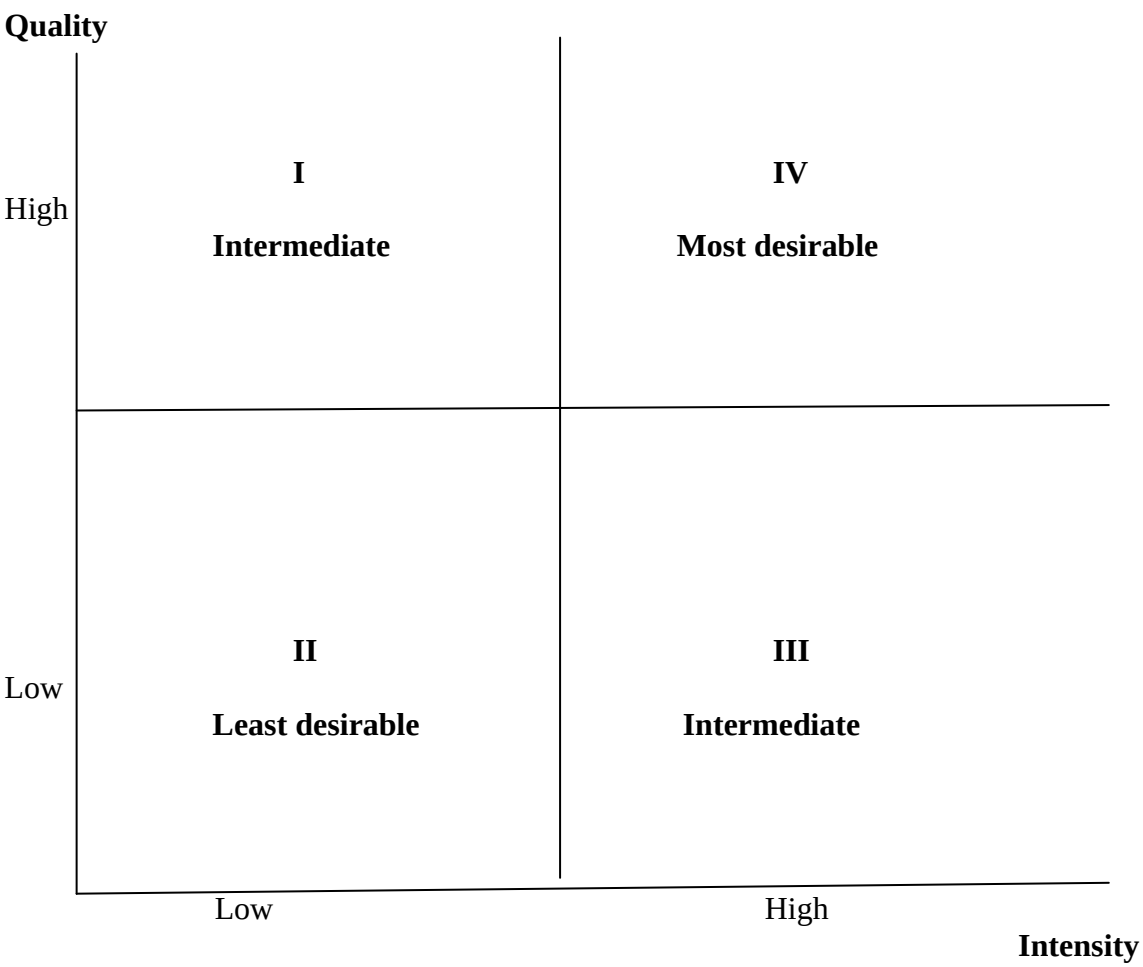
Source: Abonyi, (2005).

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

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

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

Figure 3. Quality-Intensity Nexus in Production Networks



Notes:

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

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

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

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

Source: Authors.

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

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

While Figure 3 provides a useful means by which to categorise our cohort of SMEs that are used in the survey questionnaire conducted in this survey, it also provides a useful means by which we can address the issue of identifying strategies, at the individual firm or aggregate (government policy) levels, aimed at moving firms located near the origin in Figure 3 (in the last desirable Quadrant 1) further from the origin (to the most desirable Quadrant IV). By identifying the statistically significant characteristics of enterprises in each of these quadrants, particularly those in Quadrant IV which we can regard as being the benchmark case, we can then compare these with firms in Quadrant IV. This process can also assist in identifying differences in the capacities and barriers facing enterprises in each of the four quadrants, and provide a focus for firm and government policies. One issue that we need to consider is that while the longer term objective is to move firms into Quadrant IV, this may not be feasible in the short or medium runs. Hence, for example, firms in Quadrant II may need to consider moving to Quadrant I in the short to medium run, attaining the characteristics and capacities of firms in this quadrant, before tackling the characteristics and capacities attained by firms in Quadrant IV. On the other hand firms in Quadrant II may move to Quadrant III and then IV, requiring a different short to medium term strategy. Hence Figure 3 has the potential to provide an interesting framework in which to consider short and medium term goals for firms in terms of their characteristics and capacities and constraints, if longer term objectives are to be obtained.

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

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

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

4. Summary and Conclusions

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

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

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

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