The Role of Foreign Direct Investment in Inter-firm Linkages in China’s Petrochemical Industry

by

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The process of this PhD research program is a long and complicated voyage. It is also a learning adventure. I have had the good fortune of being the recipient of advice, knowledge and effort from so many. Completing this dissertation would not have been possible without the assistance of a considerable group of people.

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ABSTRACT

This research explores foreign direct investment (FDI) impact in the host country in terms of the inter-firm linkages between Multinational enterprises (MNE) subsidiaries and local firms, with a focus in China’s petrochemical industry. Inter-firm linkages between MNEs and local firms in the host country are important channel through which the latter may benefit from the positive externalities generated by the former.

Conceptualisation emphasizes the variety of linkage scope covering backward, forward and horizontal linkages, as well as multi-dimensions of linkage characteristics including quantity of local linkages (MNE subsidiaries’ local sourcing/sale), and quality of local linkages (local collaboration and resource transfer to local firms). Multiple streams of literature are combined to develop the framework for the analysis of MNEs’ inter-firm linkages. This research analyzes antecedents to MNEs’ inter-firm linkages; and the impact of MNE subsidiaries’ local orientation on the quality outcomes. A series of influential factors is constructed, highlighting the different conditions where inter-firms linkages form and development potential is generated.

The analyses are conducted by employing a case study for in-depth interview data of 17 firms and statistical tests for mail survey data covering 63 firms. Factors playing significant role in local orientation, local collaboration and resource transfer include MNE subsidiary’s age, country of origin and ownership mode, and regional differences in industry agglomeration, technological capability, and government assistances in China. The results also induce the role of MNEs’ local orientation as a moderate factor conducive to their local collaboration and resource transfer. Findings in this research lead to a better understanding of when and how FDI contribute to development potential for the local economy and firms, which thereby concludes with implications for MNEs, local firms and host country government.
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<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>CJV</td>
<td>Cooperative joint venture</td>
</tr>
<tr>
<td>CoO</td>
<td>Country of origin</td>
</tr>
<tr>
<td>EJV</td>
<td>Equity joint venture</td>
</tr>
<tr>
<td>FDI</td>
<td>Foreign direct investment</td>
</tr>
<tr>
<td>FIP</td>
<td>Foreign-invested project</td>
</tr>
<tr>
<td>FSA</td>
<td>Firm-specific advantage</td>
</tr>
<tr>
<td>GVC</td>
<td>Global value chain</td>
</tr>
<tr>
<td>IDP</td>
<td>Investment development path</td>
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<tr>
<td>IFL</td>
<td>Inter-firm linkage</td>
</tr>
<tr>
<td>JV</td>
<td>Joint venture</td>
</tr>
<tr>
<td>LDC</td>
<td>Less developed country</td>
</tr>
<tr>
<td>LIE</td>
<td>Late industrialized economies</td>
</tr>
<tr>
<td>LSA</td>
<td>Location-specific advantage</td>
</tr>
<tr>
<td>MNE</td>
<td>Multinational enterprise</td>
</tr>
<tr>
<td>POE</td>
<td>Province-owned enterprises</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
</tr>
<tr>
<td>RBV</td>
<td>Resource-based view of firm</td>
</tr>
<tr>
<td>SET</td>
<td>Social/relational exchange theory</td>
</tr>
<tr>
<td>SEZ</td>
<td>Special economic zone</td>
</tr>
<tr>
<td>SNA</td>
<td>Strategic network approach</td>
</tr>
<tr>
<td>SSF</td>
<td>Subsidiary-specific factor</td>
</tr>
<tr>
<td>SOE</td>
<td>State-owned enterprises</td>
</tr>
<tr>
<td>TCE</td>
<td>Transaction cost economics</td>
</tr>
<tr>
<td>WOS</td>
<td>Wholly-owned subsidiary</td>
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<tr>
<td>WTO</td>
<td>World Trade Organization</td>
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DECLARATION

The thesis has been prepared in accordance with the regulation to PhD degree at University of Surrey. This work is to the best of my knowledge and belief, original, except as acknowledged in the text. It has not been submitted, in any form for a degree at any other university.

Yan Fu
Jan, 2011
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CHAPTER ONE   INTRODUCTION

1.1 Background of This Research

One of the main reasons why a country or region seeks to attract inward foreign direct investment (FDI) is multinational enterprises (MNEs) can act as agents for business environment change, linkage creation, trade effects and the transfer of technology across national boundaries, and in turn exert their impact on the economic development of host countries and regions. These impacts can be found in many aspects of the host economy, such as capital, technology, trade, industrial structure, employment (Dicken, 1992), comparative advantage, economies of scale and scope (Young et. al., 1994), infrastructure improvement (Kueh, 1992), economic, institutional, and legal reforms emphasized by a few researchers (Zhan, 1993, Lardy, 1994, Porter, 1995). One of the most important ways to tap these benefits is through production linkages between foreign affiliates and local firms, backward, forward or horizontal (UNCTAD, 2001). FDI would therefore provide benefits to the developing countries as it helps to transfer these resources that are important to the production process, technology, and the necessary capital and foreign exchange (Kobrin, 1991) and these transfers may diffuse to local firms (Blomström and Kokko, 1998).

It is commonplace to mistake the size of FDI to indicate its regional economic impact. In the aspect of the increasing presence of foreign firms in developing countries, and debate of relative impact on the host countries’ development, MNE’s external networks in host country are considered as determinant of the benefits that the host country can derive from FDI. The more FDI or foreign firms in host countries, the greater the benefits that will be generated in the local economy. However, the size of FDI is not always equal with its real impact on regional economic development. A few studies, particularly those undertaken in developing or transitional economies contexts, suggest that inward FDI does not necessarily result in positive spillover (e.g. Aitken and Harrison, 1999; Bosco, 2001; Günther, 2005). These finding has been attributed to the
various number or intensity of linkages formed by different types of foreign affiliates in different host economy contexts.

The growth performance of the Chinese economy has been the subject of considerable analysis recently. They argue that the inflow of FDI into the economy and, link to this, the rising significance of MNE has been a major factor in explaining this growth performance (Krugman, 1997; Leddin and Walsh, 1997; Sachs, 1997). FDI is one of the most dramatic features of China's move from a planned economy toward a market economy. FDI has become well-established in China's economy, and the activities of MNEs came to assume increasing importance in capital formation, labour training, technology transfer, international trade, and in accelerating the transition of China from a planned economy to a market economy. The FDI in China were mostly concentrated on labour-intensive industries in 1980s, turned to capital-intensive industries in early 1990s, and then further tech-intensive industries in recent years, e.g. electronic, automobile and petrochemical industry. China has attracted more and more MNEs to invest in these tech-intensive industries (UNCTAD, 2001). Currently, nearly 400 enterprises out of the Top 500 corporations have invested in more than 2,000 projects in China. Since the passing in late 1979 of the equity joint venture Law which granted legal status to FDI in Chinese territory, China has gradually liberalized its FDI regime, and an institutional framework has been developed to regulate and facilitate such investments. The liberalisation of the FDI regime and the improved investment environment has greatly increased the confidence of foreign investors in China.

MNEs' expansion and linkages in host economies have therefore become a particularly important issue, especially in emerging economies. Through local linkages, MNEs potentially generate considerable benefits for host economies, both from value-chain multipliers and technology transfers and spillovers. Studies have shown that the linkage potential of MNEs is higher than that of local firms in some developing countries (Potter et. al., 2003; Alfaro and Rodríguez-Clare, 2004; Jensen, 2004). Nevertheless, given their importance, this aspect is currently under-studied and there is a considerable need to understand fully the linkage behaviour of foreign firms in host economies, particularly
the debate is dominated by economists while international business scholars have largely been sitting on the sidelines (Meyer, 2003). Empirical literature has recognized the spillover effect of local linkages, but limited consideration is given to the development mechanisms, that are inter-firm linkages and resource transfer via these linkages. The shortcomings make it difficult to interpret the results obtained in the empirical studies and it is hard to conclude about how government policy should encourage the creation of linkages. In view of China’s entry into the WTO, which prohibits the use of internal regulations to discriminate in favour of domestic production, the question can be raised whether there is scope for increasing the level of local linkage through policy interventions.

It believes that foreign-local inter-firm linkages not only create potential benefits for MNEs subsidiaries to, but also are crucial for developing host countries. This research is interested in the latter aspect. The theoretical and empirical background on the impact of FDI inflow on host economies pushes this research. MNEs exercise their impact on the economic development of host countries and regions through FDI can be extended through industrial linkages, however, foreign investors affect their host economies, and local firms in particular, through a wide range of mechanisms. Thus the relationship between foreign investors and local businesses is complex. In international business discipline, the number of local links and the number of global links for each firm exist across firms, and MNEs often source their inputs through their own international production networks, which, in addition, could also have potentially negative linkage effects. Perhaps this differentiation reflects the different pattern of marginal costs and benefits associated with networking across firm types and across locations. These differentiations could be concludes by analysing the factors which contribute positively or negatively, and significantly not apparently to influence the characteristics of local linkages. Due to these reasons, it is important to investigate quantity and qualitative dimensions of such linkages that determine the development potential for the host country.
1.2 Research Objectives

The general aim of this research is to investigate the determinants of MNEs' inter-firm linkages creation in the host country. The analysis focuses on inter-firm linkages/relationships (IFLs) between MNE subsidiaries and local firms in Chinese petrochemical industry sector, or equivalent partners worldwide. 'Inter-firm linkage' that appears in this research is bounded in the international business field, and particular refers to the MNEs involved inter-firm linkages.

This research firstly investigates the factors influencing on the multiple dimensions of IFLs: MNE subsidiary's local orientation of sourcing and sale, strategic outcomes in local linkages in terms of local collaboration and resource transfer to local firms. Although it appears as extremely important to understand the inter-firm linkages between MNEs and local firms as a development mechanism of FDI in the host country, there is no general agreement on the factors that shape these linkages. The first focus of this research is therefore about the causes of such inter-firm linkages in Chinese petrochemical industry by advocating a series of firm-specific and location-specific factors. On one hand, MNEs and subsidiaries systematically differ in their inherent propensities to establish inter-firm linkages with some firms tending to linkages more than others. On the other hand, the environmental differences across regions in China may influence the opportunities for such linkages. There are three specific objectives:

1. To analyze the impact of MNEs with different countries of origin on IFLs of their Chinese operations.
2. To analyze the influence of foreign subsidiaries' firm-specific factors on their IFLs.
3. To analyze the impact of the regional differences in China on IFLs of the foreign subsidiaries.

The second research aim is to examine the impact of strategic/local orientation on the strategic outcomes (local collaboration and resource transfer to local firms). International business studies in inter-firm linkages signal the importance of
understanding the local linkage effect in host economies, one of which is potential knowledge diffusion from foreign affiliates to local firms. The process of firms' externalisation in host country is complex than a simple choice between 'make' or 'buy', but also foreign subsidiaries' information sharing and transmits to local firms. Some knowledge transfer occurs involuntarily through human capital mobility and through the imitation of the technological and managerial practices of global buyers. Important knowledge assets are also transferred voluntarily by MNEs on a reciprocity basis. MNEs' presence in host country may create close relationships with local suppliers and customers, but not all local linkages equally embody learning-intensive collaboration, or are conducive to the knowledge diffusion. Hence, it is important to investigate the association between the quantity of local linkages and the creation of quality linkages that may in turn be beneficial for the development of local industry. In all, the second objective of analysis is to answer the question: whether and to what extent MNE subsidiary source and sale to local firms lead to resource transfer and collaboration in the Chinese petrochemical industry. Specifically, there are two objectives:

4. To analyze the impact of strategic orientation of MNE subsidiaries on their local collaboration in China.

5. To analyze the impact of strategic orientation of MNE subsidiaries on their resource transfer to local firms.

In all, this research aims to make a contribution to the knowledge in a number of areas, based on an element of originality. It attempts to make contributions to literature and practice in the three areas: to literature, in terms of bridging and testing theories of international business and network linkages, as well as revisiting and summarizing empirical studies; to data, in terms of an industry-focus since there are few local linkages studies which are informed by in-depth data from key players in strata of a national industry; and to practice, in terms of managing business relationships and to social and economic development, in terms of understanding the wider ramifications of the activities of business organisations. This research eventually will provide a deep account on the quantity and quality of MNEs' impact on capability development in host
countries, and therefore provides precious information for governments eager to establish the most appropriate policies to encourage local linkages and subsequent resource transfer. And it becomes meaningful to discuss problems of host government policy in general and, more specifically, how policy interventions may influence local linkages and potential technology transfer.

1.3 Research Context

In order to add to theory about the use of networks and relationships in strategy, it is important to understand the forces within a real business context or situation. From the perspective of research methodology, context and constraints could also influence the methodological choice. According to Van Maanen (1983) qualitative method places great importance on contextual understandings based on direct, firsthand and more or less intimate knowledge of a research setting. IB research concerned with international networks and internationalization process are especially prone to use critical realist interpretations (Easton, 1995).

Research on linkages and spillovers has revealed that in developing economies or regions, MNEs presently shape the distribution of production globally and set the pace for technological change in these markets. Their influence on the opportunities for learning and innovations and thus growth and development in developing countries is unparalleled. Therefore, it is proposed that in such developing economies, linkages with foreign firms become more important. In order to better understand the role of FDI in such economies this study considers the China case. China is a large, developing, but highly reliant on a high level of FDI for technology and innovation. China government and companies continue to seek opportunities for foreign invested projects without understanding the impact the investment on local industry. Upgrading of knowledge based assets is therefore a particularly important issue as it seeks to develop Chinese domestic firms.
It is also important to define the industry level context for network and linkages research. Industry is part of the social and historical network context in which economic action is embedded. Transaction and physical flows and structures in exchange are complemented by social systems within industries, which evolve reflexively: the industry shapes perceptions and behaviour among players but is also shaped by players in the industry (Biggiero, 2001; Moore, 1996). Industry is various in terms of resources, human and physical, learning, institutional environment, cultural conditions technological stage (Porter, 1998; Saxenian, 1994). Firms around the world tend to favour external relationships instead of intra-firm exchanges, especially in tech- and capital-intensive industries such as petrochemical and chemical sectors. Empirically, how and why cooperation arises in particular industries rather than others is an area of increasing research interest (Browning et. al., 1995; Ring and Van De Ven, 1992; Trice and Beyer, 1993). Hence, this research targets particularly on manufacturing companies in downstream petrochemical sector where linkages are expected to be more significant, and product type and technology intensity are obvious differ cross industries.

Based on the competitive systems, firms of different industry sector have very different ways in which their activities are structured and interact. The Chinese petrochemical industry is a useful setting for the research. The large scale of state-owned enterprise (SOE) might have a role in the performance of domestic and foreign firms, and government encouraged the formation of joint ventures to strengthen the position of local capital and maximize gains from technology transfer. The petrochemical industry which is public owned is a good example here. The petrochemical industry is significant from other industries in a few ways. First, it is a technology-intensive industry. Second, its initial capital outlay in equipment and working capital is enormous. Third, the petrochemical industry is one of the most competitive industries in the world. Competition arises from the presence of both domestic and foreign companies. Fourth, the industry itself provides many inputs for many related industries. With these unique characteristics, the industry is significant and deserves a specific and concise study. Chapter three will give a background analysis for the industry context and country context. The industry faces significant technical, cultural, and managerial barriers
between source and recipient organizations, yet there is growing evidence of MNEs from developed countries transferring R&D capabilities to their subsidiaries and local partners. Thus the present research rested on the notion that specific industry level studies could easily cause behaviour diversity, which is not selected as one of the factors to be investigated. Furthermore, industries with strong linkages in both forward and backward directions (such as petroleum products and chemicals) can be distinguished from those with predominately forward linkages (such as metal mining and agriculture) and those with predominately backward linkages (such as grain mill products and leather products).

Most investigations of FDI have been undertaken across countries. But fewer studies have considered location issue within countries, which is another context focus of this paper. Countries possess distinctive physical, economic, and political attributes. Although foreign investors may now be found in almost every corner of China, they are highly concentrated in particular provinces or regions. There are also better economic endowments and environment given in some regions over the others. Just as between-country differences may be important determinants of how MNEs operate and perform, there is reason to believe that regional distinctions may also influence the linkage pattern of MNE’s subsidiary in the case of China. Previous studies of foreign trade and investment at the national and regional scales have shown that, inter-city location in China of FDI firms is very complicated and thus cannot be explained by classical industrial location theory. Such initiatives permit the study of inter-firm relationship issues at a sub-national level in China.

1.4 Structure of This Dissertation

Figure 1.1 below gives an illustration of the research process which will arranged correspondently in the structure of this dissertation. Each chapter is linked to the other, and brings essential information for the study of MNE, inter-firm linkages and resource transfer of linkage related.
Chapter 2 presents the relevant theories which informs the research, with background and focal theory discussed, setting out definitions used in this research have been considered, in order to establish a theoretical framework to be applied as the basis for the research. This chapter starts with the conceptual perspectives of local linkages, including the definition of local linkages in this research to delimitate the research strand and, the overall picture of MNEs' impact on host economies, particularly through local linkages which lead to the characteristic composition of local linkages. A review of the extant literature reveals several limitations and provides the insight to the significance of this research. Out of this process, series of propositions are refined regarding to local lineage creation and related transfer. As the result of preliminary data collection, Chapter Four looks at China as the host for FDI, the historical development of petrochemical
industry and government regulation and policies towards foreign firms and their operations. This chapter helps to narrow down the research propositions and provide necessary information in order to define variables, e.g. location, entry mode, country of origin. The beginning of Chapter Four explains the application of triangulation method in this research. Design of data collection for both qualitative and quantitative methods and variable measurements developed for survey are also presented. Chapter 5 provides description and analysis of the data gathered during the field research. The analysis of case study is done in two steps. Firstly, each interview was analysed case by case. Secondly, the interviewed cases will be analysed ‘across case’, a process which enabled conclusions to be drawn on comparative way. The quantitative approach employs linear and ordinal logistic regress models to find out the list of factors affecting two dependent variables: strategic orientation, local collaboration and resource transfer. Further tests also reveal the relationships between linkage creation and related transfer degree. Finally, Chapter 6 gives a summary and discussion of the major research findings, policy implications drawn from this research, and suggestions for further study.
CHAPTER TWO  LITERATURE REVIEW

The objectives of this chapter are: discussing the concept and characteristics of inter-firm linkages; reviewing theories and previous research relevant to the research questions where the theoretical underpinning is derived from; and presents a theoretical integration that not only considers issues related to MNEs and local linkages and but also the existing studies. This research is based on multiple theoretical concepts and theories which bring in difficulties since it does not test one approach, but a construct of factors selected from the analysis of theories linked to the analysis of the MNE and the analysis of international business activities. A fundamental dimension distinguishing among these theoretical and empirical literature is whether they are about the outcomes or determinants of inter-firm linkages.

2.1 Conceptual Discussion on Linkages

The formal concepts of inter-firm linkages and local linkages are ambiguous in current literature. There often different terms for the same meaning, or alternatively different meanings for the same term. This section is therefore, to define this concept before embarking on following research.

2.1.1 MNEs and inter-firm networks

Different to the traditional definition of MNE in the respect of geographic dimension of business operation, a MNE is viewed as an inter-organizational/firm network(s) that is embedded an international web of external networks or hierarchies consisting of their subunits or subsidiaries, and other organizations such as customers, suppliers and regulators (Ghoshal and Bartlett, 1990; Ghoshal and Nohria, 1997; Forsgren et. al., 2000; Harzing, 1999; Casson, 2000; Rugman and D'Cruz, 2000). FDI is a long-term endeavour in which relationships established within a foreign country provide a foundation for repeated transactions between the headquarters and the subsidiaries,
between the subsidiaries and local firms, and between affiliates in different countries (Dyer and Chu, 2000). These definitions of MNE and FDI derived the concept of a business network which refers to a set of two or more connected business relationships (Anderson et. al., 1994). External networks are formed between a number of independent firms, whereas internal networks are formed between organizational units separated by functions, businesses, or geographic locations (Charan, 1993). The MNE group is moreover modelled as a network of loosely coupled entities, rather than a singular hierarchy, which gives the subsidiary the necessary freedom to develop and shift its own unique resource profile, including human and technological resources, within the host country (Dyer and Dingh, 1998; Rugman and D’Cruz, 2000). According to these literature, the MNE’ network is entity comprising external (non-corporate or inter-firm) and internal (corporate or intra-MNE) relationships between various business actors.

The business networks literature encompasses ideas of intentionality and strategic intent in creating and using networks or relationships. MNE is considered leading role in the networks in host countries, because they possess proprietary assets that it tries to exploit internally by extending its own organisation and control across national boundaries (Buckley and Casson, 1976). As the lead firm, MNE is one around which organizational sets (Bartlett and Ghoshal, 1998), strategic clusters (Rugman and D’Cruz, 2000) or a system of activities (Casson, 2000) can be defined. They not only directly control and coordinate their own complex internal networks within various entities of the MNE at an internal or a global scale but also indirectly control many of the externalized networks in which it is embedded (Dicken, 2003). In another word, external networks with activities created by the subsidiary in host countries have been partly internalised by the parent firm. These definitions and notions are important for this research since they stress the role of MNE and its subsidiary in terms of local relationships or linkages creation. Buckley and Casson (1998) consider MNEs as flexible entities and they will adopt flexible strategies to cope with changing circumstances of international business, which means MNEs adapt strategies corresponding to different national market environment to remain competitive and develop efficiency.
Figure 2.1 displays a MNE subsidiary’s networks of IFLs, which consist of local linkages, intra-MNE linkages and international linkages. Intra-MNE linkage is not part of local linkages nevertheless it is critically relevant to the subsidiary’s activities and subsequent transfer to independent local firms. Considering the spatial dimension, when a MNE proceeds to FDI and establishes a subsidiary in a host country, ‘local linkages’ or local IFLs are established between the subsidiary and its locally-owned suppliers, customers and collaborators. International linkages include the relationships between the foreign subsidiary and other foreign-owned firms that may be located in any of the ‘triad’—host, home and other overseas markets.

The growing inflow of FDI into the emerging economies has raised the discussion about the role of foreign subsidiaries in the global production and technological networks of a MNE. FDI is the process through which MNEs transfer resources and capabilities to subsidiaries in overseas countries where specific market opportunities and location-specific resource endowments exist (Buckley and Casson, 1976; Hennart, 1982;...
Dunning, 1977; Rugman, 1985). These firm- and location-specific advantages are exploited through appropriate subsidiary strategic orientations (Ghoshal, 1987; Roth, 1992). At the corporate level, strategic processes allow resources and capabilities to be either tightly integrated at headquarters or dispersed across the subsidiary network (Roth and Morrison, 1990; Roth et al., 1991). Some subsidiaries mainly transfer know-how, skills and technology from their parent in order to operate in the host country. Other subsidiaries develop technology, new products and organizational capabilities that contribute to the upgrading of their parent’s firm-specific advantages (Birkinshaw, 1997).

The concept of ‘linkage’ is mostly cited in existing literature as repetitive business transactions and collaborations between foreign affiliates and domestic organizations. However, the term ‘linkages’ used commonly in IB research refer to the relationships that go beyond arm’s length, one-off relations and involve longer-term relations or more intensive interaction between the parties (which have been acknowledged as the mechanisms or channels for spillover at micro or firm level (e.g. Giroud and Scott-Kennel, 2007; Meyer, 2003; UNCTAD, 2001). Local linkages forged by MNEs go beyond pecuniary exchange and bring technical, but also informational, financial, organisational and managerial externalities (Crone and Roper, 2001; UNCTAD, 2001; Ivarsson and Alvestam, 2005). Scholars have been bringing to attention the importance of relationship capital, which allows firms to access and deploy various kind of resources (Kale et al., 2000; Dunning, 2002). From this respect, IFLs are substantial channels for exchange and transferring these resources that supplement transactions and interactions. For the purpose of this research, ‘resource’ is used as a generic term to cover technology, knowledge and other types of resources. The most common form of resource transfer is technology transfer such as capital goods, managerial skills, knowhow and so on (e.g. Lall, 1993; Chen, 1994; Kumar, 1998). The resource transfer through FDI takes two stages. At the first stage, the intra-firm (parent-subsidiary) transfer of firm-specific assets and resources benefits the MNE’s subsidiaries in host countries. At the second stage, the inter-organization (foreign subsidiary-local organizations) transfer of resources has the potential to benefit local firms.
Following these thoughts, local linkages encompass two ‘tiers’ as illustrated in figure 2.2. In the longer-term, ‘local linkages’ involve relationship-based transactions, collaborative interactions between MNE subsidiaries and local firms (organizations), as well as the resource transfer activities between MNE subsidiaries and local firms. The share of local sourcing and sale represent the quantity of local linkages, while resource transfer and local collaboration are considered as the quality of local linkages (Giroud and Scott-Kennel, 2009).

For the purpose of this research, this research defines MNE subsidiaries as the focal firms in local relationships, and only interested in the resource transfer to the latter. ‘Local firms’ in this concept are those locally-owned firms including partially foreign-owned firms based in the host country. Wholly foreign-owned firms based in the host country are excluded from the boundary of ‘local firms’ because host country benefit directly from transfer of technology and spillover only if the local firms are national firms, and it is supposed that the host country is only interested by the technological upgrading of its own firms. Resource transfer and externalities may occur at development stage of IFLs, which are characterized with intensification of contacts, trust, adaption and mutual benefits. Being embedded in different local networks of host countries, there is interaction involving special feature of resource exchanges between these different units.
In terms of relationship direction, inter-firm linkages could vertical or collaborative, which firstly developed by Hirschman (1958) and Maillat (1998). Vertical relationships between MNE subsidiaries and local firms embody all value chain relationships created in the host country, which are backward to suppliers (upstream) or forward to customers (downstream). Backward (supplier) relationships include all upstream relationships with local one-off suppliers, key suppliers or subcontractors (UNCTAD, 2001), and involve the purchases of primary, secondary and tertiary supplies. Forward (customer) relationships are defined as all downstream relationships developed between foreign subsidiaries and customers, sales agents and distributors in a host economy, implying the marketing, sale and distribution of goods and services in the local economy.

Collaborative (horizontal) relationships involve interactions between firms or organizations engaged in competing activities and may either have a negative or a positive impact on local business activities. Comparing with value chain activities, formation of horizontal collaborations is more indicative of a foreign subsidiary’s local embeddedness. Some MNEs may foster ‘transactional’ linkages in which the MNEs more or less dictate the terms of the collaboration, while other MNEs may foster linkages with a high level of reciprocity and mutual exchange of resources and knowledge (Scott-Kennel and Endewick, 2005). Collaborative linkages occur when affiliates and local firms engage in alliances, technology sharing or development agreements, or management contracts (Madhok, 1996). Such collaborative relationships are long-term oriented, and usually hinge upon for instance the movement of expertise and engines between the collaborators, and offer enormous potential for upgrading of both affiliate and local partner, via a reciprocal exchange of firm-specific advantages and resources (Scott-Kennel, 2004).

The balance of external and internal relationships dimension is an important decision for MNE. The importance of the internal and external business network as a strategic resource has been demonstrated in the context of the MNEs having strategic significance for subsidiary’s behaviour in host country (Snow et. al., 1992). Forming external forms and relationships with local firms enable MNEs to exert their competitive advantages, source inputs locally, take advantage of local firm experience and knowledge of the
market, develop its assets in collaboration with other firms, and access unique resources created locally (Leenders and Gabbay, 1999). It has been demonstrated that external business network embeddedness has a positive impact on a subsidiary's expected sales growth, market share and profitability as well as on its importance for other MNE units' competence development (Andersson et. al., 2002). These relationships may also play an important role as sources of innovation, new business ideas and practices. MNEs no longer rely solely on advantages generated internally, from their own resources and capabilities, but also depend on those created via the interaction with other firms (e.g., Hagedoorn, 1993; Dunning, 1997; Castell, 1996). MNEs could become increasingly more decentralised through new forms of subcontracting, outsourcing, and other networked forms of organisation, with growing dependence upon complementary capabilities controlled by other firms for their competitive position (Dunning, 1997; Nohria and Ghoshal, 1997).

A further crucial question for MNEs is whether and how much linkages to create with the host economy, which means the orientation of IFLs toward different geographic markets. This question is important in an open economy framework where many inputs and outputs can be internationally traded. In such a context it seems important to establish whether firms create local linkages with the local economy or whether they import and exports most or all of their inputs and output respectively. MNEs make use of relational capital to create local relationships that further contribute to the stock of their capital and it is the investment in local relationships that builds the platform for foreign-based activities. Seen from the perspective of OECD based MNEs, linkages to developing countries' enterprises have traditionally been established to access unique location specific assets in developing countries that can strengthen the global positioning of the MNEs (OECD, 2002). These assets could be such as cheap but qualified labour, cluster properties of industrial sectors, future market potential, R&D capacity, local market knowledge, information about production conditions or contacts to the local business environment and authorities (Dunning, 2000).
Moreover, in order to ensure the private returns to their investment in new information, MNEs are reluctant to compromise firm-specific assets through exchanges with local competitors (Javorcik, 2006), and have an incentive to exploit their technologies within the boundaries of the corporation and internalize their use (Hood and Young, 1979). There are mutual benefits for both MNEs and local firms from the exchange of technology and skills. Linking up to global networks allows local firms to access the technological knowledge and extensive resources of MNEs. By linking downwards into local networks, MNEs often gain access to sources of unique, tacit knowledge and thereby enhance their innovative capacity (Lyons, 2000; Zanfei, 2000). This implies that MNEs are willing to supply hardware or applied knowledge, techniques and skills when aiming to ensure competitive subsidiary operations in the host market.

2.1.2 The characteristics of inter-firm linkages

The term ‘characteristics’ has been chosen in this research as the best representative of other designations found in the literature such as ‘feature’, ‘nature’, and so on. The characteristics of exchange occurring between network partners shape IFLs and define their essence and predicate their potential impact on host economy. Some MNEs may foster few linkages involving few types of activities, while others may have many types of activities spread on numerous local partners. Some MNEs may foster ‘shallow’ local linkages, meaning low levels of resource commitment (e.g. in terms of technical assistance, management advice, and other resources) while others may foster ‘deep’ local linkages, investing massively in upgrading their local linkage partners (Hansen and Schaumburg-Müller, 2006). Two types of exchange have been clearly differentiated in the literature: transactional and relational exchange (Dwyer et. al., 1987) which implies that nature of exchange relationships should consider both transaction and other relationship characteristics. Network and cross-border linkages literature have identified a few important characteristic indicators that are most relevant to the topic of local linkages and their impact on host country, such as time, complexity, multiple players, active participation, reciprocity, mutual adaptation and change, embeddedness and interdependence (for more complete list: Ballantyne, 1995; Gassenheimer et. al., 1998; Todeva, 2006; Giroud and Scott-Kenel, 2009).
One of the most intriguing and complex issue concerning FDI is its embeddedness in the host country (Pavlinek and Smith, 1998; Phelps, 2000; Dicken and Malmberg, 2001; Dicken, 2003). This can be approached at different spatial scales: national, regional, and local. The local embeddedness of MNEs refers to the manner in which MNEs and their competitors, customers, suppliers, regional business, and public organizations functionally connect in the network of relationships in which they operate (Harrison, 1992; Dicken et. al., 1994; Henderson et. al., 2002). The MNE subsidiary’s degree of external network embeddedness, in terms of closeness of specific relationships is a fruitful indicator of its level of resources and consequently to what extent the MNE can be characterized as a differentiated network. Therefore, local embeddedness concerns primarily with the nature and quality of connections between inward investors and localities, and the manner in which inward investment creates opportunities for local economic development. In this context, embeddedness generally refers to the involvement of foreign firms in host country networks which covers many aspects. Existing research analyzes local embeddedness by considering both inter- and intra-firm dimensions (Turok, 1993; Phelps, 1993; Phelps et. al., 2003), such as factors of affiliate status, R&D activity, local purchases, skills and training demands and repeat investment. Another way of defining the degree of embeddedness in such a set is to estimate the number of connections in relation to possible connections, often called density (e.g. Aldrich and Whetten, 1981; Ghoshal and Bartlett, 1990). A dense network means that there is enhanced diversity and network variety and this provides more finely differentiated networking opportunities for firms, so that network formation, joining, and growth have their own inherent dynamic that is place specific. For instance, location in a big concentration of economic activity or more developed city, in this case Shanghai petrochemical district, for example, may be sufficient to induce more networking than if the firm is located in a smaller centre, at the condition of same intrinsic properties of the firms. The mechanism envisaged here is that the higher network intensity of a bigger city may produce larger positive externality effects which make production more profitable, thus inducing more networked firms, which increases the network density of the city, in a cumulative process.
The level of ‘closeness’ or ‘dependence’ between firms in a specific relationship could be determined by its time orientation (short-term versus long-term), its continuity (measured by the duration of the relationship), and the social, cultural, technological and geographic distance between firms (Nielson, 1998). Time orientation of inter-firm relationships (Ganesan, 1993), defined as the degree of closeness and the dependence between firms, has a direct impact on relationship outcomes. In fact, long-term relationships have been shown to affect both anticipated and achieved performance of interdependent channel members and to generate benefits such as higher product quality and lower prices for buyers (Ganesan, 1993). The ‘closeness’ or ‘dependence’ can also be measured by the actual or expected contribution of a partner to the sales and profits of a firm, and by the replace-ability of this partner (Frazier and Rody, 1991). Other elements of linkages characteristics which have been extensively used in empirical studies include relationship quality and mutual trust (Gupta, 1987; Szulanski, 1996; Kale et. al., 2000). These indicators also capture the closeness of relationship, ease of communication and intimacy of relationship between the recipient and supplier (Minbaeve, 2007; Szulanski, 1996).

In many recent studies, the local relationships have been considered as business networks which are narrowed down to the connections between MNEs and local firms in host countries. As one type of business networks, local linkages obviously vary in terms of their scope, scale and quality. The quantity of linkages is simply the number of linkages formed by the foreign subsidiary or their value in pecuniary terms (Dunning and Lundan, 2008). Linkage scope captures different types of linkages taking place across or within industries, between different types of partners, but with the MNE at the centre of the analysis. Linkage quality includes interactions for non-pecuniary benefits (at least in the short-term) and emphasizes the potential for learning and improvement, particularly the extent of knowledge transfer. If the firm-level impact of foreign-local linkages is to be fully understood, it is not only the quantity or scope of linkages that is important, but the quality of the relationships established between firms (Giroud, 2007; Santangelo, 2009; Scott-Kennel and Enderwick, 2004; Spencer, 2008). The development
potential of local linkages is demonstrated by ‘linkage intensity’ which is the combined influence of three constructs: quantity, quality, and scope of multiple linkages formed by the MNE (Giroud and Scott-Kennel, 2009). The intensity of the relationships becomes stronger, the longer the firms have known each other (Forsgren et al., 2005). From a developmental perspective, the intensity of inter-firm linkages captures their potential for beneficial spillovers (Driffield et al., 2002).

From the aspect of potential for firm capability and resource development via foreign—local interaction, this research focuses on three distinct IFL characteristics. The first characteristic is the ‘strategic orientations of sourcing and sale’, which are illustrated by the extent of local vertical transactions. This IFL characteristic implies the overall geographical pattern of foreign subsidiary’s vertical relationships as they are measured by the percentages of procurement/sale obtained from suppliers/customers in the host region and the rest of the world. In the case where the MNE has established an interrelated network of affiliates and local firms in a host country, a high local orientation implies that local relationships are predominantly with domestic firms and not with the ones in home region or the rest of the world. Specifically, high local orientation of foreign subsidiaries’ supply relationships implies a higher degree of localisation and intensive interaction with independent domestic suppliers. If a foreign subsidiary produces for local customers only, knowledge of the local market becomes far more important than when the affiliate’s customers are predominantly international.

The second aspect characterizing the development potential of inter-firm linkages is the intensity of local collaboration. Local collaboration in a geographical cluster or milieu of technology-intensive firms and related institutions — universities, public research laboratories, training and venture capital organizations are of crucial importance for the growth of firms in terms of access to innovative ideas, new technologies and scientific competencies, opportunities for formal and informal linkages, and a range of benefits from ‘untraded interdependencies’ (Storper, 1995). Institutional perspectives further inform examinations of network embeddedness such as regional development agencies or universities are geared to deepen firm embeddedness by supporting locally based
affiliates in their drive to upgrade and develop their internal capacity (Phelps et. al., 1998; Martin, 2000). Many firms attempt to establish longer-term and more collaborative partnerships with their buyers, rather than using short-term, arm's length transactions, which consequently result in both technical and business-related information exchange between MNEs and local firms.

The third important characteristic is the inter-firm transfer of assistance and resources via IFLs that may involve such as technical equipment, product specifications, and market information (Wong, 1992; Poon, 1996), and even certificate requirement that can help or motivate local firms to raise the standard of their output. If competition overlap exists and for fear of losing their proprietary technology or knowledge, risk of spillovers or maybe financial resources, the foreign subsidiary is likely to be less transparent, more protective of their technology either through explicit or active measures, and restricts the information flow to the local network partners. As a result, this will reduce the degree of resource transfer to allow for freer and greater flow of beneficial diffusion to the local firms particularly the accessibility to tacit knowledge. Transfer content and degree from foreign subsidiaries to local firms are thus direct indications of the local linkage quality, as well as variables to imply the outcome or effect of local relationships.

2.2 Initiation and Conduct of Inter-firm Linkages

Increasingly, foreign-local inter-firm relationships (linkages) are seen as crucial sources of firm growth and competitive advantage, and a number of rich research traditions have grown up to explain the initiation and conduction of local linkages. A few of systemic perspectives of literature have shed light on this implication, including, transaction cost economics (TCE), resource-based view of firm (RBV); social/relational exchange theory (SET), global value chains (GVC), strategic network approach (SNA) and the eclectic paradigm. These theories and approaches are argued to be the antecedents of their linkages activities and linkage effect in host countries.
2.2.1 Firm-related theories

RBV and TCE are related to the economics of the firm. Linkages in this stream of literature are seen as ways in which firms can reduce coordination and transaction costs and leverage internal and external resources more effectively to contribute to the growth and competitiveness.

Resource-based view of firm

The resource-based view of firm (RBV) or knowledge-based, competence-based, capability-based perspective interchangeably, though the emphasis are somewhat different, originates from various disciplines of inquiry, most of which are on the boundary between economics and business study (Foss, 2000). It is one of the most influential frameworks for understanding strategic management and the basic propositions of the RBV have become increasingly well delineated (Barney et al., 2001). RBV argues that under certain conditions a firm’s (a subsidiary’s) unique bundle of resources and capabilities can generate a competitive advantage (Rumelt et al., 1994; Penrose, 1995; Grant, 1991). RBV suggests that firm behaviour can be interpreted as a search to obtain control over those factors of production that can provide them with a competitive edge over their closest rivals (Wernerfelt, 1984; Galaskiewicz and Zaheer, 1999). It also emphasized the notion that resources owned or controlled by the firm have the potential to provide enduring competitive advantage when they are inimitable and not readily substitutable (Peteraf, 1993). Furthermore, the RBV emphasizes strategic choice, identifying, developing and deploying key resources are important tasks to maximize return (Barney, 1991).

Resource-based view of the firm has been used to explain business phenomena in most of the business relationship research. These phenomena include strategic alliance, inter-firm relationship, business group, acquisition, intra-organizational linkage, and buyer-supplier relationship. RBV has been generally assumed that firms ‘somehow’ develop such resources internally. However, scholars argues that these resources and capability are valuable and inimitable (Barney, 1991) and differ across firms (Makadok, 1999). Within an industry or strategic group, RBV recognizes that businesses may control
heterogeneous resources, and that heterogeneity is dynamic. The focus of RBV in terms of linkages therefore becomes how firms search, generate, sustain and develop resource and capabilities through relationships with other firms. According to RBV, relationships between firms are less a result of efficiency considerations and more a result of the firm’s search for resources that enhance competitive advantage. Linkages and coordination investment can thus be a tool to compete and enhance profit performance in a market, and the realization of competitive advantages over time (Jap, 1999). Firm may complement and strengthen their competitive advantages, e.g. by shedding non-core activities to non-equity partners, by getting access to resources such as technologies and know-how, and by sharing the growing costs of research, development and market introduction of new products.

As RBV places emphasis on internally developed resources, and regards the importance of heterogeneous firm assets in securing a firm’s sustainable competitive advantage, key actors in a network can be considered as a bundle of these idiosyncratic resources and obtain capability internally to deconstruct their interests, their strategies and their power to influence network processes. The individual properties or attributes of the network actors are: size and history of the firm, ownership and corporate governance, assets and accumulated resources (including knowledge, technology, capital and market access, interests, values, and expectations, incentives and preferences. Factors that can provide such competitive advantages and resources have distinctive characteristics. They create value for the firm, i.e., they help firms to either reduce cost of inputs, or obtain greater prices for outputs (Barney, 1986). Second, these factors are often firm-specific in nature and are either unavailable outside the creating firm or suffer a diminution in their value if separated from the creating firm (Dierickx and Cool, 1989). In addition, rational capability, which refers to the capability to interact with other companies, also influences the lead firm’s knowledge access and transfer with relevant effects on company growth and innovativeness (Lorenzoni and Lipparini, 1999).

Firm resources include all assets, capabilities, organizational processes, firm attributes, information, and knowledge controlled by a firm—many of which may be intangible
and/or difficult to measure— that enable it to conceive of and implement successful strategies (Gibbert, 2002; Hall, 2000; Huilin and Yeh, 2004; Smith, 2002). Resources are generally broken down into two fundamental categories: tangible resources (financial assets and physical assets) intangible resources (intellectual property assets, organizational assets, reputation assets and capabilities.). Intangible assets include intellectual property such as trademarks and patents as well as brand and company reputation, company networks and databases (Hall, 1992; Williams, 1992). Essentially capabilities encompass the skills of individuals or groups as well as the organisational routines and interactions through which all the firm’s resources are co-ordinated (Grant, 1991). Capabilities are interaction-based, they are even more difficult to duplicate due to causal ambiguity and the RBV literature has tended to favour capabilities as the most likely source of sustainable competitive advantage (Collis, 1994). RBV particularly reveal that valuable knowledge affects firm organization and market contact (Conner and Prahalad, 1996), and enhance competitive advantage through innovation and strategic linkage of products at a point in time and over time (Helfat and Peteraf, 2003). A firm’s geographic location, alliances with other institutions and organizations, and R&D expenditures are representative of knowledge flows (Decarolis and Deeds, 1999), and the geographic locations differ in critical knowledge resources available to entrepreneurs which have positive effects on entrepreneurship intentions and venture creation (Chrisman, 1999). Due to the need for inter-firm resource exchange, organizations try to secure access to important resources and balance asymmetry and reciprocity. Particularly, in some industry such as automotive industry and petrochemical industry, manufacturers depend upon fixed suppliers because of a lack of supply alternatives and, an individual manufacturer may represent a significant proportion of the supplier’s turnover.

Focusing specifically on foreign-local linkages, application of RBV to internationalization is that linkage is a way to access resources in foreign locations that can complement and strengthen the firms’ competitive advantage (Dunning, 2000). The stock of resources developed by a MNE in prior domestic and international operations is a major factor that drives entry into new markets (Dierickx and Cool, 1989; Fladmoe-
Lindquist and Tallman, 1997). A MNE may possess some types of knowledge and utilize them in other countries, which could not only facilitate internationalization but also constrain it. Subsequent FDI of a MNE is considered as an attempt to link to some strategic resources which the investor is lacking, but which are available in a foreign host country (Combs and Ketchen, 1999; Das and Teng, 2000; Madhok and Tallman, 1998). Among the resources typically sought by foreign investors is market knowledge, contacts to local authorities and business environments, or particular assets held by individual firms (Meyer and Estrin, 2001). The linkages therefore are fostered to access and develop local resources, e.g. through a joint venture relationship or by linking up to local agents and distributors which can be combined with the firm’s resources to create new competitive advantage. Foreign investors may further benefit from locating their activities in industrial clusters, thus gaining access to a pool of specialized labour, access to competent suppliers of intermediate goods, more effective transfer and exchange of information regarding consumer preferences or technological developments, and greater opportunities for joint R&D (Meyer, 2003). Therefore, RBV theory emphasizes that linkages via FDI are considered to be a ‘strategic choice’ that enhances, maintains, or restores the investor’s competitiveness in a global market. It also proposes that heterogeneity in firms’ internal resources and capability and, diversity in regional or local context are important sources of differences in firms’ linkages to partners and institutions.

From the perspective of local firms in developing countries, the strategic resources of foreign firms also can provide competitive advantage in emerging economies. Firms in emerging economies attempt to develop the capability of combining the requisite foreign and domestic resources for repeated industry entry (Guillen, 2000). MNEs own strategic assets i.e. knowledge resources such as patents, licenses or brand names, or less tangible capabilities such as general management skills (Barney, 1986; Mahoney and Pandian, 1992; Winter, 1987). As one of core resource, knowledge is developed and codified at the parent firm and diffused to host locations through FDI. Foreign linkages may thus help local firms fill resource gap: firms located in developing countries frequently lack the resources and capabilities that are required to compete in an increasingly globally
integrated economy. This may be due to the relative recent origin of industrial infrastructures or decades of protective and market distorting policies. The resource gap experienced by developing country firms is exposed as developing countries increasingly are integrated into the global economy. Linkages may enable the developing country firms to access strategic resources, thereby bridging their resource gaps in the short run. Moreover collaborations may facilitate joint resource creation by pulling together complementary competencies, skills and factor advantages of the developing and developed country firms.

**Transaction cost economics**

Transaction cost economics (TCE), which originates from 1930s*, is useful in explaining institutional arrangements, and particularly why production is not carried out entirely in the principal firm. The common application of the transaction cost perspective is to explain the choice between markets and hierarchies. However, the transaction cost logic has also been successfully employed to explain intermediate organizational forms, e.g. ‘bilateral governance’ and ‘trilateral governance’ (Williamson, 1986, 1996). Williamson noted the prevalence of network forms of organization where there is some form of explicit coordination beyond simple market transactions but which fall short of vertical integration, and acknowledged networks as an intermediate organizational form. These in-between forms of relationships leading to information exchange between parties (Robertson et. al., 1996) are the focus of this research.

The decision to make or buy will depend upon various transaction characteristics between economic partners (Williamson, 1991). As transaction costs can be difficult to measure directly, additional environmental constructs are included, such as asset specificity, uniqueness, uncertainty and complexity of the exchange, as well as behavioral factors, such as opportunism and bounded rationality (Joshi and Campbell, 2003). TCE is based on the assumption that in a context of asset specificity and uncertainty, long-term oriented inter-firm relationships will minimize opportunism and therefore transaction costs (Williamson, 1979). From this perspective, the focus of a firm is under these circumstances to choosing from transactions spread from discrete
externalized market exchange at one extreme to internalised hierarchical organization at the other, with a myriad of mixed or intermediate forms in between (Thorelli, 1986). Efficiency and cost structures of exchange relationships result on the type and characteristics of relationships between firms. One way to avoid supplier opportunism is to adopt bilateral partnerships, long term relationships, strategic alliances, hybrids and relational exchange (Joshi and Campbell, 2003). Companies nowadays tend to concentrate on their core capabilities and therefore purchase an increasing amount of component parts and services externally (Casson, 2000; Krause et al., 2000); this has led companies, national or multinational, to increased dependence on their supply system and greater vertical linkages. Vertical integration is often related to the necessity to protect knowledge as a result of information asymmetry. If there is small asset specificity and little uncertainty in the market, transactions are frequent and are governed by the market (Williamson and Winter, 1991). It suggests that close ties are a transitional step between market and hierarchical structures, and offer a way for firms to control the opportunistic behaviour of their network actors. Some arguments are that networks are important because they reduce spatial-transaction costs (Camagni and Capello, 2007) and because they reduce uncertainty and adaptation costs by facilitating collective organisation (DeBresson and Amesse, 1991; De la Mothe and Paquet, 1998).

Firm is therefore a complex institutional arrangement including implicit contracts that govern relationships in home and host countries. MNE then could be seen as an internationalized entity that owns assets, and enters into commercial or financial contracts in global dimension. Transaction cost consideration will determine whether MNEs would prefer to enter a host market by establishing a subsidiary or by JV, or some other contractual arrangement. MNEs may be thought of as possessing a set of preferences over the available forms of transacting, and the intensity of these preferences will be dependent on transaction costs and will influence the distance between the rankings of the different options (Gomes-Casseres, 1990). This refers to the issue of vertical integration of the MNE. Another issue raised from a transaction cost perspective is that appropriate linkages may be hard to establish. In developing countries, market failures are – according to some observers – particularly widespread (Rugman, 1981). In
this situation, network of collaborations become particularly important mechanisms for transaction cost reduction (Hoskisson et al., 2000) and organizing activities that could not be organized on pure market terms. The centrality of networking in these economies creates 'disadvantages of foreignness'. In the absence of trust, loyalty and mutual commitment, rigorous monitoring would invariably raise the overall transaction cost of operation in the local environment and may encourage foreign firms to opt for hierarchies rather than collaboration when operating in developing countries. Furthermore, without rigorous monitoring, the foreign firms cannot be sure if the local firms have put forth maximal effort in discharging their economic responsibilities (Eisenhardt, 1989). Thus, from the transaction cost perspective, local linkages can be considered as results of the strategies of MNEs to reduce control cost of hierarchies across countries, while maintaining some of the benefits such as activity control and predictability. On the other hand, transaction costs of maintain a number of arms-length local actors may be too high which enhance risks of opportunism, and international trade cross countries.

The core theoretical discussion behind the MNE's internationalization is the understanding of the complex decision-making behind the production process internal to the firm on a global, regional and local basis, and the decisions being made regarding sourcing. Transaction cost consideration can cause foreign investors to claim more shares and control when confronted with asset specificity or opportunism on the one hand; and firms will opt for less ownership shares or decentralized form when facing uncertainty such as political or economic risks on the other hand (Anderson and Gatignon, 1986; Meyer, 2001). The debate revolves around global value chain within MNEs and the internal flow of intermediate products, parts and components between plants, as well as individual firms' external purchasing behaviour within host economies and from overseas. Depending on the production and transaction costs, as well as extent of coordination and integration of production facilities worldwide, foreign affiliates can purchase inputs internally (that is the manufacturing of inputs is performed by the parent firm, the foreign affiliate itself, or by sister affiliates) or externally (either through import or by sourcing from locally-owned firms or foreign firms established in the host
economy). This initial decision explains a MNE's internalization of activities and suggests that transactions of foreign subsidiary can take place through centralised hierarchy organization by parent firm or through discrete exchanges in global market. Companies nowadays tend to concentrate on their core capabilities and therefore purchase an increasing amount of component parts and services externally (Casson, 2000; Krause et al., 2000); this has led companies, national or multinational, to increased dependence on their supply system and greater vertical linkages.

On the other hand, TCE is criticized: it has serious operational weaknesses (such as the difficulty of measuring transaction costs) and that little empirical evidence supports the assessment of its guidelines (e.g. Jarillo, 1988); it also fails to take into account personal and psychological factors that have an important impact on commitment and therefore on inter-firm relationship continuity (Joshi and Stump, 1999).

2.2.2 Network-oriented approaches to inter-firm linkages

Concepts of nodes, positions, power, trust and information flows in industrial network literature lead to alternative model of MNEs as open interaction networks willing to share control, technology and markets when it is optimal to do so. The external network is strategic choice of MNE as it takes a proactive attitude in the network (Jahanson and Mattsson, 1988), and the positioning of the subsidiary in the external networks depends on its power, embodied by its economic base, it technology, expertise, trust and legitimacy (Thorelli, 1986). The MNE and its corporate or internal linkages are thus expected to be critical for affecting on its external linkages creation and pattern. The network approach of industrial marketing and international business takes an even broader perspective on linkages.

Social/relational exchange theory

The core explanatory mechanism of social/relational exchange theory (developed by e.g. Blau, 1968; Kelley and Thibaut, 1978; Anderson and Narus, 1984) is that relational interdependence is developed over time through exchange interactions. When applied to business markets, SET explains that inter-firm relationships are motivated by self-
interest and expected outcomes, including economic or tangible rewards such as goods or money, or intangible rewards such as social amenities and friendship. Relational exchange notion in SET is characterized by high levels of cooperation, by joint planning, and by commitment and mutual adaptation to the needs of partners in the exchange (e.g. Gundlach, 1994; Hallen et al., 1991). SET is widely used to explain the development process of relationships, which include their formation and growth, and to differentiate motivations and benefits. Following this thinking, SET can explain that MNEs’ motives in term of some benefit outcomes in local networks will determine the initiation and governance of local linkages. However, this theory are also criticized for assuming that relational exchange is devoid of opportunism and that the partners involved are equal; failing to assert clearly that relational governance can supplant formal governance; not being fully able to explain the development of relationships in short-term based relational exchange; ignoring the dissolution process of inter-firm relationships (Lambe et al., 2001). Moreover, SET take into consideration only one side of the buyer and seller dyad, several researchers are calling for a simultaneous study of relationship models from both sides of the dyad (Joshi and Stump, 1999).

**Global value chain approach**

GVC literatures also provide a view for the ‘network’ form of industrial organization. GVC approach stems from a few scholars' works (e.g. Porter, 1986; Gereffi, 1994; Sturgeon, 2001; Gereffi et al., 2005; Dicken, 2007). Porter’s value chain perspective (1986) is relevant from a linkage perspective because individual firms cannot achieve their desired market positions and maintain their competitive advantages solely through their own efforts, but closely linkage to the ability of firms to configure their value chain at a global scale. Recent changes in production systems, distribution channels and financial markets, accelerated by the globalization of product markets and the spread of information technologies, suggest that more attention needs to be paid to external linkages. To this aim, the GVC approach is useful because the focus moves from manufacturing only to the other activities involved in the supply of goods and services, including distribution and marketing, and in particular to understand the strategic role of
the relationships with key external actors (Kaplinsky, 2000; Wood, 2001), particularly vertical linkages (Sturgeon, 2001).

The focus of GVC research is on the nature of the relationships among the various actors involved in the chain, and on their implications for development (Humphrey and Schmitz, 2002). Value chain scholars argue that firms create value not only by basing the help their suppliers to sustain core competencies as well. The concept of ‘governance’ is central to the GVC. At any point in the chain, some degree governance or co-ordination may occur through arm’s-length market relations or non-market relationships, including network of co-operation, quasi-hierarchy and hierarchy (Humphrey and Schmitz, 2000). Alternative relationships will emerge in the presence of different degrees of standardization of products and processes, and of different competencies of suppliers. GVC literature has the merit of exploring the heterogeneity of governance modes but it neglects structural and behavioural differences across global buyers.

From a different perspective and with a focus on MNEs, recent developments in the GVC literature have drawn attention to the variety of value chain relationships wherein global buyers interact with local suppliers in different countries. The mode of governance is essential for understanding whether and how firms in developing countries can gain access to global markets, and benefit from them. However, this line of research places no particular emphasis on the characteristics of buyers, apart from their being global in nature. A number of scholars have recently considered the issue of linkage creation and international transmission of knowledge from the GVC perspective. The focus in their studies is on how firms active in international markets organize the transfer and coordination of complex and strategic information along the value chains (Saliola and Zanfei, 2009). GVC literature develops a more comprehensive analytical framework to evaluate the choice of alternative modes of organizing knowledge transfer and exchange involving global buyers and local firms. The focus will be on vertical relationships between subsidiaries of MNEs in a given host economy, and local suppliers active in the same economy.
Strategic network perspectives

Another different view of network linkages focuses on the dependency between the actors. Strategic linkage theory (Nohria and Garcia-Pont, 1991) and network approach (Johanson and Mattsson, 1987) fall into this category. This perspective is aware of that exchanges are at the core of all business transactions and firms are resource dependent in the fulfillment of their underlying objectives. All firms in a market are considered to be embedded in one or more networks via linkages to their designers, suppliers, subcontractors, customers, and so on. Beyond network theory, strategic linkage theory has been seen as more robust for analyzing the strategic intents and activities operative in the structure of networks. Firms deliberately enter networks on the basis of their own (or partners’) strategic considerations.

Sharing with resource-based view, strategic network perspective also views that a firm’s linkage creation is also likely to be related to its possession of a type of resources. But moreover, network perspective argues that resources do not necessarily have to be internal or owned by the firm itself. Instead, resources may be external to the firm, who cannot achieve desire competitive advantages alone through their own efforts. The external network is strategic as the lead firm will take a proactive attitude in the network (Johanson and Mattsson, 1988). The external network strategy adopted by a firm is closely associated with inter-firm links creation, or network linkages (D'Cruz and Rugman, 1992), involving exchange of information. Strategic linkage theory contends that firms can gain access to desired strategic capabilities by linking to firms with complementary capabilities, or by pooling their internal resources with firms possessing similar capabilities (Porter and Fuller, 1986; Nohria and Garcia-Pont, 1991). Network resources have been viewed as representing the informational advantages associated with a firm’s network of ties (Gulati, 1999). Networks provide access to these resources possessed by other firms, and offer each participating firm the opportunity to exploit and/or explore new resources and opportunities within their operational environments (Koza and Levin, 1998). Similarly, co-operation with partners may serve as a strategy enabling the firm to use its resources or its capacity more fully. However, not all firms possess comparable levels of network resources, and the variation in network resources
across firms influences their individual ability to discover and exploit useful information. Specifically, firms' networks vary in terms of structure, or the pattern of ties, and nodal heterogeneity, or the variation in the mix of contacts in firms' networks (Galaskiewicz and Zaheer, 1999).

The network approaches could be applied to the mechanism through which the subsidiary creates a cross-border network into the host country. Linking to a foreign network is to access the resources that are essential for the investor's long-term survival. When MNEs seek to position themselves in both the international networks of their industries, networks of a MNE go beyond national boundaries and span both vertical and horizontal dimensions of value adding relationships. Strategic linkage theory views FDI as the construction of a link between a host country network and a foreign network, and an attempt of MNE to link to some strategic resources which the investor is lacking but which are available in a foreign country. These relationships offer them the opportunity to take advantage of both location-specific resources in their host countries as well as the resource advantages inherent in their international value chains. Within the boundary of host country, the existing local networks influence the path of future relationship formation by affecting the set of linkage opportunities available to prospective foreign and local collaborators.

Considering networks formation, it can take into account a cooperative aspect (Khanna et. al., 1998). The context for cooperation can influence the kinds of relationships firms may have. Firms employ different networks according to the strategies being pursued. Taking geographical cluster as an example, by linking the firm's internal capabilities with its external network resources, it proposes to understand and explain differences in competitive capabilities among firms in a geographical cluster. The geographical clusters suggests that firms are embedded in highly differentiated ways that link them to different sets of players and thereby present them with sharply distinct opportunities and constraints.
Generally, motivations for entering relationships are based on benefits to firms in general from networks and relationships (Burt, 1992). Collaboration may be driven by different strategic intents simultaneously, leading to numerous relationship portfolios (Johnson and Selnes, 2004). Strategic choice sees relationships as intended and chosen, though one may make a distinction between purposive action and what is a 'by-product of other activities' (Araujo et. al, 1998) or between a purposive system (where the objective is given to the network from outside) and a purposeful system (in which the objective emerges from inside) (Biggiero, 2001). Cooperation or long-term relationships may be motivated by efficiency, through risk and cost reduction, advantages of scale, scope and speed, access to or using resources more efficiently and effectively, and economising on transaction costs even to the extent of vertical quasi-integration advantages of linking complementary skills in value chain (Bleeke and Ersnt, 1991; Contractor and Lorange, 1988; Larson, 1992; Powell, 1998). The culture and social background of the participants have also been argued to shape the evolution of network structure and the choice of ties within the network by individual firms (DiMaggio, 1992; Gulati, 1999). Proximity (Dyer, 1996) between companies is very important factors too.

Many scholars have emphasized both internal and external stimuli for co-operative network building. Their research identified factors internal to the individual firm, arising from a situation within an interaction, or environmental developments (Håkansson and Snehota, 1995; Child and Faulkner 1998; Easton 1992; Ford 1990; Hakansson and Johanson, 1990; Hakansson and Snehota, 1995; Juettner, 1995). The categories that measure actor attributes in a network are generally interpreted as factors that affect actor's behaviour, and as behavioural choices or how actors engage in network relationships and transactions. Meanwhile the properties and attributes of the network actors are very much framed by their presence in various geographic locations, with complex spatial or geographical structure (Dicken, 1992). Network relationships are central to the concept of local embeddedness of economic action (Granovetter, 1985), and were traditionally regarded as being geographically bounded. In addition, Doz, Olk and Ring (2000) argued that the process of networks formation can be dominated by three initial conditions: environmental changes that lead to an interdependence, presence
and identification of common interests among potential members, or intervention of a triggering entity. Nature of three factors of the network: activity links, actor bonds and exchange ties interact, change over time, and develop within relationships (Håkansson and Snehota, 1995). Koka, Madhavan and Prescott (2006) has brought up a framework explaining patterns of network change as driven by environmental changes moderated by firm strategic orientation. Network change or evolution may be brought about by changes in actors’ resources or information bases or in their expectations (Ebers and Grandori, 1999), and the specialised pursuit of distinctive competence (Yarnell and Peterson, 1993).

In the above respect, links to the networks in host countries are usually initiated by the firm’s national networks which entail the development of MNEs’ internal motivations. A firm’s position in the networks of home country prescribes its process of internationalization because that position determines its ability to mobilize the resources within the network for such an endeavour (Johanson and Mattson, 1987). In other word, the amount that an investor can and should invest in local linkages in the host country depends on its prior position and experience in the domestic network (e.g. Powell and Kenneth, 1996, Shan, et. al., 1992, Walker, et. al., 1997). For example, small firms in Taiwan’s loosely structured small-firm networks usually take independent actions when making FDI (Chen, 1998). A dominant firm in the Japanese keiretsu can orchestrate concerted actions among keiretsu members to penetrate jointly a foreign market, or to establish a production system in a foreign location similar to that at home (Ozawa, 1993). These studies imply that MNEs rely on resources within the national networks to support their overseas operations, at least initially. Therefore, resources within the network and the structure of the network, in addition to firm-specific internal resources, chart the intention and courses of a firm’s overseas network formation.

2.2.3 The eclectic paradigm

MNEs that own and control production activities in multiple countries play dominant role in the conduct of international business. FDI is an effort to manage business relationships within a business network, and MNEs attempt to access external resources
in order to offset their weaknesses (Holm et. al., 1996) by inducing inter-firm as well as intra-firm linkages. From this point of view, literature explaining MNEs’ activities and strategies may draw on the implications for their networking and inter-organizational relationships formations in the host country.

Since the eclectic paradigm (Dunning, 1979, 1988, 1993, 1997, 2000), scholars active in the field of international business have sought to examine the importance of location-factors and firm-specific factors in shaping MNEs’ international activities, FDI, as well as the development of many emerging economies. It is broader than other theories on internationalization in the sense that it would be incorrect to place it squarely in one of the above categories. Eclectic theory integrates several strands of international business theories on cross-border business activities and provides a unifying framework for determining the extent and pattern of foreign-owned activities. An integration of firm-specific and country-specific factors has been used in examining these advantages. It has been argued that international business enterprises require a combination of strategic resources provided by foreign firms and locally based resources in order to achieve competitive advantage (Dunning, 1988; Teece, 1986). These factors would affect the net benefits a MNE receives from local networks and their attraction to potential network partners. Dunning (1988, 1997) and Dunning and Narula (1994, 1996) further developed an Investment development path (IDP) framework to the interaction between FDI and economic development of nations, which proposed that dynamic change in a country’ comparative advantage affects foreign firms’ locational advantages, ownership advantages, and therefore patterns of FDI flow. They argue that patterns of inbound and outbound of FDI of a particular country in the real world vary according to resource endowment, economic system, and government and organization of economic activity. It identifies both the ownership advantages of FDI firms as well as location-specific advantages provided by the host country. For example, the nature of national networks resources may also shape the globalization strategies of indigenous firms, and consequently affect their activities overseas, or the differences in national resource pool and market structure could lead MNE firms to pursue different globalization strategies (Li, 1994).
**Firm-specific factors**

As concerned in Eclectic theory, firm specific factors of MNE are one of the foundations to decide FDI activities. Including the traditional factors related to the firm-specific advantages (FSA), a variety of factors related to the strategy and operations of the foreign firm that are known to impact the firm's operations and performance. For instance, there are interactions between various strategic dimensions of the MNE subsidiaries, as well as forms and types of FDI by MNEs have different impacts on the host economy.

Ownership and internalization advantages are firm-specific advantages that emanate directly from resources owned or controlled by a firm. Including Dunning (1988), a few other scholars suggest a number of potential FSAs that associated with the size of firm such as economies of scale or product diversification (e.g. Reid, 1982); the management of organizational expertise; international experience (e.g. Douglas and Craig, 1989; Erramilli, 1991); extent of international business involvement, and available resources (e.g. Terpstra, 1987); strength of a firm’s technological competence (e.g. Shaver and Flyer, 2000); the ability to acquire and upgrade resources; product differentiation; marketing economies; and access to domestic markets. He also lists the ability to foresee and take advantage of global production and marketing opportunities; capital availability and financial expertise; access to natural resources; and the ability to adjust to structural changes. As far as firm-specific characteristics are concerned, a firm’s capabilities and constraints, or strengths and weaknesses influence their choice of marketing strategy and ability to execute a chosen strategy (Aaker, 1992). These resources of a firm constitute its sources of sustainable competitive advantage (Day and Wensley, 1988). Possession of such resources enables a firm to identify the idiosyncrasies in foreign markets, develop the necessary marketing strategies, and implements them effectively, thus achieving higher marketing performance (Cavusgil and Zou, 1994).

MNE Subsidiaries are expected to take on various strategic roles (Gupta andGovindarajan, 1991), when manufacturing activities are moved to a foreign location.
Numerous typologies of MNE and subsidiary roles and strategies have been developed in the literature (for a review, see Paterson and Brock, 2002), including entry, business and sourcing strategies. These strategies conform to the basic assumption of network theories which is that resource and capability development can occur at the level of the subsidiary and not only at that of the MNE as a whole.

As discussed toward the concept and dimensions of inter-firm linkages, sourcing strategies of the MNE are undoubtedly the antecedents of their subsidiary's vertical linkages intensity that is the propensity of MNEs to link up with local firms in the locations where they operate. Sourcing strategies at the subsidiary level are important to both the foreign venture and parent company because it involves the allocation of important parts of the parent firm's value chain in one particular country. Sourcing strategy broadly refers to identifying which production units will serve which particular markets and how components will be supplied for production (Kotabe, 1992). MNEs could increase or decrease their sourcing activities through their foreign subsidiaries. The combination of MNE's procurement and sale constitutes the major sourcing domain and reflects the strategic objective that the operation located in a foreign country to serve even these components are only a small part of a global operation of a MNE. Since sourcing is conceived as an integral part of the firm strategy, types of sourcing used could be associated with strategic factors (Murray, 1996). There is a natural fit between sourcing as an integral part of overall subsidiary strategy and other strategic dimensions (Swarnidass, 1993). In recent years, studies focus on fundamental change in the way MNEs are organizing their international activities, and the surge in global sourcing and global integration within the MNEs is widely studied by IB scholars (e.g. Zaheer and Manrakhan, 2001; Dicken, 2003). Embedded in the literature of intra- and inter-firm trades, a number of sourcing strategic types are identified, which are categorized as internal and external or they could use multiple sourcing strategies simultaneously. What has received less attention is their impact on inter-firm linkages.

FDI at the initially stage was defined as a process of acquiring ownership of assets for the purpose of controlling the production (Moosa, 2002). Ownership comes with three
fundamental rights 'the right to possess an asset or its financial value; the right to exercise influence over the use of the asset; and the right to information about the status of what is owned' (Pierce, Rubenfeld and Morgan, 1991). Regardless the desired ownership type, or what types of ownership are available, the choices are evaluated in terms of the level of control, the cost of resource commitments, and the conditions of risk and uncertainty (Erramilli and Rao, 1993; Hill et. al., 1990; Kim and Hwang, 1992; Brouthers, 1995). The formal control via ownership entitles a subsidiary the rights to exercise control proportionately to the share of equity held. Majority control affords firms the greatest amount of control over their foreign operations and enable firms to vertically integrate the desired activity into the organizational hierarchy (Anderson and Gatignon, 1986; Hill et. al., 1990). Ownership selection is an important strategic decision in international expansion, since it is tied to an MNE's core competency contributions, control over subsidiaries, parent-subsidiary relations, and vulnerability to external changes in a host country (Gomes-Casseres, 1990; Hill et. al., 1990; Root, 1994). The FDI relationship consists of a parent enterprise and a foreign affiliate which together form a MNEs in order to qualify as FDI the investment must afford the parent enterprise control over its foreign affiliate. MNEs are frequently confronted with restrictions about the ownership structure of their foreign operation by local governments. In particular, developing and transition countries often impose shared ownership agreements, hoping that this might facilitate beneficial technology spillovers for their local industries. Governments are also interested in equity shares and sometimes impose ownership restrictions to tilt the distribution of projects rents in favour of their nationals, although this may discourage FDI. This policy issue has gained prominence in the past two decades because few developing countries have attracted sizable FDI despite the worldwide surge in FDI flows. By choosing an ownership type that fits internal capabilities, strategic goals, and environmental contingencies, an MNE can also prevent exposure of distinctive technology mitigate transactional hazards that could be precipitated during resource dispersal or interactions with contextual forces, and boost economic rents earned from tacit knowledge (Anderson and Gatignon, 1988; Penner-Hahn, 1998; Woodcock et. al., 1994).
The investment motives of MNE are important not only for intended, but also for realized strategies, because the purpose of the investment is to obtain advantages of common ownership, of internal division of activities and capabilities, or advantages of implementing similar activities and capabilities in different locations (Dunning, 1993a). Depending on the nature of the advantages that firms are seeking, Dunning (1993, 2000) made a distinction of four types of FDI strategies, which are associated with various location-specific factors which reflect comparative advantages of the location of FDI, and subsequently affect the strategies and performance of MNEs. According to Burt’s (1992) efficiency and effectiveness principle, FDI will not be undertaken unless these relationships link to distinctive resources that are unavailable at home country because it is more costly to build new relationship in a foreign country than in the home country. The resources sought for in overseas locations may be natural resources, cheap labour or local technological capability, management or marketing experience (Dunning, 1993a). Resource-seeking FDI is driven by the availability of abundant natural resources in a host location, including oil resources, electricity or water that are important for some types of manufacturing. Market seeking FDI is driven by the existence of an extensive and prosperous domestic market that requires firms to be located in proximity to their customers, and also MNE undertaking this type of FDI are likely to be potential gains from economies of scale in production and distribution activities as well as in servicing the market. Additionally, tariffs and other barriers to trade may also encourage such investment. Efficiency seeker are companies investing to tap into resources and assets abroad, which is mostly driven by the international competitiveness of a host country as a location for export-oriented production, low cost of labour, transportation cost. Strategic asset-seeking FDI is driven by the strategic objectives of MNEs to pre-empt the acquisition of strategic assets by their competitors. Investors choose a location of investment according to the expected profitability associated with each location (Campos and Kinoshita, 2002). In recent decades foreign investors in developing countries have moved towards efficiency seeking investment motives as indicated by the emergence of globally integrated production systems and networks (Evans, 1998; Cypher and Diez, 2004). A different sub-classification of FDI motives is put forward by UNCTAD (1998a) that is exported-oriented and market-oriented investment.
Developing countries' import-substitution policies created favourable demand conditions for local production, as market-seeking investment in a host country is often a substitute for exporting to that country. In terms of productivity spillovers in China, the market-oriented FDI, which aims to penetrate China's domestic market by selling their products locally, may generate spillovers through intensifying competition, in addition to demonstration spillovers. The export-oriented FDI, which produces goods for exporting, may not have competition spillover effects on domestic firms. In this regard, investments in developing countries are playing greater roles in the strategies of MNEs, creating global efficiencies through economies of scale and scope and through access to complementary assets such as innovative capacity (Hansen et. al., 2007).

Furthermore, firm-specific advantages also reside at the subsidiary level and are unique to that subsidiary. Literature focusing on MNE group networks considers that ownership-specific advantages do not have to be tied to the home country (Rugman and Verbeke, 1992), but can instead be acquired or developed by the subsidiary itself. In the course of an earlier study (Moore and Heeler, 1998) of mandated and non-mandated subsidiaries in a medium size economy it was noted that subsidiaries in the same country and same industry varied in their ability to achieve international responsibilities, from none to multiple global subsidiary mandates. These findings suggested the existence of subsidiary-specific factors represent advantages which are neither location advantages nor ownership advantages, but are located at the subsidiary level and not shared across the MNE, as are ownership advantages.

**Host market environment**

The country-specific advantages have brought about considerable research attention in explaining why FDI occurs in China, and whether location matters for performance of foreign subsidiaries. Host country factors such as economic growth rates, labour costs, availability of skilled labour and technology, government regulations, and topographical characteristics, can affect the success of FDI.
Although the attributes and the business environment of MNEs are so closely inter-related, there are enough differences to keep them separate as two distinct factors. Once the decision to enter a given market through FDI is taken, the kinds of activity and the level of competence of the subsidiary are co-determined by the nature of the location advantages of the host location. That is to say, while MNE internal factors such as their internationalization strategy and the motivation of their investment are pivotal in the structure of their investment, they are dependent on the available location-specific resources which can be used for that purpose. Host countries possess distinctive physical, economic, and political attributes including economic growth rates, labour costs, availability of skilled labour and technology, government regulations, and topographical characteristics, can affect the success of FDI (Lipsey, 1999). Businesses respond to their environment either to develop and exploit opportunities or to react to perceived threats (Andrews, 1987). Chandler (1962) is an early contributor to a long tradition of research on the relationship between environment and strategic behaviour. He suggested that changes in strategy, and in structure, are directly related to changes in the market or in general in the firm-relevant environment. Other scholars (i.e., Venkatraman and Prescott, 1990) made important contingency theory contributions and to a flurry of theories and studies that have confirmed the close relationships between environment, strategy and structure. The nature of the host country environment and policy is a further constituent of the framework in Dunning's eclectic paradigm is helpful in understanding the influence of location variables (e.g. the level of economic development and industrialization, infrastructure and cluster development) on the establishment of the subsidiary and, by inference, on role 'determination'. Researchers from an organizational perspective have also proposed that the subsidiary operates within its own task environment that determines or constrains its activities (Ghoshal and Bartlett, 1990). This environment comprises customers, competitors and suppliers, as well as government bodies and the incentive programs they offer (Birkinshaw and Hood, 1998). As the primary determinant of the quality of the FDI, host country's location advantages also play an important role in determining the level of embeddedness of the subsidiary (Benito et al., 2003).
Another stream of research suggests that the relevance or importance of a particular firm-specific advantage may be contingent upon the characteristics of host locations. Several authors, including Buckley (1990), Casson (1987) and Dunning (1980, 1988), have stressed that a MNE’s firm-specific advantages should be considered in relation to competing enterprises or in reference to the competitive environment in host countries. Accordingly, a given firm characteristic or resource may represent an advantage to the firm only in the context of a particular host location. For instance, a technologically-intensive U.S. MNE may conceivably enjoy a greater advantage over firms in less-developed countries than those in developed countries. The host country becomes especially important in studies dealing with FDI, when the different configuration of host country factor endowments, demand conditions and competition can either strengthen a firm’s advantages or render them redundant (Dunning, 1995; Itaki, 1991).

Location- or country-specific advantages are defined as ‘the national factor endowments of a nation (the resources, networks, institutional structures, or other advantages)—basically the variables in its aggregate production function’ (Rugman and Gestrin, 1993). Location-specific advantages also refer to the host country-specific factors including country risks and location familiarity (Hill et. al., 1990). Here Dunning (1988) suggests a number of potential country-specific advantages: input cost advantages, such as low wages and the availability of cheap natural resources; labour productivity; the size and character of markets; transport costs; and the psychic distance from key markets to the home country of the MNE. There are also tariff barriers, the taxation structure, risk factors, attitudes toward FDI, and the structure of competition.

The geographical scales matter in the study of firm location, because at different scales, FDI firms have to consider respective predominant location factors. Most of the existing studies have focused on country-level analysis of MNE activities, but what attracts interest in this research is that foreign subsidiary locations vary not only among national markets, but also within national borders. The sub-national region, understood as ‘territories smaller than their state possessing significant local governance capacity and cohesiveness differentiating them from their state and other regions’ (Cooke et. al., 1997). Just as between country differences may be important determinants of where
MNEs decide to locate their overseas activities, regional distinctions within countries may also influence the location of FDI (Srinivasan and Mody, 1998). In many cases foreign firms need to respond to local rather than national boundaries of markets and institutions (e.g. Dollar et. al., 2003), when the intended foreign investors may first decide the destination country, then region and city, and finally development sites, while in other occasions a specific location within this country are simultaneously chosen.

Regional differences, such as manufacturing density, population and infrastructure (Coughlin et. al., 1991), local government incentives (Ohmae, 1995; Donahue, 1991; Dunning, 1998b) and the level of economic development (Bagchi-sen and Wheeler, 1989), have all been found to influence MNEs' location decisions. MNEs appear to locate their production units in a region or city within a country to possess distinctive sources of competitive advantage for MNEs' FDI activities e.g. core areas having a relatively high intensity of economic activity and the necessary infrastructure. In addition, intra-regional diversity with respect to economic development and legal and policy frameworks is quite apparent, even within the coastal regions where the government offers incentives to attract foreign investment (Rondinelli, 1987).

Specifically, China cannot be modelled as one integrated market since regions within this country are characterized by diverse conditions and heterogeneous policies. Despite the open-door policy and the program of economic development in place since 1979, there is still a large gap in the pace of change between east coast regions and the rest of the country. As a novel type of industrial establishment, FDI firms in developed special areas, such as export processing zones, free trade zones, and special economic zones (SEZs) have exhibited some unique characteristics. FDI located in open economic zones enjoy more financial and operational privileges than those in non-open areas (Luo, 1998).

**Home market environment**

When a MNE starts operation abroad, the essential link between the parent firm and the subsidiary in the host country is FDI inflow. The first step in the analysis of FDI related phenomena is always directed to the type of FDI. It is also of great importance to
distinguish between different categories of foreign investors to properly understand the effects of FDI (Buckley et. al., 2007). FDI is not a uniform flow of capital across borders and should not therefore be treated as such. Rather, relationship between FDI and growth in transition economies differs by the size and mode of entry (e.g. Mencinger, 2003); the nature of the (production) techniques chosen; the characteristics of MNE (e.g. Egelhoff et. al., 2000); the role of the affiliate in the global production network; the type of activity that takes place; and the aim with which the investment is made (Lall, 1995; Dunning, 1993b; Jones, 2005). Diverging empirical results have prompted several researchers to look for explanations for these differences. Two sets of factors that could potentially influence the FDI-economic growth relationship have been identified: the characteristics of FDI and the host country environment (Görö and Strobl, 2001).

Comparative studies of firms from different countries indicate that firms of different countries-of-origin vary in many aspects. Dunning (1988) finds that patterns of FDI contrast according to country of origin because operational and financial synergies accrued from the interaction between location advantages and ownership advantages differ. A study of managerial goals of foreign business in Korea shows stark contrasts between US, Japanese and European companies (Chung and Lee, 1989). The significant differences were also found to exist in business organization and control (Whitley, 1991). In particular, Lall and Siddharthan (1982) found that the type of firm-specific advantages enjoyed by non-American MNEs may be very different from those of U.S. firms. For example, while high technology and product differentiation tend to drive the growth of U.S. MNEs overseas, the authors found neither plays an important role in the investment decisions of foreign MNEs operating in the U.S. Along similar lines, a variety of studies have identified unique advantages possessed by new emerging MNEs, such as small-scale and labour-intensive technology, undifferentiated products, and low costs, all resulting from the particular resource endowments in their home countries (e.g., Giddy and Young, 1982; Wells, 1983; Kumar and Kim, 1984; Lecraw, 1993). Though not explicitly stated, home-country influences are very much at the heart of investigations involving U.S. and other developed-country MNEs as well (e.g. Gatignon and Anderson, 1988). The early attempt to investigate the existence of countries-of-
origin effects in FDI in China had found the presence of country-of-origin effects in both location-related factors and industry-related factors (Schroath et. al., 1993). Culture is the essence of management, and the cultural background difference between the East and the West effectively affect management decision. For example, large culture distance between home and host countries has a positive influence on the Japanese firms' choice of high control mode (Padmanabhan and Cho, 1999; Anand & Delios, 1997) further confirm the finding when they examine foreign expansion by Japanese wholesalers and retailers. On the other hand, the unfamiliarity may also lead investors to share control with local partners. Empirically, the foreign investors can share risk with local partners and avoid costly mistakes in the new environment (Agarwal, 1994; Erramilli, 1991).

Relatively, the cultural distance between the home and host countries has been shown to affect various aspects of MNE activity. Lecraw (1993) argues that the rationale and behaviour of FDI is likely to be heterogeneous across source countries because the correspondence between home and host market structures varies with investors' geographic origin. The larger the distance, the more difficult the acquisition of local knowledge and the understanding of local norms and traditions is likely to be. Meanwhile, theories suggest that ownership advantages and the motivations for FDI vary with the nationality of the investor. When the foreign project is formed between firms of different nationalities or operated in international market, strategy adjustments appears to be necessary. Large cultural distance leads to high transaction costs for MNEs investing overseas, and suggest the importance of investors' selection of high or low control mode when faced with large cultural difference (Anderson and Gatignon, 1986). Unfamiliarity with the host country's culture and local management gives investors incentives to internalize so that they can control their foreign affiliates more effectively.

2.2.4 Empirical research on the determinants of inter-firm linkages

This section aims to review main research streams on the determinants of inter-firm relationships and linkages within international business area. The existing empirical
studies provide a broad perspective of significant predictors of overall linkage formation or effect, but are not able to conclude with the mixed and conflicted results. Table 2.3 below summarized major studies of investigating determinants of local linkages. This summary also covers some studies to the interchangeable concepts of local linkages, such as spillover, local sourcing, and value chain strategies. In all, these factors can be classified into MNE and subsidiary-specific factors, industrial and inter-firm relationship factors and macro level factors of host country.

### Table 2.3 Empirical studies on the determinants of local linkages

<table>
<thead>
<tr>
<th>Factors studied</th>
<th>Authors</th>
<th>Findings</th>
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<tr>
<td>Micro-Level—MNE or Subsidiary-specific factors</td>
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<tr>
<td>Potter et. al. (2003); Larimo &amp; Tahir, (2003); Jaworick et. al. (2004)</td>
<td>Spillovers were more likely to be generated from the activities of U.S. investors, but argued that this was also likely to apply to the subsidiaries of European MNEs.</td>
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<tr>
<td>Oliver &amp; Wilkinson (1992); Garrahan &amp; Stewart (1992); Murray et. al. (1995); Williams (1999); Egelhoff et. al. (2000)</td>
<td>U.S. and European subsidiaries as opposed to Asia/Pacific counterparts influenced the development of supplier linkages.</td>
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<tr>
<td>Lim &amp; Fong (1982); Dobson (1993); Dobson &amp; Yue (1997)</td>
<td>Japanese firms are the least aggressive in promoting the establishment of locally-owned supplier firms since they already rely on well established Japanese suppliers</td>
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<tr>
<td>O’Hallachy (1984); Dunning (1993 and 1997)</td>
<td>Japanese subsidiaries of did not have lower backward linkages at the national level than those from other countries, whereas American MNEs tend to favour an arm’s length approach</td>
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<tr>
<td>Driffield &amp; Noor (1999); Belderbos et. al. (2001); Tavares &amp; Young (2002); Crone (2002)</td>
<td>Nationality of the parent had no relationship with the extent of local input linkages</td>
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<tr>
<td>Chen (1990)</td>
<td>Developed country MNEs are more dependent on their parent firm and on intra-firm trade, and have a smaller proportion of local suppliers than those from new emerging economies</td>
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<td>Bell &amp; Marin (2004), Birkinshaw &amp; Hood (1998); Todo &amp; Miyamoto (2002)</td>
<td>Technology transfer diverse among foreign affiliates, their strategies, autonomy and capabilities</td>
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<tr>
<td>Belderbos et. al. (2001)</td>
<td>Positive but weak influence of the operating experience of subsidiaries and the local content ratio.</td>
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<tr>
<td>Görg &amp; Ruane (1997)</td>
<td>Age of the plant, per se, is not significantly related to backward linkages</td>
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<tr>
<td>Driffield &amp; Noor (1999); Giroud &amp; Mirza (2006); Ivarsson (2002); Tavares &amp; Young (2002); UNCTAD (2001)</td>
<td>Linkages mainly local sourcing tends to increase overtime as affiliates become more embedded in the local economy</td>
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<tr>
<td>Blomström &amp; Kokko (1997)</td>
<td>The previous history of interaction and other relations provide comparison levels from which to judge performance and other aspects of relationship functioning</td>
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<tr>
<td>Subsidiaries' roles or strategies</td>
<td>Source(s)</td>
<td>Notes</td>
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<tr>
<td>Giroud &amp; Mirza (2006); UNCTAD</td>
<td>Greater autonomy given to the affiliate has been associated with higher</td>
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<td>(2001); Cantwell &amp; Iguchi (2005);</td>
<td>levels of foreign subsidiaries' vertical linkages</td>
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<td>Jindra et. al. (2009), Williams</td>
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<tr>
<td>(1997); UNCTAD (2001); Giroud &amp;</td>
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<td>Mirza (2004); (Dicken, 1998);</td>
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<td>Gupta &amp; Govindarajan (2000)</td>
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<tr>
<td>Tavares &amp; Young (2002)</td>
<td>Positive significant relationship between foreign affiliate' role and</td>
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<td>import propensity of input.</td>
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<tr>
<td>Driffled &amp; Noor (1999), Tavares</td>
<td>Propensity of foreign affiliates to forge local linkages is affected by</td>
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<td>&amp; Young (2002); UNCTAD (2000a),</td>
<td>the motive for investing in a host country: market-seeking, efficiency-seek-</td>
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<td>Altenburg (2000), Belderbos et.</td>
<td>ing and resource-seeking motives for investment encourage higher levels of</td>
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<td>al. (2001), and Dicken (2003)</td>
<td>input linkages</td>
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<tr>
<td>Bell &amp; Marin (2004), Birkinshaw</td>
<td>Technology transfer diversity among foreign affiliates, their strategies,</td>
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<td>&amp; Hood (1998); Todo &amp; Miyamoto</td>
<td>autonomy and capabilities</td>
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<td>(2002)</td>
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<tr>
<td>Ivarsson &amp; Jonsson (2003)</td>
<td>Strategic asset-seeking investment motive encourages collaborative</td>
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<td>linkages</td>
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<tr>
<td>Belderbos et. al. (2001)</td>
<td>Local firms acquired by foreign MNEs rather than Greenfield subsidiaries</td>
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<td>established by the MNE were more integrated into the local economy.</td>
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<td>Chadee &amp; Qiu (2001); Pan &amp; Chi</td>
<td>EJVs are considered to have the potential to be particularly beneficial</td>
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<td>(1999)</td>
<td>to the country, because of positive spillover effects</td>
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<td>UNCTAD (2001); Chen et. al. (2004);</td>
<td>foreign ownership is related to the supply linkages of foreign affiliates</td>
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<td>Hansen &amp; Schaumburg-Müller (2006)</td>
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<td>Javorcik &amp; Spatareanu (2003)</td>
<td>positive horizontal spillovers from fully-owned foreign affiliates but not from partially-owned affiliates in firm level data</td>
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<td>Blomström &amp; Sjöholm (1999)</td>
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<tr>
<td>Driffeld &amp; Noor (1999); Eberhardt</td>
<td>No relationship between 'joint ventures' and local supply linkages</td>
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<td>et. al. (2004); Tavares and Young</td>
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<td>(2002)</td>
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<tr>
<td>Dimelis &amp; Louri (2001)</td>
<td>The degree of domestic ownership matters with respect to the magnitude</td>
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<td>of spillovers</td>
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<td>Blomström &amp; Sjöholm (1999)</td>
<td>No effect of foreign equity share on knowledge diffusion</td>
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<tr>
<td>Battat et. al. (1996); UNCTAD</td>
<td>Size of the foreign subsidiary is positively related to the extent and</td>
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<td>(2001); Chen et. al. (2004);</td>
<td>intensity of vertical linkages with domestic firms</td>
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<tr>
<td>UNCTAD (2000b), Mowery et. al.</td>
<td>Competencies and absorptive capacity of the local firms and industries</td>
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<td>(1996)</td>
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</table>

**Entry mode**

**Subsidiary Size**

**Local firm**

**Meso-level factors—Industry, inter-firm Relationships**

<table>
<thead>
<tr>
<th>Industry sector</th>
<th>Source(s)</th>
<th>Notes</th>
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<tr>
<td>Ivarsson (2002), Blomström &amp; Kokko (1998)</td>
<td>Companies in highly competitive industries may be more likely to engage in local innovation and form alliance and technology sharing agreements with domestic firms</td>
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<tr>
<td>Kogut and Chang (1991); Kokko (1994); Perez (1997); Ozawa (1996); Kokko, et. al. (1996); De Mello (1997); Görg and Strobl (2003); Blomström and Kok (1998)</td>
<td>Spillover benefits to local industry are fewer where capability and technology gaps between foreign and domestic firms</td>
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<td>Fröbel et. al. (1980); Buckley &amp; Casson (1986)</td>
<td>The ways in which MNEs procure intermediate goods and components, assemble and manufacture finished products, and distribute and market them, vary widely one another in a host country's industries emphasizing the prevalence of vertical inter-affiliate trade in engineering industries.</td>
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</table>
From a broader perspective of the linkage concept, there has been substantial body of prior research in the areas of business networks particularly on issues of structure, formation, motivations, functions and processes. As is the growing area of agent-based models of networks, the majority of recent work on inter-organizational networks is about explaining how and why organizations form ties and select partners whether interlocking directorates or alliances or supply chains. Although this stream is not directly relevant and not concluded in the above table, those studies are worth to mention as they provide some insights on the causes of diverse networks phenomena, and the investigated factors are applicable to explain the characteristics of local linkages.

Wider literature on the impact of MNEs on host country development suggests that the nature of the subsidiary’s strategy and activities in the host economy may play a crucial role in determining the extent and pattern of local linkage formation. One way to
describe this heterogeneity of FDI is by looking at the degree of ownership of MNE’s subsidiary in host country. Moran (2001) shows in a number of case studies, MNE’s investment is quite heterogeneous with respect to its relationship with local firms, which can be assumed to have implications for any spillovers. Drawing evidence from several case studies suggests that MNE affiliates being part of tightly integrated networks of production develop more durable and relevant contacts with domestic suppliers. There is also some evidence to suggest that ownership form influences linkage formation. Research has tended to over-emphasize ‘Greenfield’ or new investment disproportionate to its share of total FDI in developed countries partly because Greenfield FDI has more easily measurable impacts such as capital, technology transfer and employment. In contrast, the impacts of alliance and merger FDI occur over time and are more difficult to measure (Enderwick, 1998).

However, there are several limitations of the current literature for our understanding of how the activities of foreign affiliates impact on domestic firms. Studies that have used firm-level data have not found any conclusive relationships. However, overall, empirical research in this area is not well-established and specific relationships between types of linkages and types of subsidiaries are still being explored. One stream of studies though suggests that the developmental impact of foreign subsidiaries via vertical linkages is highest when these firms demonstrate enhanced autonomy and initiative, and when they possess technological competencies. Existing empirical studies analyze the age of the foreign affiliate as a proxy for the level of embeddedness in the host economy. Measured by input import propensity or local sourcing, the age of the foreign affiliate is negatively associated with backward linkages.

There is not sufficient support in the literature for the proposition that levels of local linkages vary depending on the country of origin of the parent firm. Most studies have been concerned with EU and U.S. subsidiaries. Most studies that found a relationship between the origin of the parent company and the degree of backward linkages looked at productivity gains using panel data rather than specifically analysing input linkages. There is some evidence that EU firms form stronger local sourcing propensities in host
economies. Other evidence shows variations even between EU countries. Besides western MNEs, much of the work in this field is dominated by the study of the subsidiaries of Japanese MNEs, consistently indicated that Japanese-owned subsidiaries had a higher propensity to import. These studies argue that Japanese foreign subsidiaries are likely to be closely integrated with their parents, importing a large volume of components and not building local supply chains. Until recently, a few more investigations have been concerned with subsidiaries from developing countries in Asia and Africa. Overall, studies have not indicated a strong country of origin effect when explaining local linkage behaviour.

Studies suggest that the network of linkages between MNEs and local enterprises is denser and more extensive in some regions than others. The literature in economic development and economic geography highlighting the positive impacts of input linkages on regional economies has a long history. Such work has been incorporated into the MNE literature through studies of inter-firm linkages between MNEs and host country suppliers. Several studies have found that linkages mainly local sourcing tends to increase overtime as foreign affiliates become more embedded in the local economy. Empirical studies of the FDI location decision have uncovered the importance of agglomeration effects emanating from clusters of inter-firm linkages (Wheeler and Mody, 1992; Harrison, 1994; Audretsch and Feldman, 1994). One possible explanation of the agglomeration effect is that information flow within local networks and institutional thickness (Amin and Thrift, 1994) underlying these networks make it easy for a potential investor to establish itself in the local networks. In other words, agglomeration increases the possibility of mapping potential investors with foreign investors and, at the same time, reduces the transaction costs of such a mapping.

The question of whether or not the impact of foreign-owned firms can be differentiated by industry is a highly discussed issue. As highlighted by Hirschman (1977) and mentioned in the spillover literature, some industries have a larger linkage potential than others, that is, linkages are typically limited in process industries and high in industries where the production process is divisible into multi-stage activities using a variety of
materials, components and parts. Studies of technology spillovers, for example, find that benefits to local industry are fewer where capability and technology gaps between foreign and domestic firms are more pronounced and are more likely to occur where there are competitive pressures, but less likely when the competitive strength of the affiliate outweighs that of local competitors.

Existing empirical studies of inter-firm linkages fail to set their results in a consistent and comprehensive conceptual context. Each of these studies has solely focus on one aspect of local linkages, e.g. local sourcing strategy, local business and technology embeddedness, technology transfer to local suppliers. There is rather extensive literature on foreign-local linkages particularly in the development economics literature. However the focus is on backward linkages i.e. linkages to suppliers (e.g. Lall, 2002; UNCTAD, 2001). One reason is that the foreign firms’ customers are in less bargain power to control of whether or not to form linkages. More recently, forward linkages (i.e. linkages to distributors, sales agents and clients) are argued to have equally important effects on local firms in developing countries (Hansen and Schaumburg-Müller, 2006). The focus of previous research tends to be on the quantity, rather than the quality of local linkages, despite the latter being the critical issue for upgrading (Turok, 1993; Barrow and Hall, 1995; UNCTAD, 1999). Furthermore, existing literature has not adequately addressed the connection and interaction between these conceptual dimensions, for instance between technology transfer and local sourcing.

Most important insights of transfer via inter-firm linkages stem from the intra and inter-firm knowledge transfer literature which has identified many distinctive aspects of influential factors, including meso-level, inter-firm relationship factors, for instance organizational difference including legal, political, technical and cultural distance, knowledge connection, relationship openess, inter-partner trust, relationship quality and strength, relationship informality (for a review, see Sazali et. al., 2009). Studies also concluded strong influence of organizational context factors on knowledge transmission in external networks, for example, organizational structure, ownership type, ownership
equity, relational capital, goals and management commitment. However, none of these studies is included in the international business field.

A few empirical studies recently start focusing on identifying factors that influence the occurrence and the nature of technology transfer via local linkages. The first focus is relationship structural factors (e.g. Blomström and Kokko, 2003; Crespo and Fontoura, 2007). Two factors appear to be commonly accepted as potential determinants: the absorptive capacity, which proposes that only those domestic firms or industries in a host economy that possess sufficient technological knowledge and skills are able to absorb new technologies from foreign-owned firms; the extent to which FDI and domestic firms are located in geographic proximity. Less research investigating particularly MNE and subsidiary-specific factors, except a few studies on country of origin and foreign equity share in international joint ventures.

This research focus on developing country context, thus it is necessary to particularly look at significant studies of local linkages in developing economy including China. If looking specifically at linkages between MNEs and domestic firms in developing countries, it can be found that linkages have received some attention in recent years (for overviews, see Altenburg, 2000; de Velde, 2002; Hoskisson et. al., 2000; Lall, 2002; Görg and Grenaway, 2004; Hansen and Schaumburg-Müller, 2006). Most recent work on local linkage has been able to incorporate forward linkages into investigations of foreign subsidiary in the ASEAN economies for instance, in Malaysia, Singapore and Vietnam (e.g. Giroud and Mirza, 2006, Giroud, 2007; Iguchi, 2008). In these developing countries context, high levels of indigenous technological capabilities alongside foreign technology have facilitated rapid absorption of know-how and the generation of ownership advantages in indigenous enterprises (Dunning, 1981). China represents an important case in FDI research, not only because of the volume of FDI, but also because of its status as a typical developing country. However, comparing to the studied countries mentioned above, the Chinese industry has been subject to few researches on local linkages.
It was within various linkage issues that the present research in China by foreign subsidiaries was undertaken. However, there are several limitations of the current literature for our understanding of how the activities of foreign affiliates impact on domestic firms. One of the criticisms has been levelled at previous studies that treat FDI as a homogenous phenomenon, assessing overall impact on an industry or economy level, rather than differentiating between affiliate activities, types of foreign investment, and the unequal benefits that accrue to domestic firms at the micro or firm level (Girma et. al., 2004). Studies to date on the linkages and spillover effects of FDI in China for the most part also tend to ignore the possibility of diverse or divergent regional disparity and foreign firms from different source countries. Based on the insight from reviewed theories, these differences are capable of leading to different patterns of FDI and, by logical extension, to different patterns of local linkages and technology transfer. So far, searching in the comprehensive literature has spotted only several exceptions that linked country of origin effect to local linkages in China. Kotabe and Zhao (2002) investigated local sourcing types of foreign subsidiaries in China by linking them to a set of business and investment strategic factors. Child (2003) compared the intensity of local linkages established by Korean, U.S. and Hong Kong MNEs, finding that Korea subsidiaries had a weak tendency for linkage with local firms, whereas the US and Hong Kong firms showed a strong tendency for backward linkage with local firms in China. Salmi (2006) shed light on relationships between western subsidiaries and Chinese suppliers from aspect of supply chain management. Duanmu and Fai (2007) investigated the process of knowledge transfer of foreign subsidiaries to their Chinese suppliers.

2.3 FDI Impact and Inter-firm Linkages in the Host Country

FDI in many aspects has become the defining characteristics of the international business. FDI gives MNEs the controlling interest in foreign economy, which will encourage them to achieve their global objectives (OECD, 1992). Relationships with local firms may be critical to the enhancement of capabilities of both local economy and
MNEs. The local firm may help the foreign subsidiary with supply or marketing or development of technology, fostering the benefits of economies of scale, quality, prices and performance etc. From the host developing country perspective, the liberalization of trade and investment regimes create new growth opportunities, but it also exposes to tougher competition partly to access resources and markets, partly to fence off competition. However, it is believed that FDI can also play a pivotal role in indirect employment, industrial development and upgrading in host economy which in turn leads to further investment (Turok, 1993; Phelps, 1993). Development perspective literature has long recognized that the key to beneficial effects from FDI depend on whether or not foreign investors reach out to local industry through linkages. Through ‘linkages’ and ‘spillover’ knowledge and technology may be transferred more effectively to the host country and new opportunities for local firm development will transfer (Altenburg, 2000; Görg and Grenaway, 2002). Various systematic economics and FDI literature related to the impact of MNE provide a general frame to explain the interactions between FDI and economic development, which assign a central role to MNEs and their inter-firm linkages in the economic development.

2.3.1 Theoretical literature on the development effect of linkages

FDI is mostly seen as vehicle for increases in productivity and consequently as a driver for economic growth. Developing country governments therefore often provide investment incentives targeting foreign firms in an effort to attract FDI boost capital formation and enhance the quality of capital stock in their economies. FDI has impact in many aspects of the host economy, such as capital, technology, trade, industrial structure, employment (Dicken, 1992), comparative advantage, resource allocative efficiency, economies of scale and scope (Young et. al., 1994), infrastructure improvement (Kueh, 1992), and economic, institutional, and legal reforms (Zhan, 1993, Lardy, 1994, Porter, 1995). Various streams of development literature take macro- or micro-economic perspectives on the impact of MNEs and FDI in host countries. They provide the hints for the development effect of local linkages and the conditions under which these effects may occur.
The competitiveness literature

Porter’s diamond model (1990, 1998a) provides a structure for the country’s competitive advantage. Although the relationship between specific nature of the MNE and local development is not clearly analyzed, he actually mentions four country-specific determinants that interact with the nature of a country’s international competitiveness depending upon the type and quality of these interactions, including factor conditions, demand condition, firm strategy/structure and rivalry and related and supporting industries. Dunning (1994) commented that FDI may affect the configuration of the diamond. The diamond is useful when using locational advantages to explain the international production when these advantages are part of the MNE success in the host country, and when subsidiaries’ activities help to promote the technological and organizational efficiency of local firms (Davies and Ellis, 2000). Porter (1998a) has pointed out that the configuration of each activity embodies the way that the activity is performed, including human resources and physical assets and also associated organizational arrangements. In line with Porter, more scholars (Esser et. al., 1996; Dunning, 1992; Krugman, 1991; UNCTAD, 2000) argue that countries further put forward industrial factors, such as knowledge and technology based competition, industrial cluster, business alliances and long-term contractual arrangement, forms of government intervention.

In this context, inter-firm linkages in the form of the related and supporting industries and the suppliers appears as a key element on which MNE can have an impact on the host country competitiveness. Porter has long been stressing the importance of exploiting the linkages between value chain activities as a way of achieving sustainable competitive advantage. Linkages between MNEs and local industry in competitiveness literature may solve industrial restructuring challenges faced by developing countries, e.g. ineffectiveness of local firms and overwhelming orientation towards end-consumer markets in developing countries (Altenburg, 2000). Therefore, host countries need to improve conditions to attract advanced types of FDI and foster spillover through the local linkages. FDI spillover is externality that arises when the entry or presence of
foreign affiliates leads to improvements in the capability, productivity or efficiency of domestic firms (Blomström et. al., 2001). Moreover, it is argued that linkages between local cluster firms and foreign MNEs can be both destructive and facilitating for the local firms (Schmits, 2004; Giuliani et. al., 2005). Overall, this stream of literature provides a structure or the country’s competitive advantage and within this structure, supporting industries, particularly industry cluster is a key element on which MNE can have an impact, and has received growing attention (e.g. Gereffi, 1994; Rugman and D’ Cruz, 1996; Altenburg and Meyer-Stammer, 1999; Schmitz and Knorringa, 1999).

**Technological accumulation paradigm**

Another paradigm puts the emphasis on country and company technological accumulation (Pavitt, 1989; Cantwell, 1989) which means the level of technology is important at the level of the country as well as the level of the firm. MNEs expansion from developing countries or new emerging economies is schematized by sequential stages of the geographical diversification of the domestic firms’ activities. The nature of technological accumulation comes from the firm itself and it is cumulative and differentiated (Pavitt, 1988). As a new MNE, it concentrates on simple activities and less capitalistic manufacturing activities at the first stage. At the second stage, with accumulated experience in international production and industrial development in home country, the activities of the MNE spread towards other developing countries that are development. The later stage is characterized by sectoral distribution of more sophisticated manufacturing investments. And this stage takes place in countries with higher psychic and geographical distances. Overall, the rise in technological knowledge in the number of MNEs from developing countries is linked to the domestic industrial development, and to the accumulation through which firms create their own technological experience (Tolentino, 1993, 2000). The developing stage of a country could help to explain the impact of foreign firms on a host economy. This approach therefore links the firms’ competitiveness to domestic industrial development and technological accumulation within the firm. In the context of foreign-local linkage in host country, the last stage of development is linked with technological innovation,
hence the local technological capabilities including absorption capacity of local firms and technological development of the location.

In addition, a notable theoretical approach proposed by van Hoesel (1999) is related to this perspective. Adopting 'the late industrialization paradigm' (Hikino and Amsden, 1994), he emphasized that firms form the late industrialized economies (LIEs) have to grow without the competitive asset of a pioneering technology, so that 'learning from others' under strong support from government is the only input for their technological enhancement. Therefore, van Hoesel argues, the strategic focus for firms from the LIEs to compete with firms from the advance developed countries is possibilities on the shop-floor improving organizational skill and reducing learning cost and not exploitation of new technologies. His approach is helpful in characterizing the ownership advantage of FDI firms form the LIEs, which offers useful insight form this ownership study in this research.

**Stages of economic development**

There is a recognition that economic globalization, the importance of knowledge-based assets and the subsequent growth of alliance capitalism have not only fundamentally affected the way in which the assets and activities of MNEs are organized and undertaken, but also their impact on host economies (Cantwell and Narula, 2001; Dunning, 2001; Lundan and Hagedoom, 2001; Narula and Dunning, 2000; Teece, 1992). A widely used framework for looking at the relationships between inward FDI by MNEs, outward FDI by domestic firms and economic development by the host country is the Investment Development Path (IDP) (Dunning, 1981), which are further conducted at a macro- (e.g. Dunning and Narula, 1996) or meso-level (e.g. Ozawa, 1996).

The IDP suggests that a country may progress through five stages of economic development relative to the rest of the world (Dunning, 1981; 1986; Dunning and Narula, 1996). The central idea of the IDP is that foreign MNEs might help indigenous firms to upgrade their capabilities. It is firmly grounded at the micro or firm-specific level (Dunning, 1988). This framework implies that inter-firm linkages influence the OLI
configuration of a host economy and the subsequent progression through the stages of the IDP (Scott-Kennel and Enderwick, 2005). Ozawa (1992, 1995, and 1996) put forward an alternative conceptualization of the relationship, called the ‘stages theory of international upgrading and overseas investment’ categorizes countries by four sequential stages of industrialization. Here two of the most important underlying mechanisms that explains shift from one stage to another is factor incongruity, which is defined as the incompatibility that appears overt time between the factor intensity of a good and the factor endowments of an economy in which the good is produced. However, Ozawa’s framework draws largely form the Japanese experience and take example industries each stage from the history of industrialization in Japan. The framework’s heavy reliance on the experience of a single country implies that other countries specific element might not adequately be taken into account to use this model in a general way.

FD literature on resource transfer and spillover effect

From the firm perspective, FDI literature addresses the development impact of MNEs through inter-firm linkages. Local firms in host country can be benefited from FDI through directly and indirectly mechanisms in order to become more productive and internationally competitive (Halpern and Muraközy, 2005; Günther, 2005; Crespo and Fontoura, 2007; Navarette and Venables, 2004; Narula and Zanfei, 2005; Castellani and Zanfei, 2006). The distinction between them is important in this research as different level of analysis and objects of analysis.

MNEs can generate direct effect through local linkages, by providing local firms with financial resources, technology, know-how and access to foreign markets, for instance. MNEs are widely considered as crucial actors in knowledge transfer to local firms, especially when Less Developed Countries (LDCs) are considered as recipient economies. A resource-based definition of MNE is that MNE is ‘a major vehicle for the transfer of mobile resources (technology, capital, management skills) to areas with immobile or fixed complementary inputs (markets, raw materials, labour) (Buckley and Casson, 1985). FDI could be a proactive effort of MNE to recombine resources and
rearrange activities through their external relationships (Hakansson, 1992), while the external relationships adopted by subsidiary are closely associated with inter-firm transfer of knowledge and skills. FDI is thus considered as a source of modern technology, in a broad sense, including product, process and distribution expertise, as well as management and marketing skills (Blomstrom and Kokko, 1998).

Scholars have recognized the significance of backward linkages, arguing that foreign-owned firms can impact on supplier industries through the physical quantities they purchase, and through purchasing materials, components, and services, with local firms (e.g., Dicken, 1992; Kueh, 1992; Young et. al., 1994; Williams, 1996; UNCTAD, 2001). Local suppliers gain more than the pecuniary benefits of selling their products to MNEs, they can also benefit from the inter-firm exchange of technological and managerial knowledge (Giroud, 2007). The technology or knowledge resources include quality standards and efficiency of production, as well as providing assistance and resources relating to procurement, design, quality control, training, or market information (Lall, 1980; Driffield et. al., 2002). Foreign subsidiaries may contribute these direct transfer to raise the capabilities of local suppliers, improve the quality of goods or for the introduction of innovations, create productive infrastructures and for the acquisition of raw materials, serve export-oriented firms on a more even footing with importers, as well as support at the organizational and management levels, among other aspects. Regarding to other types of local linkages, sourcing from foreign suppliers in upstream industries can generate forward transfer of knowledge and skill resources as MNEs’ supply of a higher quality inputs or at a lower price to domestic producers (Markusen and Venables, 1999). Moreover, local customers would have an expanded choice of input and technology, and local collaborator would obtain capital support to complete a project.

The direct mechanism of FDI spillover is created as a result of direct relationships between MNEs and local firms, notably voluntary or direct resource transfer through vertical linkages (Blomström et. al., 2000). It could induce improvement in quality and efficiency of local firms, such as in the case of suppliers, by creating demands to attain
economies of scale and providing access to advanced resources (Saliola and Zanfei, 2009). Voluntary resource transfer in some cases is formed as relational specification in the contractual agreements between linkage partners. Based on the technology transfer mechanism theory, technology sharing offers more opportunities than other channels (Young, 1988). The extent of collaboration can be taken as an indication of a long-term commitment to the host country and local innovation system. Foreign firms' local collaboration, particularly R&D collaboration is likely to involve significant technology transfer, an upgrading of employees' technical skills and positive effect on local innovation capabilities (Archibugi and Michie, 1997; Reddy, 2000; UNCTAD, 2005). MNEs' linkages to public research infrastructure and universities can enrich the local innovation systems and improve the innovation capability of host region (Reddy, 2000; Asheim and Coenen, 2006).

Other than direct assistance or employees training to local firms via inter-firm linkages, there may also be unintended 'spillover' effect of FDI which occurs strictly through indirect mechanisms including demonstration effects on local firms, enterprise spin-offs, competition effects and mobility of trained employees (Baptista, 1998; Moran, 2001; Saggi, 2002). A MNE in a given sector is often associated with direct transfer of superior technical and managerial know-how, better organizational practices, etc., that not only improves the productivity of firms that are recipients of FDI, but also spills over into the surrounding economy through worker turnover and/or demonstration effects ((Driffield, 2001; Damijan et. al., 2003; Vahter, 2004).

Many of existing FDI literature used inconsistently the terminology regarding spillover and linkages. While 'linkages' is the potential for development, the 'spillover' is the actual development effect. Giroud and Scott-Kennel (2006) argued that linkages can be differentiated from other spillover mechanism due to the direct influence of the foreign subsidiary on the local firms' capability. Linkages are clearly the relationships established by the foreign firms with local firms, whereas spillovers are the spin-offs that may result after the linkages have taken place. Dunning asserts that spillovers arise as a direct consequence of the linkage forged between foreign investors and other
economic agents in the countries in which they operate (Dunning, 1993a). Local firms have the opportunity to benefit from transfers and diffusion of knowledge embodied in products, processes and technologies of the MNE (Driffield et. al., 2002). Nevertheless, if local firms do not have the capacity to benefit from this upgrade of quality, they will suffer the negative effects associated with increased costs (Javorcik, 2004). In another word, spillovers outcomes arise from these linkages only if local firms are capable to absorb, adapt and replicate the knowledge and technology transferred. Wong (1991) in his study claimed that indirect spillover through linkages are more important than the direct forms of inter-firm technology transfer, including training local suppliers’ employees, giving advice or assistance on quality control or management practices, performing plant audits and troubleshooting some production problems, or loaning equipment. However, many research (e.g. Dunning, 1993a; Dunning and Narula, 1996; Capannelli, 1997; Techakanont, 2002) confirmed that there is significant evidence for that local parts suppliers have improved their technological capabilities owing to direct transfer via inter-firm relationships or linkages.

2.3.2 Empirical research on the consequences of inter-firm linkages

There is longer history of research on the consequences, than the causes of inter-firm linkages. The consequences of local linkages is becoming closely intertwined with research streams on determinants of local linkages, as considerable empirical researches have come down to the influential factors with respect to their impact on local linkages.

The impact of MNEs on host economies has been studied carefully in the literature since the 1960s. Many studies in different contexts of host economies using different methods showed mixed and inconclusive results of both positive and negative spillovers (e.g. Günther, 2005, Blomström and Kokko, 1998; Görg and Strobl, 2001). Positive evidence of MNEs’ technology transfer to through supply chains is documented in a few case studies (e.g. MacDuffie and Helper, 1999; Rasiah, 2003; Blalock, 2001; Schoors and van der Tol, 2001). However, there is no conclusive evidence emerges regarding to whether MNEs contribute more or less to linkage creation and innovatory activities in host
countries (Bjorvatn and Eckel, 2005; Görg and Greenaway, 2003). On one hand, these studies emphasize that inter-firm linkages are key mechanisms through which technology, knowledge, and market access opportunities are transferred from foreign firms to local firm, and that strong linkages ensure that foreign investors are better grounded in the local economy (Altenburg, 2000; UNCTAD, 2001; Dicken, 2003; Scott-Kennel and Enderwick, 2005). On the other hand, the literature also recognizes the limitations to linkage-based development, including the limited upgrading opportunities for developing country linkage partners in global value chains and the subsequent danger of 'lock-in' in low value added functions (Humphrey and Schmitz, 2001; Wad, 2006; Gereffi et. al., 2005). Moreover, there are hardly any empirical studies analyzing explicitly the relationship between linkages and spillovers (Blomström et. al., 2000), except Javorcik (2004) found that relationships and linkages created by foreign firms do not necessarily lead to an increase in the productivity of local suppliers.

Research on linkages and spillovers has been centred on both large, developed economies or regions (e.g. Dunning, 1998a; Cantwell and Piscitello, 2002; Sambharya and Banerji, 2006), and developing or transitional countries (e.g. Blomström, 1989; Grosse, 1988; Svetlicic and Rozec, 1994; Kokko et. al., 1996; Sun, 1996; Khawar, 1997; Figueroa, 1998; Aitken and Harrison, 1999; Lall, 2001; Narula and Sadowski, 2002; Giroud, 2003). However, there are not conclusive results on linkage effect in developing countries or developed countries.

In the existing studies, backward linkages with suppliers are seen as one of most important channels through which superior know-how and technologies can spill over to the host economy. The positive externalities arising from linkages have been found to be higher in the case of vertical linkages as opposed to horizontal linkages (Alfaro and Rodríguez-Clare, 2004). Vertical linkages can promote economic development (Lall, 1996; Glass et. al., 2002; Moran et. al., 2005; Scott-Kennel and Enderwick, 2005; Hoekman and Javorcik, 2006; Kugler, 2006), particularly in transition economies exhibiting high participation of MNEs in the economic activity (Holland et. al., 2000; Campos and Kinoshita, 2002; Ngoc and Ramstetter, 2004; Uhlenbruck, 2004; Günther,
A few theoretical works also suggest that the presence of deep backward linkages is critical to assure that the productivity improvement stemming from FDI materializes in industrializing nations (Rodriguez-Clare, 1996; Rodrik, 1996; Markusen and Venables, 1999). Sun (1996) in his study of China, finds FDI tends to be concentrated in industries that have high backward, but not forward linkage indices. As a result, their relative importance is still unclear. When MNE affiliates procure production inputs through local enterprises, they are generally interested in keeping their quality standards. As a result, they provide technical equipment and assistance, market information, product specification and management training to local suppliers, in order to help them meeting the quality standards of their output. Comparatively, forward linkages with customers and agents are addressed less frequently in empirical research, except a few notable studies (e.g. Dunning, 1998a; Driffield et. al., 2002; Girma et. al., 2004) found the importance of forward linkages in spillover effects. For example, Driffield et. al. (2002) found evidence of positive spillovers through forward linkages in UK manufacturing industries, but only weak evidence of externalities from backward linkages. Girma et. al. (2004) find domestic firms in the UK only benefit from forward linkages with domestic market-oriented MNEs-suggesting that MNE inputs used by domestic firms result in productivity spillovers. Moreover, few studies, except Scott-Kennel and Enderwick (2004) for example, argues for the inclusion of horizontal and alliance relationships in linkage research, citing their contribution to organisational learning and development. Overemphasis on backward linkages restricts understanding of the nature of other linkages, and impedes comparison of the relative value of linkages in different region contexts. But this emphasis may be attributed to a focus on developing countries and manufacturing industries, where horizontal linkages and forward linkages are less common or less important.
2.4 Theoretical Synthesis for the Empirical Investigation

After reviewing over the existing literature, it is able to move toward a theoretical understanding of linkages that integrates insights of these theories, and this section finally conceptualise with the identification of a theoretical framework in the extant literature which addresses the link between the influencing factors of local linkages. Drawing upon vast literature, it is argued in this research that the local linkages formation of firms is explained by simultaneously examining both internal and external factors of MNEs.

2.4.1 Theoretical and empirical integration

It is evident that linkages between foreign investors and local firms are receiving growing attention both in the development economic and international business literature. Table 2.4 below summarises theories and concepts in order to further elaborate implications for analyzing inter-firm linkages. The core theories have the multitude of aspects associated with foreign-local inter-firm relationships. They obviously pertain to different components of the relationships and to different levels of analysis including for instance, outcome, shapes or governance of local linkages. However, they are not contradicted, but complement each other very well, in that the weaknesses of one are mostly mitigated by the strengths of one of the others. The heterogeneous nature of this research is that it is difficult to follow a single theoretical stream.

<table>
<thead>
<tr>
<th>Theoretical stream</th>
<th>Key concepts and idea</th>
<th>Implications for determinants of IFLs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource based view</td>
<td>MNE in their search for competitive advantage generate, sustain and develop resources and capabilities through inter-firm linkages</td>
<td>Internal/External factors of MNE subsidiary</td>
</tr>
<tr>
<td>Transaction cost economics</td>
<td>Local linkages is in-between arrangement between market exchange and hierarchy led by transaction characteristics</td>
<td>Industry—maturity influence network of relations, Time—learning curve and adjustment</td>
</tr>
</tbody>
</table>
Basic concepts in the various strands of theories above can imply that inter-firm linkages between MNEs and local firms are motivated by possible reasons: local linkages reduce transaction cost compared to market transaction; linkage may help firms leverage resources and bridge resource gaps, network collaboration is crucial to a firm’s growth and competitiveness.

Both the international business and development literature provide implications for the antecedents of inter-firm linkages, which is that linkages and their developmental benefits tend to be related to internal and external factors of the relationship members. Comparing with the TCE, the RBV is less efficiency considerations and more a result of firm’s search for competitive advantage. The RBV complements the TCE theory, noting the local linkages motive is to access valuable resource of both foreign and local firms, as well as the possible resource flow outside of traditional market transactions. It is also suggested that the competitiveness theory is industry based and external orientated while the RBV is firm specific and concerns internal aspects of the firm. The RBV may also extend beyond the internal domain of the firm to
examine the external resources factor and the protection of resources against substitution and imitation by other firms. The argument above indicates that the MNE facing to or not to enter a network in host country and what degree to be involved, internal and external resources will decide and influence managers' perceptions which lead to the final choice. MNEs deliberately enter the host country on the basis of their own or partners' strategic considerations, and at the same time develop close relationships with local firms at the subsidiary level on the basis of resource demanding which grew out of the subsidiary' possession. External networks including local firms in the host country therefore become the source of valuable resources. Resource availability of the local networks potentially predicates the role of locational factors in fostering inter-firm relationships. Foreign subsidiary is the unit of analysis in this research, and its specific place and role within the MNE network needs to be considered because it undoubtedly influences the type of activities the foreign affiliate conducts within host economies and affects the development potential of local linkages.

Network perspectives share with RBV and TCE the awareness that exchanges are at the core of all business transactions and MNEs are resource dependent in the fulfillment of their underlying objectives, which imply that host economy circumstances including the concepts of uncertainty and complexity may influence inter-firm relationships building of the subsidiary. The context of asset specificity and uncertainty differs across industry, and may lead to different level of inter-firm relationships, for example, the difference between integrated and less integrated industries. Moreover, TCE and network approaches share an interest in vertical integration and opportunism. But the difference is the network perspective stresses the partners engage in multiple and repetitive exchanges over the duration of their relationships (Ford et. al., 1997), while TCE describe arm-length exchanges. However, focus of this research is the in-between forms of relationship which often lead to information exchange between firms beyond discrete market exchanges stressed in TCE. Although criticized for the weakness in the relationship governance perspective, TCE can explain transactional exchange or 'non-relational' exchange governance between foreign subsidiary and local firms and is therefore a good supplement to
network approaches. The network approaches reversely help to understand the mechanism through which the foreign subsidiary creates an external network in the host country. The strength of the network approach is also to grasp the 'interaction' nature between local network partners which implies that the location or country specific factors may actually contribute to the long-run development of foreign subsidiaries' local networks. This 'interaction' is also a time oriented indicating possibly different level of embeddedness and complexity in foreign-local firm relationships. The firms need to decide on its efficient boundary which can be adjusted over time as the firm gain experience, as asset specificity decreases and marketing contracting increases. Network-oriented theories particularly global value chain approach may explain the outcomes of foreign-local relationships, which are the knowledge and skill transfer to local firms.

Theories related to the development effect of FDI are tackling uniquely international aspects of the interaction between the activities of the MNE in a host country with the development process. In the specific study of inter-firm relationships between MNEs' subsidiaries in host countries with their local firms, the development perspectives presented are useful to grasp the image of the mechanism of the development process. The development perspectives consider local linkages as engines of developments and conceive linkages as essential ingredients in strategies to restructure national economies and improve national competitiveness. The concepts of linkages, technology transfer and spillover at the national and firm levels, as well as the concepts of growth linking with FDI are able to provide the basis of the impact of MNE on host economies through local linkages. These theories reveal some social and environmental dimensions that are essential to the long-term impact of FDI on host country, such as industry cluster and local firms' absorptive capacity. The aspects of host countries and home countries such as development stage, technology and industry conditions that influenced by FDI will intervene on linkage formulation and knowledge transfer between foreign and local firms. However, the development economic literature tends to operate with some very rudimentary conceptions of firm and host government motivations for linkages which essentially ignore insights obtained by the international business literature. What remains unanswered in development perspectives are why firms prefer local linkages to
hierarchies and market; how linkages are organized and governed; how technological bonds emerge in external networks; what and how much technological resource is included within these bonds or transfers.

In addition to the reviewed literature above, many other theoretical ideas argued that inter-firm linkages are not only firm specific, but also location specific. As a broad consensus of economists, the role of knowledge and inter-firm relationships in determining economic growth incorporates geographic perspectives, as geography is recognized as a key influence on the structure and intensity of inter-firm linkages, use and diffusion of knowledge (McDougall and O’Connor, 2005). Economic geographers have shown that location is a powerful influence on the propensity of firms to interact and may greatly facilitate the processes of interaction and collective learning between firms (Scott, 1998; Keeble and Wilkinson, 2000). Organizational sociologists also have typically viewed network formation as driven by exogenous factors, such as the distribution of technological resources or the social structure of resource dependence (Burt, 1983). From these views, external linkages could be influenced by economic incentives or constraints which largely derived from the diversity, uncertainty, and complexity of the contextual environment.

Although under differentiated theoretical strands, antecedent and consequence of inter-firm linkages consistently come with related phenomena, and the distinction between these two perspectives becomes blurred. International business literature explaining linkage formation can furthermore contribute to the linkage effect. TCE and RBV inspired conceptions of the effects of FDI as welfare enhancing, and on the other hand market power theory inspired conceptions of FDI as welfare reducing (Forsgren, 2002). From the RBV perspective, FDI is not a result of market failure as a result of the MNE’s need to transfer and access resources that key to its competitiveness (Barney et. al., 2001; Teece, 1998). The eclectic paradigm is relevant to MNEs’ decisions on the choice of internalization and external relationship creation, and meanwhile, extended applications by many scholars explain the behaviour and the exact process through which MNE initiate investment and impact on the technological capabilities of local firms and
economy. FDI and development literature bridges the link between MNEs and host economy development and these theories and literature induces complementary elements for analysing conditions where MNE linkages influence on.

Review on the empirical studies recognizes the general limitations in local linkages research. One aspect that still needs better understanding is the way foreign firms influence the development of local firms, notably through their local purchasing behaviour (Moran, 2005). Current FDI research in terms of linkage is mostly interest in the developmental consequences of local linkages, and emphases the welfare implications of MNE transactions. Relatively fewer studies have examined the factors explaining the level of local linkage by MNEs in host economies, and even fewer have focused specifically on technology transfer to local firms. Research to FDI spillovers has focused on vertical rather than horizontal linkages. Evidence showed that spillover is most likely to take place through backward linkages, which are contacts between local suppliers of intermediate inputs and their foreign clients. Emphasis by researchers on spillover at a macro level fails to adequately consider the mechanisms for foreign subsidiary-local firm spillover that occur at the micro or firm level i.e. linkages. As Görg and Strobl (2001) stated, 'the approach adopted in the empirical literature largely avoids the question as to how productivity spillover take place, but focuses on the simpler issue of whether the presence of MNEs affects productivity in domestic firms. A focus on changes to domestic productivity or output as a result of the presence of FDI, obscures the mechanisms or interactions at the firm or micro-level that give rise to these improvements (De Mello, 1997).

Above all, the synthesis of the theoretical and empirical literature implies that the existence and degree of FDI impact on the industry and firms in the host country, which could be influenced by the various natures of MNEs and local conditions in the host economy. Moreover, practically, in order to choose appropriate government intervention on linkage creation. In another word, it is essential to grasp the characteristics including the development potential of MNEs' local linkages, as well as the factors affect these characteristics.
2.4.2 Theoretical framework

Drawing on the concepts and theoretical perspectives, three themes of efficiency, dependence and structure could be extracted as a foundation for the framework. Following this logic, the framework for the analysis of inter-firm linkages between MNE subsidiaries and local firms can be concluded in the diagram below (Figure 2.5).

Sets of determinants are raised and integrated in a theoretical framework as a basis for the analysis of MNE, their inter-firm linkages, and their potential impact in host countries. Overall, MNEs' inter-firm linkages are conditioned by three interacting drivers: firm-specific factors of both MNE and local firms that determine their motives, capability and strategies in the conduct of inter-firm linkages; country-specific factors including macro-, micro- environment factors reflecting the cost, structure, availability in the home and host market. This research focuses on factors found debatable and deficient in previous research, including firm-specific factors: MNE subsidiary' ownership mode and age; country of origin to represent the expected difference among home markets; cost, technological capability, industry agglomeration and government role in the regional market in China. These factors present heterogeneous resources and environment can affect MNEs' necessity and opportunities to form inter-firm linkages and subsequently affect the outcomes in local linkages, i.e. resource transfer to local firms and local collaboration propensity. The rest of this section will discuss the expected influences of these factors.

Figure 2.5 Theoretical Framework for analyzing inter-firm linkages
Earlier conceptual discussion highlighted the key constituents of inter-firm linkages are not only transaction relationships, but also long-term oriented collaboration and resource transfer via these relationships. While methodology, terminology and research focus vary, the general consensus in the literature is that linkages can make an important contribution to domestic firms' technical, managerial and organisation capabilities (Dunning 1993, UNCTAD 2001). The mechanisms through which such development consequences occur at the firm level are the linkages that form between foreign and local firms, where the resources exchange is generated. Therefore, local linkages are termed multidimensional since it reflects a multi-effect on local firms: inter-firm transactions, interactions and on-going relationships which are direct mechanisms of impact on production and profitability; and enclosed knowledge and skill transfer to local firms via these relationships.

Consequently, three variables to indicate both quantity and quality outcomes of inter-linkages between MNE subsidiaries and local firms are chosen by considering of applicable, not repeated, and predictable for development impact on host country. They
are: MNE subsidiaries' strategic orientation of sourcing and sale, as well as strategic outcomes in terms of local collaboration and resource transfer to local firms. The basic idea behind the selection of the three variables is that in local linkages, level of local sourcing and sale, degree of resource transfer, as well as the intensity of local collaboration in host country represents the conditions under which potential of development effect could be maximized. Recent research acknowledges that the extent of their interaction with local firms and knowledge creation and accumulation within foreign subsidiaries influence the extent of productivity spillovers to domestic firms (Marin and Bell, 2006). However, development potential (Giroud and Scott-Kennel, 2009) is emphasized and differentiated from the actual development effect because the linkages as the direct mechanism do not, in all instances, act as a conducive means for firm development, and nor does transfer of resources necessarily imply development (Ambos et. al., 2006).

The first characteristic of IFLs is the extent to which foreign subsidiaries supply and sell, the quantity of local sourcing and sale which describes the strategic orientation of MNE subsidiary toward input and output markets, which describes. MNEs have flexibility to decide the level of internalization when investing in host country, and the subsidiary firm decides between establishing linkages with local businesses or bound in intra-firm networks. Their sourcing and sale in host markets provide enhanced market opportunities and result in the context in which higher linkages effect may occur. This indicator is derived from the general notions in the literature to predicate potential linkages intensity between firms.

It is not only the supply chain relationships, but also the collaborative relationships and non-pecuniary resources conveyed from the MNEs to local network partners that act as a catalyst for changes in the host economy in the long run. From this respect, creation of MNEs' local collaboration and resource transfer to local firms are concluded as the quality outcomes in local linkages. As these types of linkages particularly collaborative linkages reflect different mechanisms and control patterns, this research is taking a closer look at their individual type. More specifically, MNEs' subsidiaries establish
collaborative relationships with various economic agents to accomplish various projects including marketing, production, management and innovation. Comparing with vertical relationships, collaboration agreements comprising substantial inter-firm learning and joint development of resources can help the local firms to upgrade capabilities or technology more directly and significantly. However, FDI cannot automatically generate this type of linkages and that MNEs must be embedded in the local economy in order to facilitate lasting and sustainable collaboration with local firms.

The third characteristic is the degree of resources transfer from the foreign subsidiary to a local supplier or customer which is described as the non-pecuniary benefits gained in the vertical linkages. In order to facilitate inter-firm resource transfer particularly knowledge and skills, foreign subsidiaries and local firms are expected not only to establish close transaction relationships between them but also develop quality exchange relationships. During the course of relationship developing, the foreign and local firms engage in mutual beneficial exchanges. In particular, the beneficial impacts of linkages are highest when appropriate inter-firm knowledge and technology exchanges take place because subsequent application of those resources by local firms has the potential to strengthen the capabilities of host country industry and economy.

2.4.3 The factors affecting inter-firm linkages

This section will establish the expectations on the causal relationships illustrated in the theoretical framework.

**Industry sector and Subsidiary Size**

The role of industry on local linkages has been clarified in theories and existing studies concluded above with the most consistency. The size of firm have been found with contradict results, however due to the anticipated low respondent rate, this research need to reduce the number of independent variables and therefore, will focus on the same industry sector and size band of the foreign subsidiary in consideration of the difficulty with sample size, and of reducing the negative effect of a large number of independent variables number.
The potential for linkages is obviously, not the same for all industries, the sectors or sub-sectors. In services, the possibility of local sourcing and subcontracting to domestic firms is relatively limited, although some service industries such as construction offer considerable potential for linkages with physical input suppliers (UNCTAD, 2001). In the manufacturing sector, there will be important differences according to the labour-, capital-, resource- or technology-intensity of the sub-sector, for instance, resource-intensive industries (e.g. food, petroleum refining) will have a higher share of local sourcing. Labour intensive industries (e.g. textiles, metal product) will most likely demonstrate a lower percentage of local sourcing. Specialized supplier industries, such as non-electrical and electrical machinery, communication equipment and semiconductors, will have the lowest local sourcing. Industry sectors such as chemicals and pharmaceuticals are both capital-intensive and R&D or science-based which demonstrate an intermediate level of local sourcing. Chinese industrial policy is also bound to have affected sourcing patterns.

FDI impact may depend on the type of industry in the host country, but also the level of technological knowledge in the host economy determines the degree to which technology may be assimilated. Depending on which industry is concerned, MNE show various levels of technological knowledge and the interaction with local firms may be affected by this level technology and the interaction with them may be affected by this level of technology. Depending on which industry is concerned, MNE show various levels of knowledge, and the interaction with local firms may be influenced by this level of technology. The process of mechanism through which MNEs impact on the development of local firms and industry is not explained by this stream of theories. The contribution however is the concept of technology at the national and firm levels, and the link with FDI is to provide the basis of the analysis of MNE's impact on host economies through local linkages. The type of industry clearly contributes to the diversity of external transaction relations created by the firm because of the condition of specific industry, the production and product nature. Following the transaction cost theory, in less mature industries such as petrochemical industry in China, there is a
decreased use of subcontractors or cooperative agreements. In the stages of growth approach, the level of technology embodied in the industry may determine the relationship between FDI and the type of technology spillover thus the level of economic development. Additionally, the demand and production decided that in high-capital investment of petrochemical industry with large-scale of single transaction, there is limited number of external business partners than in other industries e.g. electronic and textile. In addition, many of these influences are industry-specific. For example, mineral resources are required for mining industries, labour costs are more important for labour-intensive industries than for capital-intensive industries, and distance to markets is important for consumer tradable goods (Lipsey, 1999). According to these reasons, this research is controlled in petrochemical industry alone, in order to investigate other factors which are not clear and more contradictable.

Some studies have indicated that the size of the foreign affiliate may affect sourcing and linkages. Large MNEs have been found to source fewer inputs locally than smaller ones (UNCTAD, 2001), as large foreign affiliates are able to internalize operations better, i.e., they will produce relatively more within their own plants, and local suppliers find it difficult to supply very large volumes, size might be negatively correlated to local sourcing (Barkley and Mcnamara, 1994). Hence while large affiliates might be less beneficial to the host country by purchasing less because they can easily produce inputs internally, especially intermediate inputs embodying firm-specific and proprietary technology. Third-party connections are therefore particularly important for small and weak firms that normally lack the capability to go it alone in internationalization (Shaver and Flyer, 2000). Few studies found that large firms are shown to establish stronger local ties than small firms. Chen et. al. (2004) find that large firms are more active than small firms in pursuing local linkages and argue that their larger capacity implies that they are more able to absorb risks involved in supplier integration. Major differences in local linkages between large and small firms manifest themselves primarily in local sourcing of components and parts, subcontracting, joint R&D efforts with local firms, and utilisation of local financial resources. Large firms also have more capacity to absorb the risks involved in building new relationships, whereas small investors have
less autonomy in local networking because of the heavy reliance on their partners in the primary relationship. It is also can be explained that large firms are more likely than small firms to be self-motivated to undertake FDI and to execute investment projects independently; small firms are more likely to depend on partners with prior trading relationships, and on overseas Chinese as third-party connections in the undertaking of FDI. Other studies found no significant relationship (e.g. Giroud and Mirza, 2006).

**Ownership mode of foreign subsidiary**

MNEs can enter host countries through export, joint ventures (JVs), wholly owned subsidiaries (WOSs), arm-length arrangements, or combinations of these. Being the intermediate form between markets and hierarchies, the broad concept of network can account for almost any relation between firm including formal arrangements such as and supply chains or supply webs, alliances and joint ventures. Among these modes, export, subcontracting, licensing and franchising without MNE presence in the host country can be assumed that direct linkages and spillover effects are minimal. Hence, this research focuses on the equity-based mode of MNE subsidiary in the host country. The most popular institutional arrangement of FDI in China’s petrochemical industry is Sino-foreign joint venture and foreign wholly owned subsidiaries. The reasons for setting up a joint venture or a wholly owned subsidiary are multiple and diverse, including control, commitment, finance and risk (Hill et. al., 1990). The choice of entry mode is associated with the conceived plan of investment in local relationships prior to undertaking FDI, because those investors that intend to spend more resources on building local relationships are more likely to choose a joint venture over a wholly owned subsidiary. In this aspect, a joint venture is preferable to a wholly owned subsidiary if the investor intends to make use of local ties in accessing local networks, because local partners can serve as an interface to local networks. The differences between JV and WOS in turn may have strong implications for the cost of capital, the level of investment, sourcing strategies, the degree of technology transfer, integration of the MNE’s global activities and ultimately its performance.
Transaction cost consideration can cause foreign investors to claim less share in their overseas subsidiaries and externalization of business transactions when confront with more barriers and risks in the host country. The wholly owned enterprises mean that investors establish subsidiaries in Chinese market, for example, and retain 100 percent control without any contribution from Chinese partner (Tung and Cho, 2000). The MNE opts for a JV subsidiary to reduce setup cost and risk problem which can be alleviated if the MNE and an indigenous firm in host country form a joint venture. JV is more likely to externalize transactions for this aim through local ties, and the costs of achieving local linkages are reduced when the foreign investor has a local partner who may provide additional returns, local knowledge, distributional networks and facilitation (Madhok, 1997). Local partners provide information and play an intermediary role in relationship building, and lower costs lead to more investment. Due to the liability of foreignness (Zaheer, 1995) faced by foreign affiliates, and their lack of familiarity with the environment and local norms, there is likely to be variation related to ownership in communication capabilities of firms within a local network. This would diminish the ability of foreign affiliates to create local linkages. Specifically, a Chinese partner company will have a better knowledge of the local industry and market place, which will result in a significant impact on the degree of local sourcing. As compared with WOS, lower import propensities are anticipated in subsidiaries established through JVs, at least in the early years of operation. The explanation lies in the local sourcing patterns established by the indigenous company (Andersson et. al., 1996; Blomström et. al., 2000). However, if existing linkages are inefficient, acquired firms or joint ventures may switch to foreign suppliers (UNCTAD, 2001). A similar rational applies to the sale orientation. Many JVs are established to utilize the existing marketing channel and customer base of the local partner in the host market. However, market orientation is also strongly related to the product competence and demand in respective market.

TCE theory can also explain that MNEs with globally integrated strategies may be relatively inclined to opt for high levels of internalization as under-performing local linkage. Parent MNEs aiming to ensure forming the integral part of value chain and their close coordination prefer high equity control over their subsidiaries (Dunning, 1994). To
overcome market failure and the subsequent cost of failure, MNEs favour internalization of its activities across borders. Dicken (2003) argues that MNEs that are strongly vertically integrated on a global scale are less likely to develop local supply linkages than firms with a lower degree of corporate integration. Since greater and more intensive linkages are expected when foreign subsidiaries perform strategic activities, it is likely that the positive impact of foreign affiliates in China will increase when these affiliates gain enhanced positions and strategic influence within the MNE network (Giroud and Mirza, 2006). Furthermore, a MNE's equity share represents the degree to which the parent MNE exercises control over its subsidiary's activities and protect the integration of the MNE's assets (Grossman and Hart, 1986). These imply that the degree of subsidiary autonomy will affect the level of initiative to establish local linkages. The greater the autonomy exercised by the affiliate, the more likely it is to try and identify local suppliers and creates relationships with them (UNCTAD, 2001; Eberhardt et. al., 2004) and a wider range of local inputs creatively (Cantwell and Iguchi, 2005).

Comparing with WQS, a JV subsidiary who are allowed higher degree of autonomy in key areas as the choice of markets and technologies is likely to exploit static and dynamic economies of scales in host country, expand their sales and experience a wider range of local activities.

JVs are viewed as a viable vehicle technology transfer from MNEs to local companies, and such knowledge transfer can contribute to the performance improvement of local companies (Lyles and Salk, 1996; Hobday, 1995; Lane et. al., 2001). Particularly in the context of developing countries, MNEs often bring to the JVs valuable firm specific advantages such as sophisticated technology, manufacturing skills, and managerial expertise (Luo, 2002; Yan and Gray, 1994). Furthermore, JVs only tend to create more linkages with local enterprises, but also allow reciprocal exchange of information facilitating the adaptation of technologies, management and production techniques to host country conditions. Furthermore, the RBV theory implies that large-block foreign investors may provide local firms the access to resources required for restructuring and development of international activities. In particular, strategic foreign investors with large equity stakes have an incentive to provide portfolio firms with access to their
contractual networks and resources (Filatotchev, et. al., 1996; Pohl et. al., 1997). Therefore, in China’s petrochemical industry, foreign investors with substantial equity stakes play important governance and resource roles, and their presence should be positively associated with linkage and intensity of resource transfer.

Although technology and management skills from foreign partners seem to play a dominant role in a JV relationship, local participation, contribution and collaboration are also essential in the success of a joint venture. Different to WOS, JV is involved in both equity and nonequity linkages with indigenous firms of host countries. According to Madhok (1996) which was reviewed that JV is one type of collaborative linkages that differentiate the other linkages external to foreign firms. Therefore, joint ventures will have larger upgrading effects than wholly owned subsidiaries, as the local joint venture partner will acquire technology and knowledge from close interaction with the MNE.

However, the evidence for the impact of partial ownership on technology transfer seems conflicting. Entry mode selection of the foreign subsidiary corresponds to the incentives of the MNE to apply their resources to the establishment of subsidiary and to the local relationships (Javorcik and Spatareanu, 2003; Javorcik, 2004). Technology transfer from the foreign parent contributes to the competitive position of the affiliate in the host economy, but may reduce the willingness of affiliates to engage in direct linkages for fear of losing proprietary advantages (UNCTAD, 2001). The intensity in R&D is negatively correlated with the probability of entry through JV and positively correlated with the probability of entry through WOS (Smarzynska, 1999) because local spillover will reduce the MNEs' incentives to invest in technology used in the partially owned subsidiary. MNEs establish WOS when they have abundant resources, an ambitious business vision, a technology orientation, or to avoid leaking their technologies to others. Companies with limited resources tend to invest in host countries through partnerships because they need to share the investment risk, or are constrained by the policies of the host countries. When MNEs enter the host country through joint ventures, they will be reticent to transfer state-of-the-art technology to their affiliates in order to prevent its leakage in the host economy (Ethier and Markusen, 1996). Reversely speaking, when
MNEs introduce their state-of-art technologies to host countries they prefer full control over their manufacturing subsidiary in order to protect their know-how. Mansfield and Romeo (1980) found that, on average, the technologies transferred from MNEs to their subsidiaries established through joint ventures tend to be older than the technologies transferred to wholly-owned subsidiaries. Above arguments and evidence mean that WOSs will receive more advanced technology and knowledge from parent MNE than the JVs do, as there is less unwanted diffusion of proprietary technology and knowledge. Another reason to say that loosely coordinated subsidiaries tend to produce less transfer of knowledge and technology, is that the primary orientation of these subsidiaries is regional or global market, and will provide products, services or technology with global standards (Holm and Pedersen, 2000; Frost et al., 2000; Forsgren, 2002).

Thus, the two levels of ownership, wholly owned foreign subsidiary versus Sino-foreign joint ventures, should have different implications for the local orientations, local collaboration and resource transfer. It can be argued that: the MNE entering China through joint venture mode will be more local-oriented in sourcing and sale, and create more local collaborative agreements. However, JVs will not necessarily create higher degree of resource transfer to local firms.

**Age of foreign subsidiary**

Many theories discussed above recognize time is a very important factor in the analysis of local linkages. A high degree of local linkage creation is associated with time cost of operation in local networks. The ‘age’ refers the measure of time since the foreign investor owned the local entity, rather than the date since establishment.

Newer foreign investors may choose to import from their existing suppliers or group affiliates abroad. When a MNE is started up in a foreign host country, a large proportion of its supplies are likely to consist of imports, since it does not yet have an existing network of suppliers. Besides, the existing suppliers to that firm in the country of origin benefit from an advantage when it comes to negotiating contracts for the delivery of e.g. parts to the subsidiary. And as the extant supplier base in the home market may either
hesitate to start production in the new host country of its client and will need time to actually do so.

Unless the network partner is viewed to have the ability, integrity or benevolence (Mayer et. al., 1995) to contribute to joint business undertakings, the focal subsidiary is unlikely to undertake the necessary steps towards deepening the relationship. It is generally recognized that there are potential benefits for foreign subsidiaries to be localized, but also that it takes time to identify and develop domestic suppliers, customers especially when the needs of the MNE for the level of quality, price, quantity and other requirements have to be taken into account. With time the likelihood of local linkages with domestic firms will increase as the foreign investors get a better knowledge about the quality of the local firms and the access to them. This applies also for foreign-owned firms establishing in the host country in order to maintain their privileged relationship with the MNE, although the issue of quality will be less relevant for those firms.

The age of the plant is a key factor in explaining embeddedness into the local economy (McAleese & McDonald, 1978). Establishing relationships with local suppliers, buyers, distributors, competitors and government are both formal and social investment which will probably have taken years to create and sustain. As such, the embeddedness of firms is often a function of how long the MNEs have been present, since firms tend to build incrementally. The age of the plant is a key factor in explaining embeddedness into the local economy. The foreign firm gains useful experience, over time, of the local business environment, and such knowledge will be complemented by the recruitment of local managers. Longer-term linkages create potential for on-going cooperation between foreign and domestic firms (UNCTAD, 2001) which in turn might facilitate more intense linkages. Furthermore, a long history of cooperation and interaction contributes to perceived trustworthiness as has perceived similarity of the other party (Mayer et. al., 1995).
As the MNE internalises its activities across borders, time influences decision inasmuch as it is part of the experience process of the MNE. In general, the amount that an investor can and should invest in local linkages in the host country depends on its prior position and experience in the domestic network (Castellani and Zanfei, 2002). A relationship functions in the context of a particular history and environment including other relations. The previous history of interaction and other relations provide comparison levels from which to judge performance and other aspects of relationship functioning (Anderson and Narus, 1990). Experience might also refer to the international experience, which is linked to the number of activities the firm has overseas or to how long the firm has had international operations. The age of subsidiaries since establishment is a good predictor for this merit. It might be related to the accumulated knowledge on the host country itself and may be expected to further reduce the behavioral uncertainty. Acquaintance with a specific context will reduce the uncertainty concerning the behavior of potential partners engaged in a given transaction. A subsidiary which is more familiar with the market is more likely to commit resources and investment to local operations (Chang, 1995). For instance, foreign subsidiaries of MNEs without much knowledge about local firms have to rely on their parent firm or affiliates for the supply of intermediate inputs in the early stages of their operation and it is likely to import a greater share of its inputs.

Local linkages could depend further on the economic development and the stage of development of the local economy. The firm needs to establish credibility as a producer, and local inputs may be included after the operation has proved successful. Countries may not follow the same development path, and some regions may develop faster than others. Production capability and international experience of local firms in more developed locations may boost the product's competence to export to overseas markets. One would therefore expect the extent of local linkage to increase along with the length of development history of FDI home country.
Hence, these reasons would thus lead to the following expectation: *The longer the time since establishment, the greater will be a subsidiary's propensity to create local sourcing, sale, collaborations, and get involved in knowledge intensive relationships.*

**Country of Origin**

Most of the literature in international management have explicitly or implicitly assumes the existence of different types of MNEs, but meanwhile the heterogeneous characteristics of FDI as one set of factors that influence FDI economic growth have received little systematic empirical attention (Nunnenkamp and Spatz, 2004; Jones, 2005). Based on these notions and as a point of departure, the heterogeneity of FDI or MNE may associate with their linkages with local firms, that is one type of investment activity carried out by a foreign firm leads to an improvement of the knowledge base of the local firms and host country.

The influence of the country of origin on MNE activities and strategies has been extensively documented, especially from an institutional theory perspective. The nature of the domestic market, business system and institutional backgrounds influences a wide range of strategic and organizational characteristics of MNEs (Ruigrok and Van Tulder, 1995; Whitley, 1998; Pauly and Reich, 1997), such as the degree of intra-company sales and trade (Harzing and Sorge, 2003), sector specialization (Moen and Lilja, 2001) and human resource management practices (Bae et al., 1998). According to Porter (1990), competitive advantages are created by the interaction of firm-specific factors with the home-country’s resource endowments, demand conditions and industry characteristics. This observation has received some empirical scrutiny and support (Kim and Lynn, 1987; Lall and Siddharthan, 1982; Schroath et al., 1993; Shan and Hamilton, 1991). Dunning (1980), for instance, notes that ‘the ability of enterprises to acquire ownership endowments is clearly not unrelated to the endowments specific to the countries in which they operate—and particularly their country of origin.’ As important elements of the global system and a central element of firm’s competitive advantage, the inter-firm linkages and collaborations have been progressively built in the home country of the MNE. As home countries’ economic systems, business and cultural environments, and
geographical distances are substantially different from each other, foreign investors may reveal different preferences and motives in their FDI decisions, given the similar host country conditions. The combination of home country factors and institutions determine the opportunity set of firms, and because these sets differ across countries, firms’ optimal actions diverge, and hence also firm behaviour and strategy (North, 1991; Wan and Hoskisson, 2003). Examples of the characteristics that are influenced by country of origin effects include intra-company sales and trade and the extent of local manufacturing and R&D (Harzing and Sorge, 2003); sector specialization, forms of ownership and ways of internationalization (Moen and Lilja, 2001); capital intensity of production and technology use (Schroath et. al., 1993); Each of these factors critically influences the impact of FDI on economic growth. For example, industry specialization and R&D have an important impact on the level of technology adopted by foreign affiliates and hence their potential for knowledge spillover (Kokko et. al., 1996; Haddad and Harrison, 1993). This can capture the difference of tendency of foreign subsidiaries for their reliance on local firms and characteristics of linkages with local firms. What matters here is not that the city or region has few or many diverse networks, but ownership characteristics of the foreign participant which shape the nature of firms could impact on their linkages with local firms.

The source of MNEs remains a major factor in determining their impact on the Chinese economy (Buckley, 2004). However, comparing various results as illustrated in the section 2.4, empirical studies agree with no clear conclusion on potential relationship between nationality of firms and local linkage creation. Later analysis in Chapter 3 shows that Foreign investors in Chinese market are very different in type, structure and impact, moreover the characteristics of regional concentration and some strategy diversity among different nationality MNEs. These clues are useful to suggest that country of origin factor might be predicatable for differentiating foreign subsidiaries’ local linkage nature.

Another line of argument relates to the country of origin with technology profile of the MNE. It was argued that MNEs from the emerging markets and western countries have
different types of technological advantages (Yeung, 1994; Shi, 1998; Luo, 1999). Western MNEs' technological assets are typically in proprietary state-of-the-art product and process innovation, generated by heavy strategic investment in R&D (Buckley and Casson, 1976). In contrast, emerging MNEs are relatively small and less innovation intensive. Their intellectual capital assets lie in skills of using standardized technology, and experience in organizing labour intensive production. According to UNCTAD (2001), foreign affiliates producing standardized products with mature, non-proprietary technologies tend to prefer externalized, arm's length procurement. On the other hand, foreign firms which produce specialized and technologically advanced products (e.g. western affiliates) are more likely to prefer in-house production or to retain relationships with a few selected suppliers. This line of arguments leads to the possibility that western investors produce less vertical linkages than that of others. Nevertheless, in many relative reports of foreign investment in China, Western MNEs invest in more projects with higher technology intensity and form technology cooperation or joint venture with local Chinese companies which may imply that they may hold more active and open attitude for knowledge exchange.

Empirical evidence suggested that the MNE's greater control of decision-making authority, limiting the scope for subsidiary's local embeddedness. In this respect, Japanese MNEs are among the most integrated firms, where there is little or no decentralization of decision making (Ruigrok and Van Tulder, 1995) and strong long-term relationships with domestic suppliers and distributors hamper the creation of linkages with local suppliers in host countries (Thomas III and Waring, 1999). United States and United Kingdom MNEs make far less use of an integrated and centralized strategy with less reliance on headquarters-affiliate trade than Japanese counterparts (Yip et. al., 1997; Harzing et. al., 2002). Therefore, when decision-making is decentralized and the division of labour is worldwide, there may be considerable external inter-firm relationships, moreover, lots of local manufacturing as well as R&D and product adaptation.
External linkages creation depends on psychic distance and the level of trust in the host environment (Johanson and Matton, 1988; Casson and Cox, 1993). Rodriguez-Clare (1996) argues that backward linkages depend positively on transport costs (and, hence, probably on distance) between the home country of the MNE and the host country, as well as on cultural, social and legal differences. U.S., Europe, Japan, Korea and Greater China Region are the main source of investment in the Chinese petrochemical industry. MNEs from various nationalities present different degree of cultural distance with the host country, which do impact on the configuration of their subsidiaries in China. When choosing to go international, cultural distance between the home and the host countries would significantly affect internalization decision, the need of firms for network participation and the benefits they may derive from it. Thus it can predicate that firms from geographically and culturally remote countries have greater need to gain knowledge on the host countries, and may have an incentive to use dense network location to eliminate these difficulties.

The unique feature of FDI in China is that the majority of China’s inward FDI has been contributed by Chinese origin FDI from Hong Kong, Macao and Taiwan (Wei and Liu, 2001). Because of the shared culture and family relations between overseas and mainland Chinese, local enterprises have less uncertainty but more mutual trust with overseas Chinese than with other foreign investors (Wei et al., 2005), mainly from the United States, European Union and Japan. These characteristics of Chinese origin FDI are expected to impact on local linkages in contradictory ways. First, as the newest source of petrochemical MNEs, increasing labour costs in Hong Kong and Taiwan have forced many manufacturing firms to relocate in China. However, their supplier relationships may be still remained in their home country. The Chinese origin FDI may import intermediate goods, taking advantage of the tariff exemption. Given the fact that the Overseas Chinese investors are geographically closer to the Chinese market and have a greater affinity for its cultural environment, have hometown connections, use the same language, etc., they will demonstrate a higher local sourcing activity than the investors from the US, EU and Japan (Schroath et al., 1993). The cultural advantage substantially reduces contractual risks, and makes overseas Chinese investors more easily to form
local linkages. Therefore, this propensity for the Chinese origin FDI, results in lower linkages creation in the economy. The Chinese origin FDI also has a great propensity to export, which is unlikely to cause competition with domestic producers, which would not necessarily result in shrinkage of intermediate good demand. These arguments also imply that foreign firms of different nationality may impact differently on local economy, and it is thus meaningful to investigate source country impacts on the sign and degree of technology transfer.

The results toward country of origin are lack of consensus empirically. It has been claimed that MNEs of different home countries can increase, decrease local linkages, or have no significant impact. However, the balance of evidences and arguments tend to support that: Country of origin of MNE will affect the likelihood of local linkages creation. Presumably, Western subsidiaries will have a higher local orientation and resource transfer than Japanese and other Asian MNEs.

**Regional differences**

As reviewed earlier, the significance of host environmental factors has embarked on international business research. Host country contexts considered as dissimilar types of resource environments can provide firms with endowments: factors and institutions; constitute a core component in understanding firm capability and diversification (North, 1990); and help to determine the type of MNE affiliate and competitive advantage of the host location. Regarding to the study of MNE linkages and their impact on local firms and economy, like this research, regional location of the foreign subsidiary in the host country constitutes the level of analysis. As discussed earlier, the significance of sub-national location has been clarified in international business research. Regional environment is important to the explanation of local linkages because it determines where the foreign subsidiaries may wish to internalise their activities and emphasize the impact of environmental changes on a variety of forms of inter-firm collaboration.

FDI is considered as a networking activity and local linkages are pursued by overseas investors. This means foreign investors are looking for external networks which satisfy
their resource demands related to the main objectives of the firms' investment. Moreover, local networks are viewed as an environment endowed with more or less these resource factors, which are available in the market or controlled by other firms. It can be further inferred that, locations of FDI may be different in terms of resource compositions which interact with motivation, the local complementary industry and the local linkages they create. These resource compositions are of variety covering institutional, market and technological environment, for instance production costs (wage rates/labour costs; energy costs; input and component availability and price; tax rates), transfer costs (tariffs and non-tariff restrictions; transport costs), incentive and assistance from central and local governments, market size and growth potential, political stability. These factors can portrait a region or city as a favourable location for the attraction and development of local linkages.

Above all, foreign firm could obtain access to these external resources through its network relations with local firms. Foreign investors could be more active in the pursuit of local linkages in certain locality compared with the other locations, because their counterparts in other regions offer more resources that cannot be obtained easily. If presumably linkage formation and intensity differ by regional locations, it will be worth to explore the location-specific factors causing the differences. The discussion below provides some specificity of location factors in explaining the propensity of foreign firms to create local linkages within host country. There is close inter-relationships between host country environment and local firm-specific factors. On one hand, the relevance of a particular firm-specific factor of local firms is contingent upon the host-country characteristics. On the other hand, some factors, such as cost and technological capability of the host location reflect the average and aggregate picture of all economic actors. Therefore, analysis of regional differences in this research embodies both environmental and firm-level characteristics.

Cost advantage
The cost advantage of using a local network also depends on the quality of the infrastructure. Low cost and price have been approved as the major factors to facilitate
FDI. However, there may be relatively low demands to product quality and innovation in the cost-advantage location. Cost seeking investors are believed to create relatively fewer linkages since investors who are only looking for these productivity gains, factor cost advantages and flexibility resources foster few and ‘shallow’ linkages as not interested in establishing local linkages (Evans, 1998; Cypher and Diez, 2004).

**Technological capability**

It is believed that countries differ in their ability to utilize or innovative technologies, and this difference manifests itself in their productivity, growth, or trade performance. It therefore makes sense for most of the research to conceive of national differences in technological capabilities. Analysis of regional technological capabilities is nevertheless important because of the current dominance of some partial explanations of industrial success, which may lead to misleading policy conclusions. Technological capability at macro-level can be measured by R&D expenditure and scientist/engineer training (Dunning and Lundan, 2008). Theories of IDP and technological accumulation of the country imply the FDI impact on technological capability generation of the host country or region, and at the same time shed light on the capability conditions under which MNE and local firms have to operate and form local linkages.

The extent to which FDI contributes to growth also depends on the level of technological sophistication and the stock of human capital available in the host economy. FDI has been found to raise growth only in those countries that have reached a minimum threshold level of technological sophistication or the stock of human capital (Borensztein et. al., 1998; Xu, 2000). Evidence is found in studies regarding technology gaps (Kokko et. al., 1996; Haddad and Harrison, 1993) which indicates that it is the relative difference between local and foreign firms that determines the degree of spillover, which are thus dependent on the absolute level of sophistication of both local and foreign firms. In developing countries, many factors such as quality and quantity of local supplies, the role of export platforms, and lack of intellectual property protection inhibit development of networks of linkages between MNEs and local enterprises. It has been argued that the ability of local firms to benefit from the MNE depends upon their
absorptive capacity (Criscuolo and Narula, 2008; Lyles et. al., 2008) which depends upon and reflects the competence of the local firms. The higher the level of strategic resource in the target locality the more developed the local firms usually are. High competence usually signifies complementary strategic resources that are non-generic in nature. Furthermore, in case where the inter-firm relationship is based on dynamic capabilities, such as innovative ability, specialized skills or other non-factor cost capabilities, the linkage is more likely to be mutually beneficial (Altenburg, 2000). Therefore, foreign companies in locations with intensive strategic resources tend to be embedded with the local milieu and more likely to generate knowledge diffusion to such local firms.

**Industry agglomeration/cluster**

The density of local networks is of particular importance in the overall strategy of the MNEs. There is some systematic evidences show that MNE are attracted to the cluster of economic activity (Wheeler and Moody, 1992; Head et. al., 1995, 1999; Gong, 1995; Wei et. al., 1999). The concentration of FDI activities is also supported by Dunning's observation (1997) that suggests MNE exhibit strong tendency to concentrate investments geographically within countries. The basic idea in the literature of industry cluster is that linkages between firms, institutions and other economic agents, located in geographic proximity, generate advantages of scale and scope (Porter, 1998b; Lloyd and Dicken, 1990). Studies in the tradition of geographic clustering have shown that interaction taking place in a geographically confined locality has many unique attributes, resulting from the proximity of the parties involved (Keeble and Wilkinson, 2000; Storper, 1997; Scott, 1998). In China, agglomeration and industrial cluster has early development in the special economic zones, following by creation of industry and technology parks, which lead to more purchase of local materials and capital equipment. Through professional, social, and exchange relationships, firms in these clusters share advice, engineering solutions, and information about new technologies and practices (Nohria, 1992; Saxenian, 1994). This implies that via dense networks, knowledge is more rapidly diffused throughout the network actors. Infrastructure is an important indicator to the level of economic development as a function of the quality of the
location advantages that the host location can provide. The quality of infrastructure has been found to exert a significantly positive impact on inward investment (Hackett and Srinivasan, 1998). Preferential assistance and spending on new infrastructures and improvements are incentives for FDI, moreover lower operating risks and enhance efficiency for establishment of inter-firm relationships. For instance, a good infrastructure facilitates physical transport of components within the country and communication between assembler and suppliers (Lowe and Kenney, 1999).

**Government role**

Local conditions are inevitably influenced by the local government policies and are path dependent on historical factors. Local institution in a host economy is one of the critical elements of the business environment of an MNE. Government in the host country provides incentives, constraints and business support infrastructure enhancing performance (Lewin et al., 1999; Lewin and Koza, 2001). The salience of government intervention increases significantly when firms engage in international business operations (Kohli and Jaworski, 1990). Although government policies do not determine the choice of companies’ differentiated global strategies, but they do influence comparative advantages and the business environment, which in turn impact upon parent firms’ location choices and the position of subsidiaries within the MNEs’ international network. The foreign-local linkages formation process may be also affected by a host country’s overall policy environment. Various types of government’s interventions have been recognized in many researches (e.g. Altenburg, 2000; UNCTAD, 2001; Veide, 2002). They include generic import-export strategies, specific linkage-facilitating programs, compulsory regulation on institution arrangement and business practise, and so on. These government instruments have different aims and may vary across regions in the host country.

Local government also actively seek to encourage sufficient linkage and spillover effect on the local economy. The developing country commonly put forward regulations conducive to business linkages development. Dunning (1993) pointed out the most influential factor affecting the FDI firms’ choice of backward linkage is government
policy on indigenization of business. Belderbos et. al. (2001) found that local content regulations have only modest positive impact on linkage creation and do not stimulate foreign firms‘ purchase from local suppliers. MNEs have to consider ways of improving local connections because of the local content requirements of the host government. Strict local content regulations impact on MNEs‘ value chain activities, particularly sourcing strategy. However, there is no evidence could argue that compulsory requirements boost more technology transfer. Even when government policies are in place in terms of local content requirements, their efficiency is not guaranteed.

Amin and Thrift (1994) use the concept of ‘institutional thickness’ and suggest that ‘strong institutional presence’ and ‘high levels of interaction amongst the institutions in a local area’ may generate strong local embeddedness. High quality institutions can facilitate the start-up of new local ventures that can exploit collaboration between foreign MNEs and local firms. In addition, government make contracts—in particular with regard to supplier relationships— more easily enforceable and thereby lower the transaction costs of local sourcing for MNEs. These reasons imply that government‘s assistance to foreign sector‘s business operation may facilitate foreign firms‘ linkages with local organizations. High quality institutions can thus enlarge the potential for positive effects of FDI on technology transfer and linkages.

The host market’s openness has also been found to positively influence the extent to which FDI contributes to growth (Balasubramanyam et. al., 1996). Openness is a reflection of government policy, and a measure of the existing level of competition in a host economy, specifically in a developing country like China. Moreover, there is wide variation in the level of economic development and the stage of economic reform between open economic regions and elsewhere (Shan, 1991). Open economic regions usually provide a better cultural environment, business atmosphere, and economic conditions than more closed regions. In locations that are more open to trade, market distortions are less and the level of efficiency and competition is higher. It is argued that some host countries are more conducive to local networking than others because of the availability of internationalized institutions (Johanson and Mattson, 1988; Chen et. al.,
2004). The more support from these institution, the more attractiveness for MNEs' local linkage participation. Due to comparatively infant nature of industries and higher market risks in developing countries, the government’s role in local linkage formation may be particularly important (Esser et. al., 1996; Dunning, 1997). In closed economies, the lack of competition would allow MNEs and local firms to sustain inefficiencies, and therefore resource allocation would be sub-optimal with detrimental effects on growth. Non-open regions also experience much lower levels of inter-firm competition and maintain a stronger collectivistic tradition than open regions. Host country and regional government have introduced policies aiming to enhance the size and the benefits from FDI. Those designated as ‘open economic regions’ offer investment privileges to foreign companies (e.g., low tax rates, duty-free import, and preferential financing). With increasing favourable governmental policies for foreign firms, such incentives may not the primary reason for location, but government incentives play a substantial role in determining the final investment decision.

In the context of China, the Chinese government has adopted different policies towards different regions, which result in different levels of internationalization cross regions due to the uneven openness and development. The most common partition of Chinese regions is to group them by an integrated method including economic measurement, geographic proximity, and government policies. Among these economic regions within China, the Pearl River Delta is preferred by foreign companies not only because they are prioritized, but more importantly, most of them have traditionally been commercial and least government intervention. Trade policy and FDI incentives in SEZs of Pearl River Delta prominently foster the volume of foreign activities and to some extent of overall economic development in this region. The disparities are, for instance, Pearl River Delta and Yangtze Delta have much better infrastructure than Bohai inner areas (Bohai Rim); on the other hand, Yangtze Delta and Bohai Rim have larger integrated market. Pearl River Delta also has a long history of international trade and contacts with the overseas markets. It can be postulated that Pearl River Delta as the most internationalized and open location may enhance foreign investors’ confidence and facilitates foreign firms to enter local networks. Some empirical studies in Chinese context found that firms in open
areas tend to rely more on arms-length relationships for transactions than those in non-open regions due to enhanced market competition among organizations (Xin and Pearce, 1996). On the other hand MNEs investing in less open region such as Bohai Rim in China may have a stronger rationale for using local linkages when it is expected that MNEs in China are mostly efficiency-seeking and their investment are motivated low cost factor. However, collaboration and knowledge transfers are more likely to occur in Yangtze River Delta and Pearl River Delta where MNEs perceive there are benefits to be gained, such as improved quality, reduced costs or improved services.

In all, it can be expected that, local linkages will be differentiated among their regional locations within China, which are in conjunction with the location-specific factors (cost, infrastructure, local technological capability, industry cluster, and government role).

2.4.4 Association between local orientation, local collaboration and resource transfer

The development potential of local linkages depends on the interaction between quantity and quality of linkages. This research argues that MNE subsidiary’s strategic orientations is related to the strategic outcomes, which means quantity of local sourcing and sale may be relevant factors in explaining their generation of local collaboration and resource transfer in the host country.

In most cases, foreign firms will only devote resources transfer to local firms if they expected returns from such efforts outweigh the cost. In this respect, there will be a greater possibility of selecting effective and reliable partners, thus increasing the expected payoff from knowledge transfer. In fact, the growing literature on the impact of MNE or FDI has emphasised that foreign-local technology transfer is expected to be differed according to the nature of products (Supapol, 1995), absorptive capability (Wong, 1991).

On the other hand, Saliola and Zanfei (2009) argued that potential level of inputs produced locally reflects the level of industrial development of the host country, which
implies that, when inputs are sourced in host countries especially in developing countries, a high share of local sourcing may signal that MNEs are more concerned with cost saving than with quality and knowledge content. Under these circumstances it thus can be expected that high shares of local orientation of sourcing are associated with little or no knowledge transfer. However it cannot be denied that highly localization will increase the reliance of foreign firms on local context, and are willing to use advanced technology and transfer their technology and know-how to local firms in the purpose to guarantee the quality of supply, competence of products, and hence reducing the risk of collectively behaviour.

Dunning (1993) claims that export-oriented subsidiaries are usually less integrated into the local economy, than their domestic oriented counterparts. Local market-oriented subsidiaries are likely to employ more local suppliers than do export-oriented firms (Belderbos et. al., 2001). The export orientation of MNE is likely to be relevant to local linkages also since it contributes to determine the degree of contact foreign affiliates have with local firms in upstream and downstream industries. MNEs generally invest in host countries for market seeking purposes and leave more decision-making autonomy to their subsidiaries, while export-oriented foreign firms may be more integrated in their parents’ global networks of sales and supply and source more in the international market since local suppliers may not meet their global standards. It seems natural for export-oriented firms to need less help from local firms, to the extent that they can import intermediate goods. Others argued that linkages between export-oriented affiliates and local firms will be few but deep. This implied that the links between the latter and local firms may more efficient and competitive in product and process upgrading as the foreign investor must ensure that local linkage partners can meet quality and other performance requirements in integrated export markets (UNCTAD, 2000b; Hansen et. al., 2006). Local firms are often capable of serving foreign firms aimed at local markets, because quality and technical requirements are lower. This also explains that domestic market-oriented subsidiaries generally purchase more locally than export-oriented firms.
As regards forward linkages, local companies establish necessarily business-to-business contacts with local oriented foreign suppliers and not with export oriented ones. Therefore they may obtain the productivity benefit of the advanced know-how and technology embedded in inputs provided by host-market oriented MNE. A higher level of local linkages intensity for example implies greater integration between MNEs and local firms in upstream sectors and consequently the relative importance of investment motives will determine which type of FDI has a greater potential for knowledge transfer and economic growth to the largest extent. Local market-oriented foreign subsidiaries are argued to generate more technology transfer at firm levels than export-oriented ones.

Comparing with export-oriented firms, local market-oriented subsidiaries will be probably more customer-oriented and invest in specialised service and technology into supply chain in order to gain local market share. In contrast, MNEs that establish subsidiaries as export bases to serve other markets are more likely to be part of tight international production networks with established key suppliers, which lowers the probability of local sourcing. In export-oriented industries, demands on quality and costs of inputs are much higher than those of national markets in developing countries (Dicken, 2003).

Above all, two opposite expectation can be made regarding to the positive impact of local orientation on the resource transfer to local firms, that is, higher local orientation implies higher embeddedness of foreign subsidiaries and propensity to transfer beneficial resources to local firms; High share of local linkages is likely to imply concern of low cost in local operation, and with little or no transfer of knowledge to local firms.

Strategic orientation of value chain activities is also an important indicator for local collaboration intensity which depends on the strength and extent of local sourcing and sale. In the concept of linkages, the ‘interaction’ in vertical or horizontal linkages which could facilitate technology diffusion, which in line with the literature outlined above. While the inter-firm linkages discussed earlier illustrate an important ways in which MNEs become embedded in host economy, supplier linkages are not the only indicator
of embeddedness. If MNE subsidiary decides to import or export the majority of their inputs and outputs rather than to localize them on host markets, institutional and technological embeddedness through collaborative linkages will remain insignificant. MNEs with globally integrated strategies may be relatively inclined to opt for high levels of internalization as under-performing partners may disrupt their global value chain and potentially damage their global brand and reputation. Firms with localization strategies are relatively more inclined to foster cooperation where they operate as they will need the resources and knowledge of local firms to adapt to local conditions and as they will tend to see each investment as a separate portfolio. Therefore these MNEs have less concern in regard to the cultural distance and institution constrains, as well as compromise to set up knowledge intensive agreements in that country and sector. Foreign subsidiary with an extensive local network in a given country and sector will have a higher propensity to pave the way for a greater involvement of local counterparts in collaborative activities. MNEs buying their inputs locally are likely to form long-term oriented relationships as part of more comprehensive value chain agreements with indigenous firms (Andersson and Forsgren, 1996).

Therefore, the willingness of a foreign company to augment its collaborative linkages is likely to depend on its sourcing and sale status, that is: Foreign subsidiary's strategic orientation of potential contacts with local firms such as purchasing goods from local suppliers and local sale arising through the firm's marketing channels will impact on local collaboration formation.

2.5 Conclusion

In this chapter, definitions for key terms used in this research were provided. A comprehensive view of inter-firm linkages was then developed, following the analysis a wide streams of existing literature. They revealed that, on one hand, how FDI or MNE impact on host countries through local linkages; on the other hand, they explained how linkages may occur and implied the potential factors may have influence on inter-firm linkages between MNEs and local firms. The literature and previous studies also
postulate that linkages and resources transfer should not be isolated in terms of linkage effect. It needs to better understand the resource transfer as a character of local linkages that may exist in these linkages at the same time.

In the theoretical framework, propositions and questions are formed for the later empirical analysis. The expectations concern the determinants of local orientation and outcomes in local linkages. These factors are foreign subsidiary’s country of origin, ownership mode, age, and the regional differences in the host country combined with location-specific factors. It is concluded that, MNEs are the leading force on local linkages. Wider literature on the impact of MNEs on host country development suggests that the nature of the affiliate’s strategy and activities in the host economy play a crucial role in determining the extent and pattern of linkage formation. This is not to argue that all the world’s networks are determined by MNE, but to indicate the dominant role of MNE. Foreign subsidiary as the core unit engaged into MNE network and local linkages, its ownership mode and experiences create the power for local linkages and generation of resource transfer. Foreign firms in a specific geographic region or location with industrial cluster could have different network activities taking place comparing with other locations which means the relationship with local firms could be different inside and outside clusters. Whilst locality of foreign investment that bearing other distinct characteristics could shape local linkage in other dissimilar ways. Local orientation of sourcing and sale is expected to exert positive impact on the resource transfer and local collaboration.
CHAPTER THREE
BUSINESS ENVIRONMENT IN THE
PETROCHEMICAL INDUSTRY IN CHINA

Since China’s WTO accession in 2001, there have been both challenges and opportunities for the local and foreign firms in petrochemical industry. This section provides a background analysis for FDI and MNE in particular the case of petrochemical industry in China, which focuses on the environment and strategies of MNEs in China. This chapter is an extract from the analysis of data collected at the preliminary stage, which sculpture the context of this research. Based on the whole population of the 3283 Foreign Invested Projects (FIPs) in the petrochemical industry as well as the secondary data, this chapter is able to provide an analysis to MNE presence across different industry segment, country of origin, ownership mode and regional location in China.

3.1 Status and Impact of International Trade in the Petrochemical Industry

China is becoming an increasingly important consumer and supplier of chemical products because of the strong demand within the country and cost advantages over Western industrial countries both in the production of chemical products and for key customer industries building up production capacities. In 2007, ranking after the Textile Industry and Machinery Industry, it contributes almost 10% of China’s GDP (NBSC, 2007). Although the productive capacity of petrochemical industry in China has been developed, it is dependent heavily on imports. It suffers from a shortage of upstream resources owing mostly to the surging oil prices and lack of water, as well as a lack of advanced technology for fine chemical. Other than the shortage in raw materials, petrochemical industry also suffers from limited energy supply, transport problems and electricity shortages. The labour cost has grown rapidly since 2007 due to the increasing inflation, and the surging oil prices also raised the price of raw materials and transport...
costs (HKTDC, 2008). The infrastructure also requires to be improved to maintain the
growth rate. Despite these problems, the petrochemical industry is growing due to strong
demand for chemicals within the country and also owing to the cost advantages that over
the western chemical producing countries. Moreover, many Chinese companies are
involved in the process of setting up extensive production capacity. There are substantial
exports in Chinese petrochemical industry, although the local production capacity for is
around 80% of demand since 2001 (HKTDC, 2007). China has been a major importer of
oil and major refined petrochemical products for many years, having a $41 billion
chemicals trade deficit. Exports of high value-added chemicals are encouraged while the
development of enterprises with high energy consumption and high pollution will be
inhibited by new policies.

Population and the standard of living are working in tandem to increase the demand
from many of the petrochemical-based raw materials, intermediates and finished end
products that typify a modern lifestyle. The FDI in China’s chemical industry has been
the highest in the world for five successive years. In recent year, growing demand for
chemicals and chemical-related projects has ushered in an unprecedented era of foreign
investment, and many of the world’s petrochemical giants have put a stake in the ground
in china, literally and figuratively to take part in this huge and fast growing economy.
Since 2005, China has become the world’s third-largest chemical producer, behind the
U.S. and Japan. Even though petrochemicals are dominated by state-owned companies,
foreign investment in the petroleum and chemical industries in China has been
substantial, with more than 20 new projects were set up every year since 2006 (MOC,

Foreign MNEs set up factories in China resulting in extremely increasing production
capacity. DuPont’s new factory of dioxide facility with chlorination technology in
Shandong Province is three times bigger than the largest domestic factory. By the end of
2005, total output the world’s top 10 polymer manufacturers accounted for 30% of the
nation’s total output. These foreign players have brought mature technology for the
production of some chemicals which are still considered ‘new materials’ by domestic
companies (e.g. silicone, polyurethane and engineering plastics). An analysis of a foreign petrochemical firm in Shanghai (Yeung and Li, 2000) found the important role of the firm’s local embeddedness in regional development along with increasing local production linkages and technology diffusion to local enterprises. Moreover, MNEs have enabled Shanghai to further its goal of becoming an international economic, trade, and financial centre. The contribution of FIPs to total export reached 31% in 2006. Partly drawn by business linkages with the world’s big MNEs located in Shanghai, many international banks and trading companies have established subsidiaries in the city. MNEs’ entrance has forced domestic enterprises to face competition from foreign players, at a time when they were changing their strategy to focus on capital output instead of goods output.

The entrance of MNEs, however, has also brought problems to the local industry. Bargaining and competition between MNEs and the local players are quite tense; in some cases, local involvement brings losses to the local side (authors’ interviews with government officials). Foreign rivals have entered the developing countries, while local companies’ technology is still in the exploring stage. For example, value added products in the silicone industrial chain and Titanium dioxide are two of China’s key exports, but none of the domestic companies have mastered the technology for the development and production.

### 3.2 Value Chain of the Petrochemical Industry

The value chain of the China’s petrochemical industry explains to a great extent the strong government interest in its development. The petrochemical industry embraces numerous activities with highly complex relationships, and supplies a wide range of industrial products to the rest of the economy—from crude oil, to synthetic products and consumer goods. There are significant difficulties to define the boundaries of the petrochemical industry because of the complexity of its operations, and the diversity of its products. Figure 3.1 represents the core value chain of the petrochemical industry (shaded on the diagram) and its connectivity to other industrial sectors.
The complex value chain relationships reflect the complexity of the industrial environment, which is an intricate part of the overall Chinese business environment. The petrochemical segments could be roughly classified as crude oil, oil refining and cracking (i.e. basic petrochemicals), and downstream petrochemical segments (including a number of chemical process industries such as rubber, plastics, fibbers, dyers and adhesives, agrochemicals and pharmaceuticals. Wholesale and retail of petrochemicals and petroleum products has emerged as a new segment of the value chain in China, where liberalisation policies have invited new market entries and competition. The total volume of output is dominated by relatively few products, even though their range is vast. Well over half of the total output of the world petrochemical industry by weight is in the form of plastics and resins, and this broad group, together with synthetic fibbers and synthetic rubbers, accounts for more than three-quarters of the total investment output (Lu and Todeva, 2000). The petrochemical industry has higher degree of vertical integration, compared with other industries (Kamakura, 2003). Although there is a clear
structure of input and output markets, there is a lot of overlap in processing technologies. The high logistics and transportation costs are another incentive for co-location and vertical integration of related operations.

The world's largest petrochemical MNEs have investment in China since the 1990s and have shown a tendency for accelerating investment commitments, increasing market power, and broadening investment range. MNEs own advanced know-how and cutting-edge technology, specially, in certain areas of fine chemicals, functional chemicals, and specialty industrial chemicals. Figure 3.5 below summarises the major MNEs in each segment of China's petrochemical industry.

**Figure 3.2 Major MNEs in Sub-Segments of the Petrochemical Industry in China**

<table>
<thead>
<tr>
<th>Sub-Segment</th>
<th>MNEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil Exploration</td>
<td>Netherland (Shell, Philips), TOTAL ELF (France), US (Chevron, Exxon Mobile), UK (BP), Japan (Iwai, Mitsui, Marubeni, Idemitsu, Japan Energy)</td>
</tr>
<tr>
<td>Refining</td>
<td>US (Exxon Mobile, Dow), Netherland (Shell), UK (BP), Germany (BASF) France (ATOFINA, TOTAL ELF)</td>
</tr>
<tr>
<td>Petroleum Refining</td>
<td>BP, Shell, Exxon Mobile</td>
</tr>
<tr>
<td>Downstream Petrochemical</td>
<td>US (Berkshire Hathaway, Dow, Du Pont, Chevron, Exxon Mobile, Philips, Goodyear), UK (BP), Germany (Bayer, Hoechst AG, BASF), Switzerland (Ciba), Italian (Eni S.p.A), Netherland (AkzoNobel, Shell), French (Michelin, Rhone-poulenc S.A, TOTAL ELF), Japan (Bridgestone, Itochu, Sumitomo, Mitsui, Idemitsu, Mitsubishi), Korea (LG, SK, Iwai, Marubeni), Hong Kong (Jardine Matheson)</td>
</tr>
</tbody>
</table>

*Source: compiled from Emage research (2007)*

The major petrochemical MNEs in China mainly come from Europe, US, Japan and Korea and their investment spreads across all segments of the industry. It is obvious that western and Japanese companies are the dominant players conducting FDI in the Chinese petrochemical sector. The inward petrochemical FDI from Asian emerging markets continues to increase, but is still lag behind Western and Japanese sources. After breaking away from Asian financial crisis, Japan and Korea have turned around to China...
with bloom of market demand. MNEs in China are not only involved in production of
final output from upstream to downstream, but also included in their portfolio related
intermediate products. With the opening of the market for finished oil products, MNEs
have expanded their business to other related sectors, such as the distribution, storage
and infrastructure areas. These operations are becoming an important complement in the
petrochemical manufacturing business, particularly in the cases of Shell, Exxon, and BP.
Oil refining is the sector with the least MNEs investments, while the downstream
petrochemicals segments have attracted the largest amount of FDI, especially from
Japan and Korea. This distribution is induced by the specific government restrictions in
the industry and the nature of the capital investment risks and particularly the high
investment risks in the upstream segments.

In addition, the geographical proximity and close cultural and linguistic links between
south and southeast China and the overseas ethnic Chinese communities in Hong Kong,
Taiwan, and Macao have contributed to the high concentration of FDI in the southern
coastal region. It should be noted that the majority of these investments are in the form
of small, export-oriented enterprises, most of which have been transplanted from Hong
Kong or Taiwan in pursuit of the abundant supply of less costly labour in the mainland.

3.3 Institutional Environment of the Petrochemical Industry

The regulatory environment is of extreme importance to the petrochemical industry in
China. The complex value chain relationships reflect the complexity of China’s
petrochemical industry environment, hence MNEs are likely to confront a higher level of
complex government decisions, and are subject to multiple stages of political
negotiations. MNEs managers make their important decisions after taking into
consideration not only market factors such as customers, competitors and demand, but
also the important roles played by various government entities in China (Li and Zhou,
2005). Figure 3.3 below illustrates the institutional structure of the Chinese petrochemical industry.

**Figure 3.3 Institutional structure of the petrochemical industry sector in China**

The lengthy approval process by central government in the past had created incentives for foreign investors to build small plants and to break large projects down into smaller phased projects. The central government has become aware that such investment strategies undermine its energy efficiency goals, and has made efforts to discourage the small-scale FIPs, and to attract more large scale and integrated projects. China's domestic market for petrochemicals and chemicals is served by a number of large petrochemical producers under the big three integrated enterprises, Sinopec (China Petroleum and Chemical Corporation), CNPC (China National Petroleum Corporation)
and CNOOC (China National Offshore Oil Corporation) who report directly to the central government. They remain dominant producers and sellers in key markets of various sectors. Another group includes major ‘group companies’ such as Shanghai Hua Yi (Group) Co., that fall under provincial governments. The chemical industry in many provinces is organized around a provincial-level group company. The provincial-level group company can be a useful first stop for a foreign investor seeking information for a proposed JV that is not a project in the petrochemicals sphere. The influence of this group company, and the extent to which it will be involved in the negotiations, will vary among provinces. These entities may be directly involved in negotiations for major projects, but for minor projects they may delegate negotiation authority to the subsidiary that will become the direct equity partner. Once the venture is formed, decisions regarding day-to-day operations are rarely elevated above the level of the venture partner. Many of these Chinese firms are capable of producing high quality and perfectly serviceable products despite their financial difficulties. Private and township enterprises constitute a third group.

The fourth category, the foreign-invested sector, overlaps the other sectors. Foreign firms in China’s petrochemical industry face direct competition within their own immediate geographic location and position in the value-chain. For example, the global resin industry excluding China has five major players, but Chinese industry has roughly 100 such companies listed in this category (Sigmund, 2002). China has at least 8,000 chemical producing companies, ranging from large-scale petro-chemical enterprises to tiny township enterprises. This collection of enterprises looks to the outsider like a maze of entities, some partially privatized, that report variously to the central government and local governments. Indeed, the central government, through its approval authority, still maintains a strong influence over companies in the petrochemical sector regarding deployment of capital, while provincial-level authorities usually exercise far less control, and township enterprises have a considerable degree of independence from direct government influence.
Compulsory regulations and incentives on MNEs’ activities are the most important tools adopted by the central and local government. In order to obtain large scale of FDI inflow, the government at different levels offers incentives to foreign capital and incentive competition takes place among different regions, typically taking the form of tax concessions or exemptions and customs duty reductions. Some of these incentives are especially applicable to the chemical industry. While some depend on the location of the investment or the duration of the operation, others are available to foreign invested enterprises throughout China. For example, foreign investments in many parts of the chemical sector are identified as ‘encouraged’ in China’s Catalogue Guiding Foreign Investment in Industry (MOC, 2008), and equipment for producing such chemical products may be imported to free of customs duties. Tax incentives are also available based on manufacturing. Foreign enterprises that engage in manufacturing for a period of at least 10 years may be granted tax incentives, and a manufacturing foreign enterprise will enjoy a tax holiday of a two-year exemption followed by a 50 percent reduction for three years, starting from the first profitable year after utilizing tax losses.

China has also promulgated a series of regulations, e.g. tax incentive designed to encourage foreign investment in particular regions of the country, such as western and north-eastern portions that the central authorities have identified as underdeveloped, Special Economic Zones and Technological Development Zones.

In addition to the general incentives for foreign investment mentioned above, China had a hybrid policy such as joint ownership, tariff, quota permit, trade right and sales right for foreign firms, local content requirements and other market access obligations. In response to the surging petrochemicals demand, the Chinese government has paid a special attention to the petrochemical industry, liberalizing business rules and markets, and encouraging an increasing level of participation from MNEs. After joining the World Trade Organization (WTO), it is becoming easier for foreign companies to enter the Chinese market. This has forced Chinese enterprises to face competition from foreign players, at a time when they were changing their strategy to focus on capital output instead of goods output. These liberalization policies are creating a business climate and business conditions that are conducive to the establishment and operations
of foreign subsidiaries. However, the local protectionism is still strong and the effect of high entry barriers may carry over to the current operation of foreign firms. In Petrochemical sector, Chinese government policy had discriminated in favour of FDI, including foreign investment in joint ventures. A local company entering into a joint venture will obtain a variety of privileges compared with other indigenous enterprises, including reduced levels of taxation, authority to undertake import and export business by them and improved access to capital. It has allowed foreign manufacturers to import intermediate inputs on the assumption that such imports would be gradually replaced by local sourcing. Local content requirements typically specified that some percentage or absolute amount of production inputs had to be purchased from local sources or had to be produced domestically. In some cases, a list of specific parts was issued by the government for mandated localisation. Implementation of WTO requirements is fueling investor interest, as is continued liberalization and deregulation in banking, insurance, and pillar industries, wholesale and retail segments and forces the government to open up the services sector as well. Policy changes to increase foreign ownership and reduce or eliminate geographic restrictions are also galvanizing FDI confidence. Joint ventures are losing ground to wholly owned subsidiaries because of, among other things, the increased knowledge about the market environment in China by western investors, and it needs to adapt its policies. China's opening-up from early 2007 allowed domestic private companies and even foreign companies, which have established joint ventures with state-owned oil companies, to enter the crude oil distribution market. With opening up of the domestic market in China, MNEs are able to form sole control subsidiaries. Other restrictions also are being eliminated, such as the trade and foreign-exchange balance requirements, local content requirements and export performance requirements. Reports from industry however, noticed that local content requirements continue to be applied in China at the local level.

As part of the existing policy framework, there are two ceiling permitted on the levels of technology investment within the FDI package. The first one limits the share of industrial property in registered investment to a maximum 20%. The other one restricts the share of know-how in foreign investment to 10%. Setting these ceilings aims to
decrease the risks of the Chinese partner, and limit the control of the foreign investor over the firm. Another FDI related regulation is the export requirements on FIPs.

In addition to the general economy and trade policies, some industry-specific policies were also implemented. The Chinese authorities have also established special preferences for projects involving high-tech and export-oriented investments including tax concessions, rebates and exemptions, and preferential land rents and prices for inputs. Priority sectors include transportation, communications, energy, metallurgy, construction materials, machinery, chemicals, pharmaceuticals, medical equipment, environmental protection and electronics. The Ministry of Finance also reduced the export tariff rebate rate in 2007, and inhibit the export of low value-added chemical products such as caustic soda, phosphate and urea, forcing the chemical industry to develop in the hi-tech, high value-added direction (e.g. producing more titanium dioxide, surfactant, synthetic detergent, chemical agents, etc). At the beginning of 2007, the National Development and Reform Commission (NDRC) raised the access condition for the calcium carbide industry. The access conditions for particular petrochemical products specifying the locations, production scales and techniques for production, e.g. chlor-alkali product. The most stimulus policies in 2009, worth around $73 billion, will likely concentrate on the overall development of the petrochemical sector by investing on technology, restructuring, and optimization of chemical products, in order to increase quality and raise the industry’s global competitiveness. The released details of the package include efforts to increase stockpiles of oil production, bolster domestic demand, improve tax policy and expand loans for the country’s petrochemical companies. The stimulus package is further expected to boost effectiveness, product quality, product availability and distribution, in the petrochemical sector. Moreover, investor confidence, which has already received a boost, is expected to increase as the stimulus further affects the industry. Increased international cooperation through mergers, acquisitions and joint ventures, will allow for growth, technology transfers and increased global competitiveness within China’s petrochemical companies.
3.4 Regions Differences in China

The magnitude of FDI inflow into each individual province in China differs greatly. The mostly accepted economic geography division in China by the Chinese Ministry of Commerce is to designate the mainland China into four regions: Pearl River Delta, Yangtze Delta, Bohai Rim and Western & Central provinces. These geographic locations are characterised by a significant diversity in economic development, transport infrastructure, industry concentration, and government policy. Location factors such as degree and content of favourable trade policies, or regional investment and industrial policies, vary across types of geographic locations. The intensity of competition is not uniform at regional and segment level. Environment differences lead to the disparity of FDI inflow across regions in China. Regarding to international trade statistics, the majority of export and import activities of China take place in coastal areas. In 2006, exports and imports account for 30% and 28% of total output in coastal areas in that year, while the figures were only 7% and 5% for non-coastal areas (CPCIA, 2006~2008). Figure 3.4 below provides a further comparison between four identified regions with the industry capacity and FIP number side by side. It shows that production capacity of local petrochemical industry is related to the FDI presence in China.

**Figure 3.4 Regional differences of industry output and FIP amount**

- Output% = regional output value / total output value in China
- FIPs% = regional FIPs count / total number of cases 3283
Note: Data covers the three major sectors of petrochemical industry: Oil exploration, Refining, downstream petrochemicals

2. China Yearly Statistic (2007)—production data of petrochemical industry

It can be seen that, the quantity of FIPs in Yangtze Delta ranks first in China, and correspondently, the highest, 44% of total industry capacity is generated in Yangtze Delta. Yangtze River Delta with Shanghai as its kernel, including among others Nanjing, Suzhou, and Ningbo SEZs established since 1985-1988, with major international port facilities at Shanghai, transportation of the Yangtze River Delta roots to major inland provinces. This region embraces a well-established industrial basis of steel, heavy industry, equipment manufacturing and petrochemicals. In recent years, large amount of capital is invested at the petrochemical industry zones in many cities of this region, which become the new base of foreign investment, particularly drive the exploitation of downstream products. 95% of the FIPs production sites re located in industry parks, and the remaining 5% of FIPs choose to invest in other locations for marketing purposes. With high-quality and comprehensive industrial support and linkages, this location offers greater likelihood of projects approval by the authorities, less risk for government policy change, and more convenient location, transportation and supply sources. Concentration of the finest universities, research institutions and MNEs R&D centres makes Yangtze Delta the nation’s top base for chemical research and skilled labour. Yangtze Delta has both vast International cooperation and large internal consumer market for petrochemical products. Local governments have implemented preferential policies to develop industry districts encouraging the agglomeration of both large-scale FIPs and Chinese domestic enterprises.

Pearl River delta covering Guangzhou and Fujian province—consists of a number of the earliest special economic zones (SEZs) established since 1980. SEZs were reformed as early as China started the ‘opening door policy’, and have been recognized as FDI preference location for FIPs because of low institutional barriers. Since the proximity to Hong Kong, Macao and easy access to overseas countries, and the preferential policy to attract foreign investment has promoted the international trade of petrochemical

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products, which has especially attracted more export-oriented FIPs and those strongly dependant on imported raw material. This region has a strong foundation of the petrochemical industry. Foreign firms in these cities or region are located near a number of local large or medium-sized enterprises, and SME of supporting industry. Favourable condition for international trade support this region’s large export to international markets. However, deficiency of natural resources in this region confines the even distribution of FIPs in different positions of the petrochemical value chain.

Bohai Economic Rim includes the economic hinterland surrounding Beijing, and the coastal provinces of Tianjin, Hebei and Shandong which surround the Bohai Sea. It has strong foundation of domestic petrochemical industry with. Its rapid growth in recent years shows the potential enlargement of market capacity for petrochemicals. Comparing with Yangtze Delta and Pearl River Delta, Bohai Rim is endowed with abundant resource of coal, electricity and access to new off-shore oil extraction facilities in the Bohai Bay, which enable the stability of petrochemical industry even under the circumstances of resource stress and raw material appreciation. Contrary to the concentration of foreign capital in Pearl River delta, state-owned capital is overwhelming in this region. These districts have industrialization zones in the planned economic system, and the concentration of government planning is the obvious characteristics. Foreign companies therefore are facing the challenges when competing in this environment. To reduce the threat of competition, FIPs in this region are located near large or medium-sized Chinese enterprises. Shared control between foreign and Chinese companies is predominant choice for FIPs in this location, as this represent combing the location and ownership advantages. By setting up joint ventures with Chinese companies, foreign firms have been able to source raw materials and to access utilities at low cost, enormous pool of labour and consumer market. Initial development of infrastructure and industrial agglomeration

The Central and Western Regions includes five inland autonomous regions (Guangxi, Inner Mongolia, Ningxia, Tibet and Xinjiang) and 7 neighbouring to them provinces (Chongqing, Gansu, Guizhou, Qinghai, Shaanxi, Sichuan and Yunnan). Some tax
incentives and preferential policies, but limited industrialisation is implemented. Comparing with the other locations, this region is characterized by low degree in market economy, industry infrastructure and technological resources.

In all, environment differences between the sub-national regions in China seem to be mostly attributed by the factors of industry cluster, government intervention, cost, and infrastructure.

3.5 Ownership Mode of Petrochemical Foreign-Invested Projects

Along with the development of reform and opening up to the outside world, Chinese petrochemical enterprises are speeding up their use of foreign capital and the property structure is moving towards diversification. According to the Chinese Ministry of Commerce, the institutional arrangements available for foreign invested project in the Chinese oil and petrochemical sector are: wholly owned subsidiary (WOS), equity joint ventures/projects (EJV), and cooperative joint ventures/projects (CJV). The distribution of FIPs by major MNEs is across all modes of entry and all segments of the petrochemical value chain.

The earliest entry mode of petrochemical MNEs was the joint construction with three major petroleum and petrochemical corporations. In recent years, entry modes are diversified. However, the joint venture is still one of most popular approach for initial investments in China because JVs can benefit foreign investors even when they are not required, as the Chinese partner usually has certain strengths, such as central or local government support, brand reputation, land, licenses, distribution, and access to suppliers. These strategic capabilities of the Chinese partner reduce initial costs and improve the foreign investor's chances of success. The increase in production capacity of China Petrochemical Industry is mainly contributed by the direct investments in form of cooperative ventures with foreign investors. In some cases, the Chinese partner in a
JV continues to operate its older facilities, posing a latent threat to its own JV activities. In a recent case, the Total-Sinopec joint venture of downstream retail has created a strong competition for the state-owned Sinopec and other provincial enterprises. Along with the development of the reform, the variation by ownership mode has increased. The emerging trend is for the foreign partner to buy back the locally owned portion of the joint venture, suggesting that a wholly owned approach might have been better. In recent years, foreign petrochemical MNEs become more inclined to choose control or sole ownership in order to bring the subsidiaries in China to their global specialization system and transfer higher technology of products and manufacture. Especially in downstream sectors which are fully open, FIPs controlled or owned by foreign companies are increasing progressively. Another remarkable character is that the modes of entry present a trend of diversification including merger and acquisition. At present two or more foreign companies also build up foreign owned corporations by strategic alliance. As a result, foreign firms that involve a merger, an alliance or a joint venture with local companies, gain competitive advantage and establish a strong market position. In many large-scale projects, especially when the initiators of the project come from different countries, non-corporate form is considered preferential, because this model can allow all investors manage investment in accordance with the own different requirements. In addition, non-corporate structure provides the partners more flexibility in financing, either independently or jointly. The number of participants in an FIP could be only one MNE, or two or more firms from Chinese or foreign origin. It is more likely in the global industries than in other industries that a foreign firm will seek alliance with another foreign firm in an overseas country (Pan and Tse, 1996).

The matrix table 3.5 below demonstrates ownership modes of the major FIPs across various petrochemical segments in China and MNEs’ country of origin. The early entrants have experienced the transformation of the Chinese economy and many of them own more than one facility. The data collected from Chinese statistic authorities and publications consists of 3283 FIPs which are also the validated population for primary research.
Because of short term, high risk and capital intensive nature, collaborative FIPs of oil exploration are usually governed by cooperative or contractual development agreement. Table above indicates that CJV is the most applied structure for crude oil project. This reflects the nature of upstream petrochemical segment and advantages of CJVs. As investments and exchanges tend to be short-term in these projects, flexibility can thereby be attained through switching partners and negotiating new terms of exchange as appropriate. Another advantage of CJV compared to WOSs is that they generally facilitate intangible but critical political alliances as well as more secure access to scarce inputs like crude oil, foreign exchange and expertise. Foreign firms undertaking CJVs in crude oil segment usually do so with local SOEs or other local governmental authorities.

Table 3.5 Ownership modes of the FIPs by industry segment and country of origin

<table>
<thead>
<tr>
<th>CoO</th>
<th>Crude Oil</th>
<th>Refining</th>
<th>downstream</th>
<th>Petro-station</th>
<th>Ownership Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>1.1%</td>
<td>1.6%</td>
<td>4.8%</td>
<td>1.1%</td>
<td>EIV</td>
</tr>
<tr>
<td></td>
<td>1.6%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>CJV</td>
</tr>
<tr>
<td></td>
<td>1.1%</td>
<td>0.0%</td>
<td>8.9%</td>
<td>0.0%</td>
<td>WOS</td>
</tr>
<tr>
<td>European</td>
<td>2.6%</td>
<td>2.6%</td>
<td>7.4%</td>
<td>1.6%</td>
<td>EIV</td>
</tr>
<tr>
<td></td>
<td>10.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>CJV</td>
</tr>
<tr>
<td></td>
<td>1.1%</td>
<td>0.0%</td>
<td>9.5%</td>
<td>0.0%</td>
<td>WOS</td>
</tr>
<tr>
<td>Japanese</td>
<td>1.6%</td>
<td>0.0%</td>
<td>12.2%</td>
<td>0.0%</td>
<td>EIV</td>
</tr>
<tr>
<td></td>
<td>5.8%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>CJV</td>
</tr>
<tr>
<td></td>
<td>2.1%</td>
<td>0.0%</td>
<td>13.7%</td>
<td>0.0%</td>
<td>WOS</td>
</tr>
<tr>
<td>Other Asian countries</td>
<td>0.0%</td>
<td>0.0%</td>
<td>5.6%</td>
<td>0.0%</td>
<td>EIV</td>
</tr>
<tr>
<td></td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>CJV</td>
</tr>
<tr>
<td></td>
<td>0.0%</td>
<td>0.0%</td>
<td>6.2%</td>
<td>0.0%</td>
<td>WOS</td>
</tr>
</tbody>
</table>

Note: 1. Percentages of FIPs are calculated on the basis of selected sample of 3283 FIPs.
2. FIPs are sorted by CoO (U.S., European, Japanese, and Other Asian countries), the industry segment (Crude oil, Refining, Downstream petrochemicals and Petro-station), and the legal status (WOS, EJV, CJV).

2. Enterprises in China (2006), China economic information network
In the oil refining segment, only several large MNEs from U.S. and Europe have engaged in this area and have established EJV with SOEs without exception. One of the earliest FIPs in China was established as a joint venture with Dow (US), and was established through all kinds of diplomatic negotiations. Following Dow's investment in the 1990s into the oil refining segment, ExxonMobil and Saudi Aramco also took lead in cooperation with Sinopec to build a large integration project involving oil refining and finished oil distribution located in the South Coast City. FIPs of refining are still scarce, compared with the number of FIPs in other segments. The Chinese government still places some requirements on FIPs in the field of oil refining, such as the establishment of Sino-foreign joint ventures, the use of advanced technology, and the capability to supply raw materials. The high level of capital intensity for investment in the refining segment demands great resource commitment and increases business and political risk (Chen and Hu, 2002), which induces the need by MNEs to seek ownership advantages, which is a barrier for many potential investors. The competitive threat for FIPs from SOEs' monopoly or oligopoly in crude oil resource is very high in the refining industry. Hence, spreading the risk through JVs with these SOEs is a safer choice for the MNEs.

A significant difference of preference for ownership mode can be found in downstream petrochemical segment as indicated in Table 3.5. In terms of production process and product feature, the downstream petrochemical sector especially fine chemicals have lower capital intensity but higher product diversification, and higher value-added based on product innovations. The market conditions for this segment are represented by openness and fierce competition. Sole control structure has been preferred by MNEs in this segment in order to protect technology and know-how. Nevertheless, FIPs are established mostly by shared ownership which could be explained by the industry competition and the institutional barriers.

FIPs in retail of finish oil products are an emerging segment in China and exhibits more diversified strategies. Since the elimination of market restriction in wholesale and retail of petroleum in 2004, this segment has become the focus of interest by Western petrochemical companies. However, foreign companies entering this segment face
intensive competition from SOEs. In response to this situation, FIPs have taken three main strategies: establishment of equity joint ventures with Sinopec and CNPC to build gas stations; mergers or acquisitions of local private gas stations; and strategic alliance with other companies. For example, in 2004, Shell’s and BP’s EJV subsidiaries acquired and formed FIPs with 1500 petrol station and sales networks. BP strengthened its market position through strategic alliance with a Chinese automobile manufacturer Dongfeng, signing a 50/50 JV contract and the car manufacturer committed to recommend BP’s oil brand to the customers. ExxonMobil and Total ELF also set up new subsidiaries with Chinese domestic petrochemical giants to construct retail networks of refined oil products. Shell is another example of carrying out this expansion strategy. In 2005 and 2006, Shell’s projects in oil retail were accepted by the government which included an EJV with a Chinese private firm and a sole venture in Shandong province. By 2006, Shell had established more than 70 own-brand gas stations in three metropolitan areas (www.stats.cpcia.cn).

The distribution of FIPs in above table does not show a significant difference of ownership mode by CoO of MNEs. FIPs for which foreigners do not have a controlling interest (37% of the total) tend to be those contracted before the liberalization of regulations for entrance restriction and prohibiting majority ownership. WOSs are increasing year by year. JVs and ‘Greenfield’ investments by foreign firms have been bundled together with Chinese partners to establish new enterprises as a leading entity for the FIP. Subsequently, FIPs have been able to adopt a more flexible approach to establish more independent partnerships with Chinese enterprises. Since China’s WTO entry and the government’s relaxation of investment regulations, foreign investors have been able to establish more wholly owned projects.

3.6 Conclusion

This chapter has discussed the business environment in China confronting petrochemical MNEs, as well as their presence and strategies under this environment. FDI results in extremely increasing production capacity, brings the advanced technology and fierce
competition to China’s petrochemical industry. The real context of Chinese petrochemical industry detects that MNEs’ strategies have been diversities under such changing business and institutional environment in recent years, particularly, the increasing of fully controlled subsidiaries, emerging of Japan and Asian chemical MNEs, and disparity of industrial development across regions. Moreover, it can be seen that MNEs’ activities also varies according to industry segment, the actual situation of the project initiators, the business environment in the host country or the region where the project locates, financial capabilities of the project initiators, tax incentives and other regulatory factors. Therefore, it is important to grasp the role of these changes and differences on the formation of inter-firm linkages in China.
CHAPTER FOUR
RESEARCH METHODOLOGY AND DESIGN

This chapter has the following objectives: review methodologies used in previous 'local linkages' studies; to discuss the selection of philosophical approach for this empirical research; to explain data collection methods and procedure; to define the research population and sampling strategy; to introduce the design of data collection tool; to present the design and operationalization of variables.

4.1 Review of Previously Used Methodologies

Before going to the specific procedure and method, this section gives a review on the most common methodology used in existing studies. Current studies of local linkages and knowledge transfer are of variety in methodologies, but also suffer from methodological shortcomings. The concept of local linkages was ambiguous and had different implications in previous studies. As the consequence, the methodologies and measurement of local linkages varies between each other. Many studies of local linkages in these researches are actually based on the same measurement although employed several interpretations incorporating traditional concerns with relationship between MNEs and firms in host regions as well as issues of interest such as spillover, local embeddedness, and global supply chain. Table 4.1 categories methodologies used in the relative studies and correspondent measurements for local linkage indicators. Studies on linkages and knowledge transfer specifically, are of three major types: firm-level panel data; case studies using interviews with firms or industry which offer the description of particular foreign firm(s), industry as whole or inter-firm relationships; surveys conducted directly with a large number of MNEs or their subsidiaries.
Table 4.1  Review of methodologies in local linkage studies

<table>
<thead>
<tr>
<th>Indicator/Measurement of local linkages</th>
<th>Method</th>
<th>Methodologies</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivity of domestic firm; Job creation; Extent of local purchase</td>
<td>Panel data and econometric approach</td>
<td>Use published firm database</td>
<td>Blalock &amp; Gertler (2003); Görg &amp; Ruane (1997); Javorcik (2004); Javorcik &amp; Spatareanu (2003); Barrell &amp; Pain (1999); Fuentes et al. (1993); Barkley &amp; McNamara (1994); Collis et al. (1994); Barrow &amp; Hall (1995); Poon (1996); Hood and Taggart (1997); Belderbos et al. (2001)</td>
</tr>
<tr>
<td>Local sourcing ratio, local sale ratio; number of relationships; types of transferring knowledge</td>
<td>Case study</td>
<td>Small number of firm interviews, specific industry data</td>
<td>Lim &amp; Fong (1982); Ivarsson &amp; Alvstam (2005); Awuah (1997); Kelegama &amp; Foley (1999); Aya (2004); Crone (2000)</td>
</tr>
<tr>
<td>Intensity/Extent of vertical linkage (Measured by sourcing and sale ratio in the local economy); Number of inter-firm relationships</td>
<td>Firm-level data survey</td>
<td>Published firm-level data, large amount of questionnaire survey</td>
<td>Crone &amp; Roper (2001); Driffield &amp; Noor (1999); Lorentzen et al. (2003); Cantwell &amp; Iguchi (2005); Dries &amp; Swinnen (2004); Batra &amp; Tan (2002); Giroud (2003); Giroud &amp; Mirze (2006)</td>
</tr>
</tbody>
</table>

All these approaches have their merits and demerits and may be seen as being mutually supportive, thus there is advantage for combining approaches. Econometric study is the earliest and very important method for both linkage and knowledge transfer. But for a long time, studies have been usually limited to using panel data and input and output tables, which are more capable to predicate the outcome evidence of local linkages and technology transfer in country and industry level. These studies do not include perceptual measures that enable a much more in-depth view of the influence of firm, organizational and environmental characteristics on the occurrence of linkage effects and spillover. Where firm-level linkages are the focus, in-depth case studies of companies or industries provide some resolution to the limitations of aggregate data studies by offering valuable insights as to the types of FDI, linkages and even the extent of upgrading of domestic firms (Barrow and Hall, 1995, Brown, 1998, Dunning, 1998a, Ivarsson and Alvstam, 2004). Case studies enrich the econometric approach and examine conclusions in a specific regional or industry setting, because they could describe firms in depth and understand the circumstances and depth of linkages and
relationships between the foreign subsidiary and local firms. Current studies that consider the local network created by the MNEs in the emerging economies usually adopt the case study approach. Furthermore, some variables are difficult to quantify for econometric purposes, and these case studies are often based on single case or small samples which are less capable to singularly explore factors. As a more quantitative research design, questionnaire surveys of larger sample facilitate the generalization and validation of the findings. However, surveys fall short of providing underlined explanation for their results.

The relationship between the nature of FDI, the resources that accompany it and the outcomes of inter-firm linkages has received insufficient empirical attention, partly because of the difficulties in measuring technology transfer and spillover. And because of measurement difficulties, larger past samples tended to focus on the quantity or number of linkages, rather than their quality or potential for beneficial spillovers. It suggests that empirical findings need to be validated using more sophisticated measures, especially for local linkages. Existing research have not distinguished the actual inter-firm linkage itself and potential effects of the linkages on, for example, economic development in the same or related sectors. There have been many empirical studies examining the extent of inter-firm linkages between MNEs and local firms. Most studies conducted by international business scholars analyzing primarily backward linkages, evaluate them by the extent of local sourcing of foreign subsidiaries calculated as the percentage of total raw material and components sourced in the host country economy using firm-level data collected through surveys. This measurement is essentially the concept of local sourcing as defined by the United Nations (UNCTAD, 2001). In a variety of case studies, measurement on backward linkage also includes the number of relationships with suppliers and the extent of reliance on local firms rather than overseas firms for sourcing of raw material and equipment over a twelve-month period. Backward linkages are more frequently measured by the resulting impacts on demand, employment or export competitiveness.
Above all, in order to understand how and to what extent spillover may create, this research changes the route to examine the mechanisms through which such spillovers occur at the firm level, which are the inter-firm linkages that form between foreign and local firms.

4.2 Comparative Analysis Technique for This Research

Triangulation method is adopted for the research analysis which consists of a series of case studies and statistical models, which will determine the tool of data collection respectively. There both advantages and disadvantages exist in respective analysis methods. Given critical matters using these methods by previous researchers, this research provides definitions and solutions for effective use of these two methods.

4.2.1 Triangulation method

Triangulation is a strategy of data, investigator, theory and methods triangulation (Denzin, 2006). The use of multiple methods within a single research is one of the potential research strategies open to a researcher. Such an application is described as one of convergent methodology, multi-method/trait, convergent validation or, what has been called 'triangulation' (Jick, 1979).

This strategy firstly relates to the multi-level research approach. FDI inflow analysis at the country level indicates the time points of policy change. At industry level this research is interested in how external factors influence foreign invested firms’ resource dependence. At firm level this research is interested in internal characteristic of firm in their linkages pattern with local firms. Therefore, this study embodies a multi-level analysis approach to answer the research questions. The qualitative and quantitative research strategy leads to different approach to collect data. The first approach uses a series of interviews to obtain more in-depth data to be analysed in a qualitative way following a comparative case study, and the second strategy is that of a mail survey to obtain a larger number of responses. The semi-structured interviews also allow
exploring the issues within each relationship so that issues not identified within the literature. Both approaches then converge into a mixed methodology approach and the final results are reinforced by both paradigms in future section. The secondary data collected from government authority, publication and research report will enable analysis on key context environment including foreign firms' activities and policy intervention. It also helps to narrow down the research propositions by providing the necessary information about target country and industry.

Moreover, this strategy represents qualitative and quantitative methods that are viewed as complementary rather than as rival camps. Early attempts to enhance methodological pluralism were made by researchers in the social sciences with a quantitative background (Campbell and Fiske, 1959; Abernethy et. al., 1999), emphasizing the validity problems stemming from a reliance on single-method measures of concepts (Bryman, 1992). This impetus resulted in various combinations of research strategies, and different types were later identified. Despite that fact that most researches favour the use of only on paradigm that is either the qualitative or the quantitative paradigm, several authors have tried to show the advantages of using a combination of both methods (e.g. Greene et. al., 1989; Creswell, 1994; Saunders et. al., 2000). Several advantages exist for using the triangulation method. According to Jick (1979), a thread linking all of the benefits from triangulation is the important part played by qualitative method in triangulation. A qualitative research methodology is used because it enabled the researchers to gain access to detailed, contextual information about specific instances of network relationship (Easterby-Smith et. al., 1991; Flick, 1998; Strauss and Corbin, 1996). Triangulation provides confirmation and completeness. Triangulation is not simply combining different types of data, but it attempts to relate the two types of information so as to leave the validity of each type of information intact. The use of triangulation allows researchers to capture a more complete, holistic and contextual portrayal and reveal the varied dimensions of a given phenomena, with each source contributing an additional piece to the puzzle. In using triangulation, bias can be minimized and validity enhanced. Neither the qualitative nor the quantitative method alone could yield the results of the two combined. Both quantitative and qualitative
research designs seek reliable and valid results. Data that are consistent or stable as indicated by the researcher's ability to replicate the findings is of major concern in the quantitative arena, while validity of the qualitative findings are paramount so that data are representative of a true and full picture of constructs under investigation. By combining methods, advantages of each methodology complements the other making a stronger research design with result of more valid and reliable findings. The inadequacies of individual methods are minimized and more threats to internal validity are realized and addressed.

In contrast to this endorsement of quantitative rigour, a growing number of researchers have recommended qualitative studies, mainly case studies based on data collecting from in-depth interviews. Their strength is in the ability to examine dynamic, context-dependent and interactive phenomena which are the subject of international business research (e.g. Parkhe, 1993; Boyacigiller and Adler, 1991). The drawback of these cases studies is that they rarely offer quantitative evaluation of linkages and therefore make it difficult to generalise results. However, case study research can include quantitative evidence, relies on multiple sources of evidence and benefits from the prior development of theoretical propositions. Yin (2002) notes that case studies should not be confused with qualitative research and points out that they can be based on any mix of quantitative and qualitative evidence. The limited interest in methodological techniques for international business research has largely been confined to quantitative methods such as standardised mail surveys (Harzing, 1997). The assumption made by the authors is that although the complexity of conducting international business research has led to a proliferation of conceptual and qualitative studies---there is hope that this situation may be remedied by the development of more sophisticated scaling and multivariate techniques (Cavusgil and Das, 1997).

4.2.2 Application of a case study

Case studies can be used to accomplish various aims: both generate and test propositions (Flyvbjerg, 2006). Yin (1989) separates exploratory, descriptive and explanatory cases. Eisenhardt (1989) acknowledges description but stresses the role of cases in generating
and, also, testing a theory. Rather than using large samples and following a rigid protocol to examine a limited number of variables, case study methods involve an in-depth, longitudinal examination of a single instance or event (Easton, 1995). This approach was used to collect comprehensive and holistic data (Yin, 1994; Eisenhardt, 1989) about firms which have internationalized their operations over time. Compared to a structured statistical approach, in-depth research methods allow researchers to observe the causal interconnection between actual properties and people within an actual setting, probe the dialectical and dynamic process of the phenomena under investigation, better grasp its complexity and suggest possible new theoretical and generalizable principles (Stoecker, 1991). In practical conditions, companies are becoming even more reluctant to complete questionnaires due to increased workloads, company policies, and the proliferation of survey requests Parente and Gattiker (2004). Therefore a smaller sample with quality information is more feasible for this research under tight schedule.

Yin (2002) also emphasizes the existence of both single- and multiple-case studies. A single-case study is an appropriate design for network research in many situations, for example, the objective is providing holistic descriptions of contemporary business networks to learn about their nature, management and evolution. Nevertheless, multiple-case designs that allow case comparisons are preferred in theory-generating case studies. The evidence from multiple cases is often considered more compelling than a single case and the overall study is, therefore, regarded as more robust (Herriott and Firestone, 1983). Eisenhardt’s (1989) approach is adopted to theory development from cases, grounding in the literature and approaching case companies with tentative propositions that were refined iteratively and strengthened throughout the research process. The analysis focuses on the patterns within and across cases (Huberman and Miles, 2002), and the insights into theory that this presents. As Eisenhardt (1989) notes, the within-case analysis ‘typically involves detailed case study write-ups ... are often pure descriptions, but ... are central to the generation of insight’; the analysis within each case consists of the distillation of rich data from multiple sources into a structured analytical narrative (Huberman and Miles, 2002) that underpins cross-case analysis. While by moving beyond this to link key aspects of the within-case scenarios to theory researchers
could reserve full integration of the results with proposed framework for the cross-case
discussion, to ‘maintain the independence of the replication logic’ within each case
(Brown and Eisenhardt, 1997). By comparing cases, one can establish the range of
generality of a finding or explanation and, at the same time, pin down the conditions
under which that finding will occur (Miles and Huberman, 1994). There is thus much
potential for both greater explanatory power and greater generalization than a single-
case study can deliver.

The case study is one of several ways of doing social science research. Behavioural
research in the fields of logistics and supply chain management has been characterized
by an over-reliance on the use of the survey methodology, and to lesser extent case
studies (Carter and Ellram, 2003; Wacker, 1998). In the management and marketing
literature, theory generation from case study evidence has been the most discussed type
of case research (e.g., Eisenhardt, 1989; Yin, 2002; Miles and Huberman, 1994).

Network research like this one, is defined as an intensive study of one or a small number
of business networks, where multiple sources of evidence are used to develop a holistic
description of the network and where the network refers to a set of companies (or
organizations) connected to each other for the purpose of doing business (Halinen and
Tömöroos, 2005). Network research is highly contextual in nature, given its ‘embedded’
design incorporating multiple levels of analysis: firm actor, network and country
environment. In light of these specifications, the research strategy for this study, a case
study, is therefore chosen because it is well suited to understanding and explains a
phenomenon (i.e. the local network of a foreign subsidiary) in its real-life context (Yin,
2003). External connections of the foreign subsidiary in empirical investigation involve
the presence of more than a single local firm and coupled with potentially unstable and
disparity environment of particular location. Therefore it is types of organization whose
inter-firm linkage networks are expect to be relatively complex.

Case study method is therefore be able to obtain more in-depth information about the
local relationships of the foreign subsidiary, to identify hidden or new dimensions that
emerged in the different interviews and to compare them, to be able to describe other aspects of the local linkages, and to be able to build methodology best fitted to the particular topic under research through the quantitative analysis of questionnaires. In this research, case studies are used as a potential strategy to enable inductive and rich description for network linkages of cases and to test theoretical expectations in terms of linkage differences across different settings. This research thus applies multi-case studies in order to conduct groups of comparisons. They provide a systematic way of looking at activities, collecting data, analyzing information, and reporting the results. As a result the researcher may gain a sharpened understanding of how the instance happened as it did, and what might become important to look at more extensively in future research. It allows the study of a contemporary phenomenon, which is difficult to separate from its context, but necessary to study within it to understand the dynamics involved in the setting.

Despite its undeniable strength in the study of business networks, case study method poses various challenges. Easton (1995), Halinen and Törnroos (2005) have provided an illuminating overview of the most evident problems network researchers face when conducting case studies. They bring up the connectedness of networks and the problems of representative and choice of sampling unit that it creates and also draw attention to the nature of networks as an interdisciplinary and complex field of study and emphasizes the necessity of taking the temporal dimension into consideration. Very much in line with each other, four major challenges for network case research are distinguished: Boundaries, complexity, time dimension and case comparison. Solutions facing these issues are defined as below.

**Network boundaries**

The first challenge in studying network activities is adequately specifying the boundaries of the network. The problem of network boundaries relates to the difficulty of separating the content and context of a business network (Easton, 1995). Different criteria have been used to draw network boundaries, such as technology, country, product type or attributes of the actors and the types of relations between them (e.g., Mattsson 1998,
Rowley et. al. 2000). There is no formal solution to this problem, because a basic feature of networks is that they have no objective boundaries (Forsgren and Johanson, 1992). The primary guideline to be used in the definition of network boundaries is the content of the research problem (Halinen and Törnroos, 2005). In this research, two criteria are adopted to defined network boundary in order to control for the contextual factors and consequently be able to focus on linkages of firms potentially in the same economic environment. The first criterion is based on the geographical context in which the network operates and is thus defined by its spatial boundaries. This research studies foreign firms operating in Mainland China and their linkages within Mainland China, as compared in some dimension with linkages overseas. The second criterion refers to the scope of network connections. This network research span as how local linkages defined at the beginning of the thesis, which is the external non-corporate relationships of the MNE in the host country. This indicates the business and technology exchange relationships between foreign and local firms or organizations eliminating institutional and social connections in market surrounding the focal organization. Therefore, to see what important factors have developed and formed present linkage portrays, the perspective of individual actor centrality rather than structural configuration is adopted in order to delimit the case networks. The definition of network context or relation scope as a perception of an actor means that the network boundaries are defined through the informants interviewed in the empirical study. Therefore, those persons in the chosen set of companies who are found to be able to answer central questions as key informants are likely to set the limits to the studied network.

**Network complexity**

The second challenge, network complexity poses for a researcher can be expressed in the form of a question: How should one design and conduct the study so that this basic network characteristic will be revealed rather than hidden (Halinen and Törnroos, 2005)? Definitions of networks vary in their degree of simplicity or complexity corresponding to the different contexts of inter-firms network (Alter and Hage, 1993). As defined through the ARA model of business networks (Håkansson and Johanson, 1992), the perceived context includes the actors and their relationships that the actor regards as
relevant, the activities performed in the network and the resources used and created within it. The problem of complexity is a many-dimensional issue, such as complexity in terms of their structure, geographic level, and network embeddedness which create important problems for a researcher. Through business actors, their bonds, activity links and resource ties, networks are connected, for instance, to various geographical levels from global to local. As case study in this research is across locations within a country, the cultural and political dimension are mainly connected to national level aspect, whereas technological, industrial, and regulatory context are dealt with in more regional ways. Based on the network boundary, complexity issue concerns the interplay between actor complexity and relationship complexity, including how individuals’ cognitions of networks reflect not just the current state of the network but also the memories of actors who are no longer physically present. To achieve this, content of local linkages which is organized as network relations in this research refer both to networks of market transactions and to networks of formal cooperative relationships. In addition, contacts to more than one informant in order to have good access to the each type of relationships and the case networks, as well as close and direct relationships between researchers and practitioners, are needed in this research.

The effect of time in network linkages research

Easton (1995) puts forth two main reasons for bring about time problem in network research. The first is that the unit of analysis that is, by its very nature, dynamic and susceptible to change; In addition, the explanatory power of industrial network approach comes into play when this approach is used to explain the changes that have occurred in particular networks. The inclusion of case studies from different time periods thus enables the analysis of patterns of complex phenomena over time. The current research moves forward by incorporating firm respondents’ memories and knowledge in order to capture the possible change of local linkages. As complementary to the phenomenon at present point, time dimension could be included to find out external and internal trends which may play an important role in how the network will change.
Case comparisons

The idea of case comparisons is based on replication logic, not on sampling and statistical representativeness (Yin, 1989). Each case must be selected so that it either predicts similar results for predictable reasons or produces contrary results for predictable reasons (ibid). But it is still very problematic issue in network research. As a result of context specificity and historical background, each network case is somewhat unique and thereby difficult to compare with others. To increase the potential of case comparison, using the same type of informants across cases is crucial in finding comparable data concerning business networks and data that emanate from similar types of sources and positions in the studied firms (Halinen and Törnroos, 2005). Using the ideas of multiple-case designs, the cases chosen in this research are conducted in such a way that they are selected by several identical dimensions (i.e. industry segment, age, size, R&D intensity) and subsequently comparable along several dimension (i.e. country of origin, regional/city, type of ownership). It is a condition to be faced that petrochemical projects or enterprise are comparatively large scale production and capital intensive, it is not likely neither for a MNE to set up two or more projects of same product in different locations, nor for two large joint ventures to be concurrence in the same city. When investigating variance at differentiated conditions, the representativeness of cases is another issue in comparison results. However, extreme or atypical cases rather than average cases could still reveal important information because they activate more basic mechanisms and more actors in the situation studied.

In this research, the 'abductive' interplay between theory and data (Dubois and Gadde, 2002) formed the basis for the further data analysis which was achieved by constructing a cross-case matrix using the factor categories developed in the conceptual framework. In the next section, the evidence will be outlined from the cases concerning the key constructs in the conceptual framework. In presenting the case findings, the next section focus on the evidence for a cross-case analysis rather than including detailed narratives of each individual case (a form of reporting discussed by Yin, 2003). Delimiting the spatial and temporal boundaries of a network is a well-known challenge (Dubois and Gadde, 2002), and case study in this research was done in such a way to concentrates on
the focal network members rather than the entire local network. In addition, from both an understanding-oriented and an action-oriented perspective, it is often more important to clarify the deeper causes behind a given problem and its consequences than to describe the symptoms of the problem and how frequently they occur. Therefore, in order to make comparison feasible in this research, a somewhat more flexible attitude towards comparisons should be adopted when comparing case networks.

4.2.3 Application of statistic models

Although case studies methodology represents an advance, by providing an opportunity to study in-depth characteristics and process of inter-firm relationships but it still dispense causality for investigating the influential factors, statistical models therefore could offer a more comprehensive method to research the link between independent factors, local linkages extent and technology transfer degree. Moreover, mail questionnaire could ensure broader spread of cases in host country.

Survey data can thus interact with case-studies of individual firms. In this sense, this research follow more closely a between-methods strategy, with a mixed methodology approach combined with the two-phase approach, that is qualitative data obtained through the semi-structured interviews are first analyzed independently, leading on to the quantitative analysis of the questionnaires in an independent section. The clear advantage of quantitative design is that of credibility of results through a large number of responses organized in a structured way. The most popular research strategy in business and management research is the survey method. This strategy allows the gathering of large amounts of data, and it is highly economical. Data are collected by means of a structured questionnaire, and the techniques are highly standardized. However, the data collected are not as wide ranging as those collected by qualitative research methods. There is a limit to the number of questions that questionnaires can obtain, and the biggest drawback of a survey method is the capacity to do it.

Methodologically, this research seeks to use regression test to examine the statistical relationships between the linkage extent and the dependent variables by controlling for
4.3 Population and Sampling Methods

Several factors were considered to choose this sampling method for this research. When selecting a case for a case study, researchers often use information-oriented sampling, as opposed to random sampling (Flyvbjerg, 2006). Selection of an appropriate population controls extraneous variation and helps to define the limits for generalisability, e.g. size, environment, industry, and to clarify the domain (Eisenhardt, 1989). Selection of comparable cases is made on the basis of purposeful sampling, with the aim of capturing different networks while also limiting extraneous variation (ibid). In this research, time and financial constrains are critical in conducting interviews and sending a large number of questionnaire. Second, low response rate are very likely to arise, especially in the context of China, hence the number of variables to be investigated needs to be controlled. By reviewing findings in previous studies, variables are selected for this research as they have ambiguous results. Therefore, in order to maintain the feasibility of case comparison and reduce the overlap influence created by impurity independent variables, the cases decided to be selected by controlling at same category of size, industry sector, age. Without controlling for them, results on other variables to be studied may appear to be less independent than they otherwise would be. Sampled foreign subsidiaries will vary by country of origin of parent MNE, ownership type, subsidiary age and location. The controlling criterions for research population are explained specifically below.

The population is firstly bounded into manufacturing ventures to minimize extraneous variation (Eisenhardt, 1989) that might be derived from differences between the service and manufacturing sectors. The two sectors differ greatly in the sources, rates and directions of their technological activities (Patel et. al., 1996). The value chain as both a concept and tool has been used to understand and analyze industries (Porter, 1985). It has proved a very useful mechanism for portraying the chained linkage of activities that exist in the physical world within traditional industries, and particularly manufacturing
and also framed the value network. Given their products in different position of industrial chain, the value network of focal enterprises might form different configurations. The petrochemicals industry value chain in China is composed of all the value-creating activities within the industry, beginning with the first step in cracking ethylene and other basic petrochemicals derived from oil, transforming to intermediates and downstream material, ending with the completed delivery of courses and related services. Furthermore, for ease of the research process and the effect of independent variables on sample size, the research target one particular section in petrochemical industry: downstream chemicals sector. The reason behind the choice is the discrepancy between the sectors in petrochemical industry. This segment is the end of the petrochemical industry but displayed high density of FDI than upstream. From a methodological point of view, it was the intention to obtain as many cases as possible form one particular sector for the robustness of the result. It argued that a higher response rate within one particular sector leads to validation of the results through the sheer number of respondents. Moreover, it is often preferable to target a smaller sample that allows the researcher to spend more time and effort on this smaller sample, and this method generally increases the chance of a better response rate (Dillman, 1978).

In previous studies, size factor showed a significant role in explaining foreign firm’s local activities and effect on host country. Similarity on the size of comparative projects is emphasized to eliminate its influence on the local linkage. It is aware that FDI projects in Chinese petrochemical industry collected are greatly varies from super large integrated projects to small chemical processing enterprises. In fact, foreign investment in China’s Petrochemical industry has been led by large and medium sized companies since the open policy. Currently, no matter on the aspects of capital amount and market access, the ones possess distinctive advantages are foreign large oil and petrochemical companies of the world’s Top 500, worldwide-known specialized chemical companies, and major oil and petrochemical companies from South Korea and Japan. Small business may have fewer strategic options, in terms of markets served and product range for examples, and they have much less complex strategic decision-making than larger organizations (Jocumsen, 2004). In this research, the population is therefore biased.
toward medium-sized firms. The number of medium-sized foreign enterprises is the largest, and it is believed that they have certain strategic sophistication and similarity in strategies pursued. Enterprise size as defined by Chinese national bureau of statistic of China (NBSCa, 2006) in terms of Kiloton of production capacity is adopted as division standard to measure the size of petrochemical projects. According to this standard, petrochemical manufacturing enterprises or projects are classified in to Extra Large, Large, Medium and Small scale.

Regarding to the age of cases, selection allowed a gap of five years after the introduction of economic open policy in China which for foreign subsidiaries and local enterprises to adapt to changed conditions. On the other hand, the FDI projects have to be in operation for a period of time so that the built and developed linkages are available and partners in the joint venture are long-established enterprises with well-established corporate cultures, infrastructures and management practices. Consequently, establishment during period of 1985~2004 is defined for selecting FDI projects.

Besides, the definition of foreign subsidiary in terms of foreign share needs precision too, since the behaviour of a foreign firm in a host country is expected to differ according to its ownership structure (Kumar, 1990). Take into account the reasonable influence power of MNE parent firm, a foreign control at minimum of 25% shares (ibid) held by the foreign parent firm is adopted in this research. Moreover, this research will not investigate the cooperative joint ventures.

Based on these factors, the list of companies population was mainly compiled from comprehensive business directories of FDI projects in petrochemical industry including both public authority and private company, i.e. Emage Research (2006, 2007), CEIN (2004) and DQC (2004). These directories are managed by subscription or functioned as search engine on a few variables (ownership type, production capacity, location, time of registration, industry segment). Based on these sources, the final population frame contains 302 government-approved FDI equity-based projects that are currently in operations. It is a poll of medium-sized foreign-invested enterprises dispersed over nine
provinces and municipality in China. Considering the time and financial cost of travel, the interviews were conducted in several representative city of each location category, i.e. Shanghai, Tianjin, Jilin, Baoding, Shenzhen and Guangzhou. Therefore, a smaller population is created for choosing the cases for interview, consisting 140 firms.

4.4 Questionnaire Design and Pilot Study

In this research, central strategy is that of a triangulation which use a questionnaire administered in two different ways. This approach involves using more than one research method or data collection technique, because each addresses a different dimension of the topic. It would be not appropriate to identify that the analysis of the questionnaire is to be clearly divided between a quantitative analysis of the mail survey results and a qualitative analysis of the semi-structured interviews. In fact, some of the questions include in the questionnaire are qualitative in nature, since they are open-ended questions, and are coded for analysis purposed after receiving responses. Therefore some of the variables used in the quantitative analysis are qualitative in nature.

The first step in the design of the questionnaire is to identify the main groups of variables to be studied following the research objectives developed earlier. Additional questions are included in order to obtain a fuller picture of the local linkages between foreign subsidiaries and their local actors. Samples of existing questionnaires in previous researches are important source on the activities of foreign firms in a host country are referred (e.g. Hansen, 2006). Some questions of this research are similar to those used in these studies. Additional material is used, such as specialised books on human resources, specialised technology transfer publications in petrochemical industry and on production operation management.

The interview questionnaire consists of two main parts. The first part of the questionnaire includes the profile of interviewed company, especially the competitive advantage in the short term and in the long term, the property structure of the enterprise, the output, the capital stock, the number of employees, the research and development
(R&D) activity, the size of the company in produce capacity, location, major products, and age. The last question in the first section regards to the major locational factors motivating respondent firms' local networking (also understand as major benefits obtained from local networks). Based on these answers, reconstructed factors are provided in mail questionnaire followed by scale options of importance. Questions related to the demographic profile are very similar in interview and mail questionnaires. The only difference between the two versions is that structured answering options are provided in mail questionnaire.

The second part of interview questionnaire is the set of semi-structured questions starting with more general questions or topics and are not given the multiple answer choices as mail respondents are. These questions aim to observe the holistic image of local linkages, including the types of local linkages they have; who the actors are; content of relationship; and how each type of linkage occurs and managed, and overall scale of local linkages. Information obtained from these questions was more complex and ambiguous because there were always multiple answers. Therefore, interviewees will then be asked about all the questions regarding to any specific relationship. Interviewees usually provide 3 to 5 major local network actors, including domestic and foreign firms. Furthermore, the managers were asked to describe and assess the characteristics of these relationships that they considered important. Although the companies were not reluctant to give the identity of these companies, provided locations could facilitate a greater illustrate on geographic distribution of these firms in China. The choice of which subsidiary relationships to study was a critical issue. First, it has to limit the number of relationships to be investigated, as it would be an insurmountable task to gather information about all relationships that a subsidiary has, especially as the study required face-to-face interviews with managers of different nationality. These interviews insight was obtained into interviewees' perceptions, attitudes and beliefs about local relationships. The interviewees' discourses ranged from those that covered a wide array of connections and those which focused tightly on specific areas, though there were many similarities among them all. They allowed comparison between how firms viewed and managed their relationships with other entities and the importance that
was placed on these linkages. However, some interviewees are able to converse about and describe their relationships with multiple actors within the industry, whereas others could not or do not. Thus for practical and analytical reasons, semi-structured interviews limited investigation of subsidiary embeddedness to concern relatively few of each subsidiary’s customers and suppliers relating to its most important field of business.

For the mail survey, a more simplistic choice questionnaire (Appendix 3) was sent to 302 companies. The survey is based on a questionnaire of approximately 17 questions. In order to maximise response efficiency, the layout of mailing questionnaire was designed to short and looked easy to answer. The mail questionnaire was revised based on the characteristics of local linkages explored in interviews. Questions in the mail version of questionnaire are provided with multiple or single choices of answers. Instead of questions on specific relationship, mail questionnaire focus on ‘overall’ perspective of foreign firms’ local linkages. Relative definitions and answering guideline were provided in separately attached pages. Official letter from researcher’s institution is attached on the first page of the questionnaire. Additionally, the questionnaire design emphasized the use of stamped return envelopes, concise layout, stress of anonymity and confidentiality. The participants were provided a copy of the survey results on demand. All questionnaires received were firstly coded and then input into SPSS (version 16).

Because of geographical distance, a preliminary pilot study before sending questionnaires is firstly carried out with two managers in two domestic companies. Ten companies are chosen at random for the pilot sample. These companies are contacted to obtain the appropriate contact name and are sent the questionnaires addressed to these purchasing, operation or marketing manager. Six questionnaires are returned after the enquiry letter with initial questionnaire. Afterwards, each question in the questionnaire is discussed over phone so as to make sure the questions are understood, and to identify the variety of answers that could arise. Some modifications are made to the questionnaire, some questions are reformulated, some abandoned and the questionnaire is compressed from ten to three double-sided pages, with two columns on each page. At the end of this procedure, particular attention is given so that questions are uniformly understood,
useful, and that the structure of the questionnaire was both logical and pleasant for the respondent to follow. The pilot results suggested that MNEs were changing their purchasing and production strategies in the direction of globalization, i.e., the adoption of global sourcing policy and the integration of China into their global production network. This may create substantial pressure on suppliers, and resulted in changes in the inter-firm relationship.

4.5 Data Collection Methods

Following Creswell et. al. (2003), this research adopts multi-method research strategy combining qualitative data collection (and/or analysis) with quantitative data collection (and/or analysis) in a single study. Although each technique produces different empirical data, data collected from one empirical technique can complement data collected from another technique. Collecting different kinds of data by different methods from different sources provides a wider range of coverage that may result in a fuller picture of the unit under study than would have been achieved otherwise (Bonoma, 1985). Yin (1994) outlines primary sources of evidence and for the purpose of this research, the method or major sources of evidence are questionnaires, interviews, documents, and archival records. The data may be collected concurrently or sequentially and combined at one or more stages in the research process. Most previous studies attempt to quantify the extent of local sourcing by foreign affiliates, but neither investigates the types of products being sourced, nor the extent to which the firms exchange resources and knowledge in the process of these transactions. In this way this research collects both the quantity and quality data. Furthermore, both case studies and statistical tool are used for complementary analysis.

Data collection could be divided into two sequential main stages. First one is at preliminary stage, which includes obtaining document for industry context analysis and selecting comparable cases. The next one is the main field work conducted by face-to-face interviews. The data collected at the first stage are secondary from websites and organizations, which at the second stage are mainly primary from interview and
secondary also from gathering published project or company information. The research design, which entailed a two-stage process involving two separate data collection phases, is explained and an overview is given of the methodology and methods used. The data collection and analysis procedures associated with each stage are discussed. The main source of data collection for each case was in-depth interviews, supplemented by project documentation made available by the organizations (such as the minutes of meetings and project appraisal documents)

In order to estimate the time scale, firstly, the time for getting access to interviewee needs to be considered. Concerning the cost and the time of travel, appointments will be managed to obtain over the phone. Then, it needs to consider the time to search for specific informants. As mentioned before, besides the senior board member, the interviews will extend to department managers as needed. It might take more time to locate informants than to interview them. Moreover, it may be necessary to visit informants more than once for follow-up. Since the interviewee usually consists of very busy people, it is likely that interviews of each company cannot be conducted in the same day.

4.5.1 Data collection at preliminary stage

An analysis on macro background of studied industry is important and essential for this research. At preliminary stage, the data are collected for two objectives. This is for the background analysis of industry context and to prepare a practical case pool, which both comes from secondary data. Industry analysis is conducted by using several secondary data sources including domestic and international business directories, commerce ministry, industry associations, and government departments. Having identified the importance of getting behind the merely observable or measurable to understand the forces within a real business situation, the research sought to understand and explain them by detailed investigation of firms within an industry context. The analysis of the Chinese petrochemical industry carried out in this study attempted to cover the totality of the relationships within that particular 'industrial system' (Easton, 1992; Mazet-Crespin, 1995). The spatial boundaries were defined by natural geographic boundaries
(Mazet-Crespin, 1995) --the interview firms are located within sub-region of the petrochemical industry. Having considered the general notion of context, the specific setting for this study is now described. Additional reports and statistics for background analysis are gained from Chinese Ministry of Commerce, provincial commerce ministry, international and local economic organizations (e.g. Hong Kong Trade Development Council) which released some information about foreign investment and industry reports. From the same data sources for primary research sampling, and deleting items with uncompleted information, 3283 FIPs in petrochemical industry are gathered for preliminary research.

4.5.2 Interview process

Particular endeavours were done to solve problems before and during interviews. In order to improve response rate and meet the demand of most interviewees, all interviewees and companies were guaranteed confidentiality, anonymity and non-attribution. In order to increase feasibility for comparative analysis and interview possibility, particular effort is made to obtain similar distribution of companies across different locations, country of origins and different ownership forms. After sending the first letters for the interview request to 140 firms, it took one month to receive only 9 firms who presented the willingness to take interview. In order to make the cases comparable across nationality, location and ownership type, 24 of the non-responding firms were contacts by phone and endeavour through personal relationships, 8 more companies agreed to participate in the interviews. The reluctance of firms to participate in the research was strongly detected by the researchers and is a common problem of research in Asian counties, especially in China.

A series of exploratory interviews were undertaken between 2007 and 2008 to gauge the extent to which the changes within the petrochemical industry would have an impact on the local relationships. The interview is started with interviewing one contacted manager who is usually one senior board member of each foreign subsidiary. They are a senior knowledgeable individual who are able to inform how he or she experiences and
manages relationships with their local key suppliers, buyers and collaborators and could provide the direction to the right person to interview if they cannot answer the detail about certain local relationship. In order to maximise understanding, the following stage in the interview is to employ the views of managers at different departments of each firm. These positions ranged from senior board members of firms to what one might term professional or managers in related department, such as including operation manager, manager director, purchasing manager, production manager, or marketing manager depending on the specific company. All of the informants will be personally participated in initial negotiations and for a venture or been involved in the venture's management in its early stages. The assessments of the subsidiaries' relationships with local firms were made with different managers in each subsidiary. All interviews were retrospective, possibly leading to reduced data quality due to memory loss; however, interviewees may have been more open and reflective than about current events, thus making this an important industrial network method (Easton, 1995). In this stage, senior board members were interviewed for the pilot interviews taking approximately twenty minutes.

Question techniques are important to increase the reliability of information and response rate. The interviews in this study are planned to use different types of questions (Gaskell, 2000). Levine (1980) discusses the techniques of designing questions in interviewing as appreciating the emotional states of informants, looking for clues, exploring suspicions, considering what language is used and with what level of accuracy, building rapport and methods of cross-examination. These approaches may be used during data gathering and analysis, but researchers need to know how to trust the results of these techniques. In this research, the questions in the interview guide (Appendix 1) were developed from the literature review and were designed to elicit descriptive data. Thus a semi-structured format was designed with open-ended questions and prompts and this was used in order to give structure so the interviewee felt comfortable; ensure that the interview was conducted systematically as far as possible; ensure that the research issues were at least touched on; in order that comparisons could be made (Easton et. al., 1993). The interview questions are of the open variety with probe questions also designed to further tease out open answers. The reliability of the interview topic guide was improved by
reformulating questions that caused misinterpretation in the early interviews to make them clearer to the interviewees in pilot study. Respondents were always asked to support their answers by specific examples. During the interviews, care was taken to guide the interviewees without bias so that they understood the questions and answered as freely as possible (Saunders et. al., 2003). Interviewees were asked to couch their responses as far as possible within the context of a critical incident or incidents (Chell, 1998; Flanagan, 1954) in order to maximize the richness of background conditions and overall context. The interviews questions about specific local relationship were very careful not to make the respondents select business relationships that are important for a specified reason, but for any reason as long as it are important to their business activities.

Interviews for each firm last for an average of one and half hour. Transcripts of the interviews were supplied to interviewees to ensure accuracy. Interviews were written recorded as most informants objected the use of tape-recorder. As the interviewees could be English-speaking or Chinese-speaking, the 17 in-depth interviews need to be conducted and transcribed by the researcher, together with many other informal, conversational-type interviews that are field-noted but not recorded and transcribed. Interviews were be transcribed and then collaboratively coded by the researcher if interviewee asked to.

In addition to interviews, approximately 20 pages of archival data were collected for each case, including the highlights of joint venture contracts, the foreign subsidiary and the parents' organizational charts, corporate brochures and annual reports, published case descriptions, newspapers and magazine reports about the projects, and planning and historical documentation supplied by the interviewees. Meanwhile, with multiple case designs and suggested comparisons, this information assist researcher to capture the foreign companies' strategies and activities and a rich holistic description could makes it possible to reveal the complex and changing nature of a business network. Data on inter-firm linkages are extremely hard to obtain in China. Government rarely collects or publishes the relevant information. Archival data regarding the companies' policies,
decision-making procedures, internal reports and external reviews are collected to build additional points of comparison.

4.5.3 Mail questionnaire results

Once familiarized with that situation of interviews, the authors designed a new set of questionnaires and sent them to the 302 active companies in August 2007 by fax or email. Because the questions in questionnaire involving various business activities, each questionnaire needs to be sent to a particular person of relative department in the company. This required knowing the name of the respondent before sending the questionnaire. Therefore the strategy chosen was to try and talk directly to the manager on the phone before the survey, not only to get to identify his/her name, but further to suggested they were going to receive a questionnaire. Each questionnaire was put in an envelope with printing address, prepaid return envelope, and an official letter issued by School of Management, University of surrey. Until February 2008, 180 firms were contacted, but only 15 questionnaires were returned. In regard to the experiences in interview administration, further endeavour is made to the companies that had not responded at the first round. It can be seen that following-up call in the second round is very helpful to increase response rate for questionnaire survey. These firms were approached via letter, with several follow-ups by mail, email and telephone. Then during the next ten months, more great effort had been conducted to reach more companies which result in 71 questionnaires received. 8 of them were discarded as the foreign share in these companies was less than 20%. Additional 28 firms said they would like to participate but their answers had been never received. In total, the responses rate is 21%.

4.6 Operationalization of Variables

After drawing out the propositions, one critical issue before testing network linkages in the framework is the operationalization of the variables. As mentioned before, the interview uses semi-structured questionnaires and allows interviewees flexibility to give information. Given the data obtained in interviews, questions in mail questionnaires use are provided with options to choose from. The process of categorising in case studies
could help define the dimensions of variables in survey. Table 4.1 summarize the operationalization of each indicator for structured questionnaire and coding of variables for statistical analysis. This research studies the linkages that underline particular activities with considering what kinds of actors are involved in the exchanges. The same measurement and coding designed for regress tool in the statistic analysis will be used for backward, forward and collaborative linkages so that it can capture the richness of the relationships involved.

4.6.1 Measurement of independent variables

Table 4.2 below lists the definitions and measurements of the five independent variables.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Definition of variables</th>
<th>Measurement and coding for regression tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country of Origin</td>
<td>Country of origin of the ultimate foreign parent firm</td>
<td>1=Japan, 2=Other Asian country/Region, 3=EU/US</td>
</tr>
<tr>
<td>Subsidiary age</td>
<td>Year of establishment with current foreign investor</td>
<td>Number of years since owned by the current parent MNE</td>
</tr>
<tr>
<td>Ownership mode</td>
<td>The equity share of MNE in the subsidiary</td>
<td>1=Joint venture/partially owned subsidiary, 0=Wholly owned subsidiary</td>
</tr>
<tr>
<td>Regional location</td>
<td>Location of subsidiary manufacturing factory</td>
<td>1=Yangtze River Delta, 2=Pearl River Delta, 3=Bohai Rim</td>
</tr>
<tr>
<td>Location-specific factors</td>
<td>Cost, infrastructure, local technological capability, industry cluster, FDI incentives, government assistance, compulsory regulations.</td>
<td>The perceived level of conditions in local networks, scaled from 1=very low to 5=very high</td>
</tr>
</tbody>
</table>

The information obtained in interviews and background analysis of the Chinese petrochemical industry help to create the dimensions of independent variables. To explore the different effect between partial and full-ownership of foreign affiliates on the local linkages, two measures of ownership mode are created: one for foreign firms with 100% foreign participation to their capital and one for the remaining foreign firms. Ownership mode or institutional arrangement of foreign subsidiary is assessed by the equity allocation. It is either a subsidiary established by an MNE or a formerly Chinese
firm acquired by a foreign MNE. However, acquisitions in the sample are too few to include as a separate category.

Regarding the characteristics of FDI inflow, the country of origin, or the nationality of the MNE could be broadly categorized into western European/U.S., Japan and non-Japanese Asian countries. It is considered that MNEs from specific regions share certain common in culture and competitive advantages although different countries are heterogeneous.

As discussed before, the locations of FDI projects differ by the business environment, including industry development, economic openness, favourable policy, nature resources and so on. In the case of China, distinct regions have been formed historically. This developed a regional classification of MNE activity in China, based on the degrees of economic liberalization and market economy permitted by the central government and the level of autonomy. Interviewees and respondents of the cases provide their perceptions of the regional location, in order to capture the possible effect of environment factors on local linkages decision. For quantitative analysis, based on data collection result, the locality of petrochemical projects could be classified into three regions. This classification distinguishes between inland and coastal regions, and among locations within the coastal regions that host the majority of China's FDI. Using this classification, it is interesting in studying how location related to FDI activities.

1. The metropolitan cities of Beijing, Tianjin, Hebei province, Shandong province and major cities of central provinces
2. Highly industrialized cities along Yangtze river Delta: Shanghai, major cities in Zhejiang and Jiangsu provinces
3. The south coastal localities, 5 SEZs (Shenzhen, Zhuhai, and Shantou in Guangdong Province; the entire island province of Hainan and Xiamen in Fujian province) created by the Chinese government, specifically for the purposes of attracting FDI
The variable for the firm's age is measured by the logarithm of the total number of full years between the firm's foundation and 2008. For the firms acquired by foreign MNE locally, the age will be the measure of time since the foreign investor owned the local entity, rather than the date since establishment. The size of the foreign affiliate is represented by the production capability classified by Chinese industry chamber as mentioned earlier in case sampling.

Respondents are asked to identify major location-specific factors of motivating foreign subsidiaries to networking with local firms. In questionnaire survey, respondents are asked to evaluate these factors of their firms' current location. These factors are expected to affect foreign firms' perceived cost and benefit to enhance local linkages and resource transfer. Borrowing the concept of FDI motives, these location factors can be sub-categorized according to the type of resource factors. Motive for investment included the resource-, market-, efficiency- and strategic asset-seeking motives used frequently in the literature (Dunning, 1993a). These motives could individually or collectively encourage foreign investors' entry into host location. They also help to gain a list of the catalysts for the regional difference that may influence on local linkages. Respondents will provide their scaled perceptions on these conditions in their local networks.

4.6.2 Operationalization of dependent variables

Based on the previous discussion, three variables are used to proxy both quantity and quality characteristics of MNE subsidiary's inter-firm linkages: strategic orientation, local collaboration intensity and degree of resource transfer. These variables rising from literature review are based on the multi-theoretical perspective that addresses the complexity of self-concept from both a multidimensional and a multi-theoretical approach. The main interest to examine inter-firm linkages bias toward 'local' scope in this research is that they are the direct mechanisms of MNE's impact in promoting the spillover to local firms. With different methods of measurement (Table 4.3), they can be applied to both the study of a dyadic relationship and the characteristic of overall linkages. As there are many different types of relationship which can connect up
networks, the variables are applied to each set of relationships (forward, backward and collaborative). Failure to distinguish different types of relationship can cause serious confusion in the analysis of networks.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Definition of variables</th>
<th>Measurement and coding for regression tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local orientation</td>
<td>Local orientation of sourcing: The share of input purchases from local Chinese firms relative to total input used</td>
<td>Percentage (0~100%)</td>
</tr>
<tr>
<td></td>
<td>Local orientation of sale: The share of sales to Chinese firms in China relative to total sales</td>
<td>Percentage (0~100%)</td>
</tr>
<tr>
<td>Intensity of local collaboration</td>
<td>Number of collaborative agreements with Chinese firms or organizations in China</td>
<td>1.None, 2. 1<del>2, 3. 3</del>4, 4.More than 4</td>
</tr>
<tr>
<td>Degree of resource transfer</td>
<td>The extent to which foreign subsidiary transfer knowledge/technology resources to local suppliers/customers/Collaborators in China:</td>
<td>1=None 2=some 3=substantial</td>
</tr>
</tbody>
</table>

The first variable is MNE subsidiary’s local orientation. It is used to measure the quantitative characteristic of overall level of foreign subsidiary’s sourcing and sale with host country firms. A comprehensive review of the methodology and measurement in local linkage studies was presented in Chapter Two. Among these methods, the first and most common way is applied in this research. Based on the same operation principle, this variable can be understood interchangeably as what have been used in previous studies such as linkage intensity, extent, strength or volume. Generally any manufacturing operation may consist of three components: input, process, and output, even these components are only a small part of a global operation of a MNE. To a large degree, these components reflect the basic elements of the value-chain model developed by Porter (1986). A foreign operation thus is set up to produce certain type of products, using the inputs sourcing from different locations and supplying to various locations. Consistent with and extending the earlier work by Kotabe and Omura (1989), the directional decision rule is applied to classify sourcing and sale activities on China-based—home-country based—other-countries based. In case study, both direction and magnitude of the value chain activities are employed as the decision rule to classify strategic orientation, which is thus calculated at each geographic level in the respective
totals. In the following mail survey, strategic orientation is simplified into a continuous measurement: local orientation of MNE subsidiary' value chain activities. Local orientation of sourcing is the percentages are based on the purchased value of input attributable to local Chinese suppliers. Local orientation of MNE subsidiary' sale with the local economy is equivalent to the proportion of sales with local buyers by financial value of Free on Board-based sales volumes. Hence, the extent of local sale also reflects the market-orientation as opposed to being exported to other markets of the subsidiary.

The intensity of local collaboration was in firstly recorded by the number of relationships formed with local partners for strategic/functional alliances or technology sharing and development in the three years prior to the survey. The more the connected relationships support cooperation in the relationship, the easier it is for the partners to coordinate their activities, increase the investment in the relationship, and thereby increase the joint productivity of the partner firms. Due to the highly non-normal nature of count data, and analysis of which aiming at the level rather than the existence of local collaboration, this variable was re-coded by ordinal measurement. To ensure that the re-coded order did not make a significant difference to the outcome of the estimation, two further versions of the dependent variable are constructed as follow:

1—None  2—1 collaboration  3—2–3 collaborations  4—4 collaborations  5—More than 5 collaborations;
1—None  2—1 collaboration  3—2 collaborations  4—3 collaborations  5—4 collaborations  6—more than 5 collaborations;

Another critical dimension, resource transfer referring to the types and quality of assistances and resources transferred to local network members suggests the quality of the local linkages. Interview questions related to technology transfer is drawn from the literature and interviews to investigate various content, means and recipients of resource transfer via each type of local relationship. There are three categories of transfer that are used in the statistical analysis stage: 'hardware' resource, knowledge resource and 'software' resource. This classification is derived from the results in section 5.1.2 of the
case study. In mail survey, the extent of local involvement in technology transfer is estimated by the empirical judgment provided by questionnaire respondents of the foreign firms. In order to adopt in regression method, the measurement of transfer degree is differentiated into three scales: no transfer, some transfer, and substantial transfer. This scale represents the 'overall' transfer in terms of each category of backward, forward and horizontal linkages.

4.7 Conclusion

This chapter draws on the decision of triangulation method throughout the research procedure. First, the multi-level research design described above allowed for the uncovering local networks in petrochemical industry which are resource dependent at multiple levels of analysis: country, industry, cross-firm, and firm level. Second, multiple methods of data collection and comparative research which involved in-depth case studies of 17 foreign petrochemical firms and statistical test with 63 firms' data. The interview will use semi-structured questionnaire with mostly open-ended questions to collect the unbiased information. Based on these data, statistical stages will be able to provide options in structured mail questionnaires. Operationalization of dependent and some independent variables in regression analysis will also be built up on interview results. The comparative case study of different foreign subsidiaries will be conducted integrating with cross location comparison will be conducted to allow for an analysis of external factors impacting local linkages. The in-depth case study was selected also in order to contribute to the understanding of firm's internal attributes impacting local linkages.
CHAPTER FIVE
ANALYSIS AND DISCUSSION

Following the method described in Chapter Four, a series of interviews and questionnaire survey were conducted so as to allow the research to obtain in-depth information about the specific characteristics of foreign-local IFLs in Chinese Petrochemical industry. The results presented give a wide diversity of uses of local relationships among the case companies, ranging from avoidance of relationships, rational and calculative use and recognition of being deeply socially embedded. In-depth description will complement the results of statistical analysis in order to provide evidence and insights to the final results. The end of this chapter will offer the wealth of discussion to the integrated results.

5.1 Preliminary Case Analyses

Analyses of the 17 interviewed cases concentrate on each specific relationship they created with the most important local firms. Results come from a careful analysis of foreign subsidiaries' comments on their local linkages within the framework devised in the previous chapter. A general description of each case is presented, the analysis of their local networks and relationships follows, before comparisons by postulated influential factors.

5.1.1 General description of the 17 interviewed cases

Table 5.1 below firstly displayed the descriptive information regarding to 17 companies' country of origin, ownership mode, regional location in China, motives for establishment, managerial localization of the company. As all interviewees and companies required guaranteed confidentiality, anonymity and non-attribution, in order to disguise their identities and represent them in the following analyses and discussion, they will be numbered from 1 to 17.
## Table 5.1 Summary of the 17 interviewed cases

<table>
<thead>
<tr>
<th>Case</th>
<th>CoO</th>
<th>Foreign share %</th>
<th>Location</th>
<th>Age</th>
<th>Motives for establishment</th>
<th>Managerial localization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Japan</td>
<td>100</td>
<td>Jiangsu</td>
<td>1999</td>
<td>Low cost, foreign company presence</td>
<td>Few management positions</td>
</tr>
<tr>
<td>2</td>
<td>Japan</td>
<td>100</td>
<td>Guangdong</td>
<td>2003</td>
<td>favourable policies, scale of foreign activities</td>
<td>Few management positions</td>
</tr>
<tr>
<td>3</td>
<td>US</td>
<td>100</td>
<td>Hebei</td>
<td>1998</td>
<td>Acquisitioned factory's condition, Low cost, market</td>
<td>General Manager, most management positions</td>
</tr>
<tr>
<td>4</td>
<td>Singapore</td>
<td>100</td>
<td>Hebei</td>
<td>2004</td>
<td>Low cost, local market</td>
<td>some management excl. production</td>
</tr>
<tr>
<td>5</td>
<td>Germany</td>
<td>50</td>
<td>Guangdong</td>
<td>1996</td>
<td>Low cost, Partner's capacity and technologies, local infrastructure</td>
<td>Vice-Chairman &amp; General Manager. Most management positions</td>
</tr>
<tr>
<td>6</td>
<td>Germany</td>
<td>60</td>
<td>Jilin</td>
<td>1994</td>
<td>economies of scale of network partner, local market</td>
<td>Chairman &amp; Vice-General Manager, many management excl. R&amp;D</td>
</tr>
<tr>
<td>7</td>
<td>U.S.</td>
<td>100</td>
<td>Jiangsu</td>
<td>1998</td>
<td>Low cost, market, Industry cluster, technology alliance, credit incentive</td>
<td>Some management positions excl. R&amp;D department, HR</td>
</tr>
<tr>
<td>8</td>
<td>Japan</td>
<td>80</td>
<td>Shanghai</td>
<td>2002</td>
<td>Low cost, market resource of JV partner, foreign firm presence</td>
<td>Vice-General Manager, some management excl.Techn&amp;production</td>
</tr>
<tr>
<td>9</td>
<td>Korea</td>
<td>80</td>
<td>Tianjin</td>
<td>2001</td>
<td>Low cost, local market Culture proximity</td>
<td>Vice-Chairman &amp; Vice-General Manager, some management excl.Techn&amp;production</td>
</tr>
<tr>
<td>10</td>
<td>U.S.</td>
<td>50</td>
<td>Jiangsu</td>
<td>2001</td>
<td>Policy incentive, quality supply, cost, research intensity</td>
<td>Vice Chairman &amp; General Manager, most management positions</td>
</tr>
<tr>
<td>11</td>
<td>Taiwan</td>
<td>100</td>
<td>Shanghai</td>
<td>1999</td>
<td>Low cost, tax incentive, Resources, following customers</td>
<td>Some management positions excl.Techn&amp;production</td>
</tr>
<tr>
<td>12</td>
<td>Germany</td>
<td>100</td>
<td>Guangdong</td>
<td>1990</td>
<td>Favourable policy, Low cost</td>
<td>Some management positions excl. R&amp;D, production, HR</td>
</tr>
<tr>
<td>13</td>
<td>Japan</td>
<td>50</td>
<td>Tianjin</td>
<td>1993</td>
<td>Low cost, quality of supply, market size, tax incentive</td>
<td>Vice General Manager, some management excl.Techn&amp;production</td>
</tr>
<tr>
<td>14</td>
<td>U.S.</td>
<td>51</td>
<td>Hebei</td>
<td>1998</td>
<td>Partner’s economies of scale, quality, Local market</td>
<td>Chairman &amp; General Manager, most management positions</td>
</tr>
<tr>
<td>15</td>
<td>Taiwan</td>
<td>60</td>
<td>Jiangsu</td>
<td>1999</td>
<td>Incentive policy, Partner’s production capability, local market</td>
<td>Some management excl.Techn&amp;production</td>
</tr>
<tr>
<td>16</td>
<td>Taiwan</td>
<td>100</td>
<td>Guangdong</td>
<td>2002</td>
<td>Follow customers, favourable policies, cost saving</td>
<td>Some management positions excl.Techn&amp;production</td>
</tr>
<tr>
<td>17</td>
<td>Japan</td>
<td>100</td>
<td>Tianjin</td>
<td>2001</td>
<td>Low cost, concentration of 'compatriot', financial incentives</td>
<td>Few management positions</td>
</tr>
</tbody>
</table>

As explained in chapter four, the sample method endeavours to ensure that companies would be comparable in terms of selected control variables: they are all subsidiaries of multinational groups located in China; all the firms are Medium-scale firms according to their annual output; the main products of these firms are categorized into Organic...
chemicals or Synthetic chemicals; their upstream input is from basic petrochemical suppliers, and downstream customers include manufacture of synthetic fibre, rubber, plastic.; their employee number ranges from 38 to 50 which reflect the same level of labour-intensive and technology intensive of production.

The sample counts 7 Western (EU and U.S.) subsidiaries, 5 Japanese subsidiaries and 5 non-Japan Asian subsidiaries. Regarding to the type of ownership, there briefly three structures were observed in these cases: foreign wholly owned subsidiaries (9 cases); foreign majority ownership (5 cases) at 51%, 60% or 80%; even ownership between local and foreign partners (3 cases). With respect to their location in China, 7 cases in Bohai Rim (B) (including Hebei, Jilin, and Tianjin); 4 cases located in Guangdong province, Pearl River Delta (P); the rest 6 cases concentrate in Yangtze River Delta (Y) (including Shanghai and Jiangsu).

Although these companies are comparable, any two comparative companies are unlikely to be exactly the same on all aspects, for example, differences exist in the length of time spent in China, organization structure and the environmental conditions in specific city are unavoidable.

Firstly, the age of these companies in China varies widely, from 1987 to 2004. None of these cases established in the period from 1979 to 1989. Because of lack experience at the early stage of open-door policy to foreign direct investment, there are few companies in the population invested in this period. 7 companies were established after 1999. #8 was a Chinese-owned enterprise started from 1996, but foreign firm acquired majority share of the company in 2002. Other nine cases are all Greenfield firms established before 1999 by foreign MNEs.

According to these interviews, there is a general pattern in the relationship between the ownership mode and the allocation of key management positions in foreign subsidiaries. This situation is well illustrated in the case sample. Since the ownership of most cases is dominated by the foreign MNE, local control of all management is not common.
However, joint ventures with minority local ownership (that is, those below 50% local ownership) do not necessarily restrain managerial localization. For instance, of the five such joint ventures, two have locally nominated chairmen and vice-general managers. The Chinese side often held both the positions of board chairman and general manager (or managing director) when it controlled over 70% of the shares. It might hold one of the two positions when its shares fell to 50%–70%. If majority shareholding belonged to the foreign investor, the local side could hold the positions of the vice-chairmen and vice-general manager instead. Moreover, some companies show higher localization of personnel than others do. The data provided in #1 provided the percentage of local managerial employee in various functional departments against the total employee number is planning and survey 48.2%, personnel 45.8%, finance 33.2%, 52.5% of sales, purchasing 25.3%, 10.2% research and development. Comparatively, #13’s proportion of local employee in top and middle management positions is prominently higher in various departments: 63.3% procurement, personnel 68.6%, Finance 66.7%, Planning survey 57.1%, 86% sales, manufacturing 58.6%, 47.3% research and development. #3, #7 and #14 also indicated that locally nominated persons account for 50% to 60% of the whole managerial structure of the company.

Each respondent is asked to identify multiple motives to operate at current location in China. The index of motives in each category (resource, market, efficiency and strategic assets) is composed by the difference ‘resources’ seeking. The result implies that the most frequently cited motivation is the low cost/price. 15 foreign firms stated that the most important benefit they want to gain from local networks is the low price supplies. The second major motivating factor identified by 12 companies is the market size or potential. 11 companies emphasised the FDI incentives implemented by Chinese government. Then industry agglomeration and support are concerned by 5 companies. 5 JVs are fostered by local partner’s capability. Four cases #1, #2, #8 and #17 consider the importance of foreign firm concentration that enhances their confidence to invest. 3 companies’ answers shed light on the access to local research and expertise resources. #11 and #16 reported that proximity to customers is the most important factor for initial entry to China, but lower price is equally important to subsequent development in local
relationships. #8 specifically indicates that geographic and culture proximity to their home region is an important factor in local relationship formation. These motives are found to be various by nationality meanwhile. Strategic resources, such as industry cluster and technology are more frequently mentioned by Western cases, which are differed from other firms that are mostly based on cost-advantage seeking in local relationships in order to optimise their intangible assets and advantages. A feature of the local operations of Japanese cases is a dichotomy between the main motives related to cost and quality of supplies. One group of Japanese cases are often a vehicle to take advantage of the comparative advantages in these regions in terms of manufacturing costs, whereas another group of cases is primarily established to improve access to adequate and quality input. Motives related to strategic resource such as intensity of technology and local expertise in local suppliers are only cited by cases in Shanghai and Jiangsu of Yangtze Delta.

Equity-based relationships between MNE subsidiary and local partner are particular important to joint venture cases. The respondents were asked to reflect upon the main advantages for engaging in joint ventures. Based on responses from 8 joint venture cases, it appears that joint ventures are apparently critical in influencing other non-equity relationships in joint venture cases, since the foreign investors or partners have brought diverse interests and resources to the joint ventures and these have affected the development of the JV and its local network systems. Almost all joint ventures report advantages of cultural proximity in order to reduce risks. Local partners are also considered as intermediate contact to local government and industry. 7 out of 8 joint ventures cited advantages of reducing operation uncertainty in China due to insurance of low price and adequate supplies. 5 cases reported local partners provide access to distribution and new client resources to their joint ventures. Most of foreign investors establish the JV with a SOE or province-owned enterprises (POE) for three reasons. First, in many industries a partnership with a local SOE is required to obtain governmental approval and a business license. However, the number of industries where local equity stakes are mandatory is declining; and most export-oriented businesses can operate without local partners. Second, local SOEs may control resources that would be
essential for the operation of the business, and which can only be accessed through a JV. Third, a JV may be voluntary in the sense that both full and shared ownership are feasible but the contributions of a local partner are expected to outweigh its costs.

In order to analyze the cases against the research issues and enable comparison, the selected companies are grouped into comparative pairs by three control variables—regional location, ownership mode and country of origin, as displayed in Table 5.2 below.

Table 5.2 Comparative groups in the 17 interview cases

<table>
<thead>
<tr>
<th>Compare by Locations</th>
<th>JV EU/US</th>
<th>WOS EU/US</th>
<th>WOS Japan</th>
<th>JV Japan</th>
<th>WOS Other</th>
<th>JV Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bohai Rim (B)</td>
<td>6,14</td>
<td>3</td>
<td>17</td>
<td>13</td>
<td>4,11</td>
<td>9</td>
</tr>
<tr>
<td>Yangtze Delta (Y)</td>
<td>10</td>
<td>7</td>
<td>1</td>
<td>8</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Pearl River (P)</td>
<td>5</td>
<td>12</td>
<td>2</td>
<td>16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compare by Ownership mode</th>
<th>B EU/US</th>
<th>Y EU/US</th>
<th>P EU/US</th>
<th>B Japan</th>
<th>Y Japan</th>
<th>B Other</th>
<th>Y Other</th>
<th>P Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wholly owned Subsidiaries (WOS)</td>
<td>3</td>
<td>7</td>
<td>12</td>
<td>17</td>
<td>1</td>
<td>4,11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joint ventures (JV)</td>
<td>6,14</td>
<td>5</td>
<td>10</td>
<td>13</td>
<td>8</td>
<td>9</td>
<td>15</td>
<td>16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>EU/US</td>
<td>3</td>
<td>6,14</td>
<td>7</td>
<td>5</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Japanese</td>
<td>17</td>
<td>13</td>
<td>1</td>
<td>8</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Other Asian</td>
<td>4,11</td>
<td>9</td>
<td>15</td>
<td>16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.1.2 Sourcing and sale activities of the 17 cases

The supply chain system including both sourcing and sale activities exhibits a vertical relationship between foreign and local firms. Although the genesis of each case has been unique, an integrative approach to analyze the sourcing and sale activities can develop an aggregated picture of these firms' strategic orientation. It is able to further illustrate the attributes of specific relationships with the major local suppliers and customers in China. The key points obtained in interviews are interpreted and summarized in tables, which provide a detailed and rich picture of individual case's approaches to the use of local relationships in strategy. Additional information (Appendix 2) introduced the history and relevant strategies of the interviewed cases.

Classification of the strategic orientation

The majority of the 17 cases produces and/or distributes products and/or services beyond the Chinese border. Yet, very few of them have the ability to operate products and services around the world and there is no balanced geographical dispersion of input and output achieved in most cases. The results suggest that the 17 petrochemical enterprises display considerable variety of local orientation. The integrative approach to the sample results in five types of geographic configuration of foreign subsidiaries' sourcing and sale (Table 5.3).

The classification aims to analyze MNE subsidiaries’ sourcing and sale orientation toward the 'triad'—home market, host market (China) and other overseas markets, which suggest the level of their local orientation (toward host market). The principle behind this classification is to group observations so that the within-group similarity is maximised and the between-group similarity is minimised. Strategic orientation of sourcing (or sale) is calculated by percentage of the purchased (sale) value in each of the 'triad'. The upper threshold of 50% is chosen as it is assumed that a region representing more than 50% of total sales will systematically both shape and constrain most important decisions and actions taken by the MNE (e.g. Crone, 2002; Williams, 2005; Yamawaki, 2004). It also implies a concentration of the MNE's subsidiaries in that region. The lower threshold of 25% is chosen because it assumes that having home and
other overseas markets, each representing at least one fourth of a case’s sales and procurement, reflects impressive equal level between local and non-local dimension.

Table 5.3 17 cases’ strategic orientation of input (sourcing) and output (sale)

<table>
<thead>
<tr>
<th>Orientation toward input market</th>
<th>Predominately home market</th>
<th>Predominately host market (China)</th>
<th>Globally dispersed in various markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predominately home market</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Predominately host market (China)</td>
<td>S1 (8, 9, 11)</td>
<td>S3 (3, 4, 6, 13, 14, 15, 17)</td>
<td>None</td>
</tr>
<tr>
<td>Predominately host market</td>
<td>S2 (2, 16)</td>
<td>S4 (5, 7, 10)</td>
<td>S5 (1, 12)</td>
</tr>
<tr>
<td>Host ≥ 50%</td>
<td>Home-sourcing &amp; Local market access</td>
<td>Local sourcing &amp; Global market access</td>
<td>Global-oriented subsidiary</td>
</tr>
<tr>
<td>Rest of world (ROW) ≥ 50%; Or 25% ≤ Home/Host/ROW ≤ 50%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: 1. ‘Or’ represents another situation; 2. S1~S5 represent 5 types of strategic orientation; 3. The numbers in brackets represent 17 interviewed cases.

The first and second type of strategic orientation in China could be described as a group of home-oriented sourcing with and local market access (S1) or global market access (S2). Five companies (#2, #8, #9, #11 and #16) belong to the two categories reported over half of input is dependent on internal sourcing or other suppliers in home country. In S1, finished products are marketed dominantly in China. In S2, #2 has no significant domination of sale in any of the three regions—China, home country and other overseas markets, while the other case #16 has 53% of its sale in Asian-pacific markets. These cases seem to be the mostly internalized subsidiary of MNE which aim to take advantage of low manufacturing costs, to control of production quality and to protect proprietary assets. Although it appears that these two types of foreign firms require a local presence in China, they are expected to engage in minimal linkage activities with local firms and consequently may have the least potential for knowledge transfer and spillovers, or the spillovers to domestic firms might be limited to the affiliates’ presence in the Chinese market as competitors.
Local embedded subsidiary (S3) is distinguished by having the highest score on local vertical linkages intensity indicating the most substantial purchase and sale in China. For the seven firms in this group, China is the base of input sourcing for local production and they intend to supply the local market. According to the mean value, over 66% of these cases’ input is sourced from local Chinese firms. However, it is noteworthy that #15 and #17 have critical procurement with foreign-owned firms in China. Especially #17 is strongly integrated into global division and coordination networks of the MNE. Looking at the trade structure of #17, China is the most important single source of supplies (60% of total purchase). However, purchase from the foreign-owned firms amount to, the highest share of supplies (40% of total purchase).

S4 represents the strategy ‘standing locally and going out to the world’. Three companies displaying this type of strategic orientation score over 50% on upstream buying activities in China and indicate high level of export. Their average local sourcing weights 62% of total input. Nevertheless, #7 indicated important linkage with a US company located in China. In addition to serve local market, they have strong capability to support a few overseas markets. Strategic orientation of this group suggests that these subsidiaries are positioned to integrate into both global networks and local economy defined by corporate global strategy. Especially #10 indicated that the products had been mostly exporting to Asian and U.S. markets during the first years. Firms forming this type of linkage pattern aim to use subsidiaries in China as a regional or global base for manufacturing products meeting export standard for international markets, and meanwhile becoming adapted to the local market demand.

On average, the fifth type (S5) of strategic orientation scores slightly higher on local sourcing than the first two groups though are still below 50%. It is more globally-oriented toward both input and output, which means no single source absolutely dominates the supply. Home country and China is equally important for #1’s input, while in #12 local input is slightly lower than import from Japan and Singapore. Both of these companies have sales dispersed in global markets. These foreign subsidiaries have complex activities on importing, exporting and distribution of their products in the
context of China. These foreign subsidiaries served as units of global coordination and constitute a part of international value chain of MNEs. The raw material is predominately sourcing from the MNE’s regional supply centre in Asian countries at competitive prices. Equipment, machineries and specialized ancillary material are purchased from U.S. and European markets. Internal linkages between subsidiaries dispersed worldwide are also important implementations of strategic decision in internationalization activities of the MNEs.

**Major supplier relationships in China**

Table 5.4 below summarizes local backward relationships covering five aspects of characteristics (national origin of linkage partners, number of local or foreign partners, types of purchase from local suppliers, selection criteria, and purchase strategy).

### Table 5.4 Major supplier relationships within China

<table>
<thead>
<tr>
<th>Cases</th>
<th>Ownership of supplier</th>
<th>Function of relationships</th>
<th>Nature of relationships</th>
<th>Alternatives firms</th>
<th>Selection criteria on suppliers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 Chinese</td>
<td>Ancillary material</td>
<td>Medium to short contract</td>
<td>Multiple sources of at least one product</td>
<td>Quality, price, experience, parent firm’s buying</td>
</tr>
<tr>
<td>2</td>
<td>2 keiretsu</td>
<td>Critical and Ancillary material</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>3</td>
<td>3 Chinese</td>
<td>Critical, ancillary material</td>
<td>Short term contract</td>
<td>Multiple sources of some products</td>
<td>Quality, price, co-decide with parent firm</td>
</tr>
<tr>
<td>4</td>
<td>4 Chinese suppliers</td>
<td>Critical material, certain specialization</td>
<td>Long-term contract</td>
<td>Single source of each input product</td>
<td>Price, quality, delivery</td>
</tr>
<tr>
<td>5</td>
<td>1 American</td>
<td>Equipment</td>
<td>Medium to short contract</td>
<td>Single source of most input products</td>
<td>Price, delivery, quality</td>
</tr>
<tr>
<td>6</td>
<td>5 Chinese</td>
<td>Critical material from JV partner; ancillary material</td>
<td>Long term to medium-term contract</td>
<td>Exclusive critical material from equity-based supplier, Single source of other inputs</td>
<td>Quality, delivery time, technology</td>
</tr>
</tbody>
</table>

161
<table>
<thead>
<tr>
<th></th>
<th>1 Foreign-owned</th>
<th>2 Chinese suppliers</th>
<th>1 keiretsu</th>
<th>4 Chinese suppliers</th>
<th>5 Chinese suppliers</th>
<th>3 Chinese suppliers</th>
<th>1 Taiwanese supplier</th>
<th>5 Chinese suppliers</th>
<th>4 Chinese suppliers</th>
<th>1 Intra-MNE supplier</th>
<th>5 Chinese suppliers</th>
<th>All Chinese suppliers</th>
<th>3 Chinese suppliers</th>
<th>1 Taiwanese supplier</th>
<th>1 Chinese suppliers</th>
<th>3 Japanese suppliers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Equipment, technology service</td>
<td>Critical material</td>
<td>Specialized auxiliaries</td>
<td>Small amount of critical material, Ancillary material</td>
<td>Critical material with certain specialization; ancillary</td>
<td>Ancillary material</td>
<td>Critical material</td>
<td>Critical, ancillary material, few equipment components, specialized auxiliaries</td>
<td>Critical material from JV partner, ancillary from others</td>
<td>Specialized auxiliaries</td>
<td>Critical and specialized auxiliaries from JV partner, ancillary material, equipment components</td>
<td>Ancillary material</td>
<td>Critical, ancillary material</td>
<td>Critical, equipment</td>
<td>Ancillary material</td>
<td>Critical material</td>
</tr>
<tr>
<td>7</td>
<td>Long to Medium term contract</td>
<td>Single source of each input product</td>
<td>Quality, cost, service, jointly selection with key customers</td>
<td>Long-term</td>
<td>Single source of each input product</td>
<td>Quality, stable supply, price, reliable delivery, decided by assessment team in HQ</td>
<td>Long-term</td>
<td>N/A</td>
<td>N/A</td>
<td>Long-term</td>
<td>Single source of each input product</td>
<td>Trust, technology cooperation, growth potential</td>
<td>Long-term</td>
<td>Single source of each input product</td>
<td>Quality, delivery, price, service, evaluation by other firms</td>
<td>Medium-term</td>
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<tr>
<td>8</td>
<td>N/A</td>
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Note: N/A—data is not available  
Source: 17 company interviews
Another notable characteristic in these cases is the tendency for the critical suppliers, both in developed and less developed regions, to be located at a short geographical distance from each other in order to more efficiently organize deliveries of chemical materials and communications. Of all 76 suppliers in China identified in the 17 cases, 12 suppliers are located inside the region with the focal foreign buyers; 14 suppliers in China were distributed beyond the region, at national level; the rest 48 suppliers were located in the same city and industry park. This indicates that a proportionally larger number than could be expected is located close to the supply plants in China.

17 Cases’ relationships with local suppliers varied from indirect contact through intermediates, formal ones based on contracts, through short-term formality to long-term interdependence relationships. Relationships with the most important suppliers are all direct without any intermediates. Comparing the relationships with ancillary input suppliers, foreign subsidiaries are more likely to establish long-term linkages with critical input suppliers. Several interviewees describe these direct relationships as long-term supply relationships with incremental changes along the history. Long-term contracts are used to secure stable and quality supplies which could be regarded by local suppliers. In terms of suppliers of secondary equipment and other ancillary material, foreign firms managed them tightly with short renewable supply contracts, usually one to three-year length. Some interviewees however, see these relationships with ancillary resources suppliers as area of long-term relationships that can be fostered, or as short-term transactions or contracts to be reviewed and amended as necessary. Foreign firms’ uses of short-term relationships point out reflect their distrust on local firms and their flexibility appeal in uncertain legal environment.

Strategic orientation of foreign firms analyzed in last section has suggested that foreign firms in China not only form relationships with Chinese firms, but very prominently rely on the import from overseas firms, or supplies from foreign-owned firms operating in China. For example, #9 and #16 maintain close relationships with suppliers in home country. In the conceptual discussion of local linkages, host country may benefit directly from transfer of technology and skills only if the local firms are national firms, because
it supposed that the host country is interested by the technological upgrading of its own firms. Therefore, nationality ownership of foreign firms' network partners in China needs to be considered in order to distinguish the foreign-foreign linkages from foreign-local linkages, as well as to indicate how much direct inputs are actually purchased from Chinese-owned suppliers. Foreign affiliates (e.g. #3, #8, #11, #16 and #17) reported foreign-owned suppliers among the most important ones in China. In #17, for instance although its local orientation of sourcing accounts more than 50%, purchase from other Japanese firms actually dominate in this proportion. Many of these cases' foreign-owned suppliers are the parent companies' home country suppliers that followed to continue supplying in China. In addition, strong intra-MNE relationships with sister subsidiary are found in such as #1, #8 and #13.

Companies have different strategies in supplier selection process. Some firms (e.g. #3, #4, #5, #6, #7, #12 and #14) choose a single supplier for each type of input. Foreign firms choose this strategy mostly because the good performance of their local suppliers where the trust generated between each other. These single suppliers also have own technological capabilities and long history of supplying on international market. Those firms (e.g. #1, #2, #11 and #17) that purchase one product from two or more local firms are wholly owned subsidiaries and have relatively shorter history in China. Therefore, dispersed supply networks to some extent can offer less risk and more secure on input supply. Chemical companies in this research present a philosophy of centralization, monitoring, control and quality orientation in management and production. Quality-oriented practice is likely to be transferred from MNE to the external links of the subsidiaries, which means foreign firms will extend their standards as well as monitoring and control practices to local suppliers. #1 and #8 particularly emphasized the strict examination on current production capability of potential suppliers. They commented that quality problems of local supplies are still the impediment for raising local sourcing and supplier relationships in China. Due to high operational risks, these subsidiaries have little or no tolerance for compromises on safety and quality of inputs. When selecting local suppliers in China, most foreign firms prefer to consider Chinese firms that have prior work experiences with foreign firms.
Interviews reveal the general process in selecting local network partners, particularly suppliers and collaborators. Analysis of the process brought about the selection criteria and the role of subsidiary, parent firm and government in the linkage formation. Wholly owned subsidiaries (e.g. #1, #2, and #11) require the highest degree of control in order to implement the sourcing strategies of the MNE. They tend to rely heavily on the parent firm for supplier selection, output sales, personnel, and technical factors. Meanwhile they aim at control of and securing stable inputs and timely delivery of material and additives are critical to the success of production. By contrast, other foreign subsidiaries mostly joint ventures tended to independently choose local suppliers and collaborators. Local government is involved in foreign firms' supplier selection, for example, #6 chose one supplier from local potential vendors recommend by Chinese partner and local authorities. Interviewees provided their understanding that due to the fact that these subsidiaries intended to engage partnership with Chinese firms in overcoming the deficiencies in market knowledge and information that are essential to carrying out local sourcing. Existence of local partner is an incentive to increase and develop foreign subsidiaries’ business in China.

Interviewees of these foreign company cases normally talk about both foreign-owned and local-owned suppliers, which enable a comparison between the two types of relationships. The local purchase always contains different level of technology. Foreign subsidiaries are more likely to purchase high-technology equipments or specialized additives from overseas or foreign-owned firms in China. Case #4 and #12 for example identify the equipment suppliers in home and overseas markets. Purchases of specialized products from overseas suppliers mainly because Chinese suppliers are only able to supply specialized products to a minor extent or not at all which signal supply difficulties in China. Supplies from locally-owned firms are mostly bulk of standard material input and small amount of hardware pieces. These products are characterized by comparatively standardized and well-established technology. In #13, for instance, its local equity-based supplier produces ‘generic’ intermediate outputs which are ‘not strategically related to the production process of the foreign company’. For example,
foreign firms (e.g. #5, #6, #7, #10, and #12) present certain committed relationships and purchase specialized or customized rather than standardized organic chemicals from Chinese firms.

**Major customer relationships in China**

Comparing with supplier linkages, there is less variety in MNE subsidiaries’ inter-firm relationships with local customers. Table 5.5 below summarizes three features.

**Table 5.5 Major customer relationships within China**

<table>
<thead>
<tr>
<th>Cases</th>
<th>Location of local customers</th>
<th>Nature of relationships</th>
<th>Distributors/agents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Shanghai and Nanjing</td>
<td>Medium term contracts</td>
<td>Sister distributor subsidiary</td>
</tr>
<tr>
<td>2</td>
<td>Large cities in the province</td>
<td>Medium term contracts</td>
<td>Own sale force</td>
</tr>
<tr>
<td>3</td>
<td>Within the same province</td>
<td>Long-term contracts</td>
<td>5 Chinese agents</td>
</tr>
<tr>
<td>4</td>
<td>Within same province of the case</td>
<td>Medium to short term contract, a few spot buyers</td>
<td>A few short term agents</td>
</tr>
<tr>
<td>5</td>
<td>Across regions</td>
<td>Long-term to medium-term contract</td>
<td>1 Chinese distributor</td>
</tr>
<tr>
<td>6</td>
<td>Across regions</td>
<td>Long to medium-term contracts</td>
<td>1 distribution subsidiary of JV partner</td>
</tr>
<tr>
<td>7</td>
<td>Two large cities in the region</td>
<td>Long to Medium term contracts</td>
<td>2 foreign owned and 8 Chinese agents</td>
</tr>
<tr>
<td>8</td>
<td>Within same province of the case</td>
<td>Long to medium term contracts</td>
<td>1 Chinese and dispersed small agents nationwide</td>
</tr>
<tr>
<td>9</td>
<td>Within the same province</td>
<td>Short term, a few spot buyers</td>
<td>1 Chinese distributor</td>
</tr>
<tr>
<td>10</td>
<td>Large cities within the province</td>
<td>Long-term formal contracts</td>
<td>1 Chinese distributor</td>
</tr>
<tr>
<td>11</td>
<td>Within same province of the case</td>
<td>Long-term contracts</td>
<td>1 Chinese 3 Taiwanese agents</td>
</tr>
<tr>
<td>12</td>
<td>Metropolitan cities within the region</td>
<td>Long to Medium-term contracts</td>
<td>8 distributors of foreign and Chinese agents</td>
</tr>
<tr>
<td>13</td>
<td>Within the same region of the case</td>
<td>Long term contracts</td>
<td>1 distribution subsidiary of JV partner</td>
</tr>
<tr>
<td>14</td>
<td>Within same province of the case</td>
<td>Long to medium-term contracts</td>
<td>1 distribution subsidiary of JV partner</td>
</tr>
<tr>
<td>15</td>
<td>Across regions</td>
<td>Medium to short term contracts</td>
<td>1 Chinese distributor</td>
</tr>
<tr>
<td>16</td>
<td>Within same province</td>
<td>Medium term contracts</td>
<td>1 Taiwanese distributor</td>
</tr>
<tr>
<td>17</td>
<td>Within same province</td>
<td>Medium term contracts</td>
<td>Internalized distribution centre</td>
</tr>
</tbody>
</table>

*Source: 17 company interviews*
Foreign firms' relationships with the major local customers usually fulfilled direct activity functions and are closely and tightly-managed with many on medium and long-term performance-based contracts. Local clients of the cases consist of both foreign-owned and Chinese firms, but all the largest customers are reported as Chinese-owned. Ability of producing specialized and customized products in local market was claimed in five cases: #5, #7, #10, #12 and #14. This characteristic will be further analyzed with forward resource transfer in the following part.

The geographic distribution of customers expands from local to national range which does not show large disparity among the cases. However, some cases i.e. #5, #6 and #15 draw their revenue from serving fragmented markets all over China including small cities and towns, because 'the JV partner have broad distribution channel in China, and long distanced regions'. These cases have established a number of direct customer relationships over a large area. In comparison, some cases e.g. #1, #2, and #7 concentrate marketing in metropolitan cities and integrated markets within the regional market in order to reduce the cost of complex distribution and transport, or they chose to rely on local agents to increase market coverage. National arena is important from the point view of technological development. Almost two out of three firms claim that there is at least one important customer is located outside the regional market.

The interview results suggest that the most diversity in forward linkages is the strategy of using intermediates. It can be seen from the above table 5.5 that intermediate firms are more usually used in forward linkages than backward linkages. There are five types of distribution strategies are identified. The mostly used strategy is to cooperate with local Chinese distributors who controlled most channel resources and have government support. Nine cases (3, 5, 6, 8, 13, 14, 10 and 15) have long-term relationships with local distributors, due to domination of Chinese enterprises in petrochemical distribution and the professional chemical distribution is still an infant industry in China. Four companies (#1, #2, #4 and #17) choose to internalize distribution by using own sale force or sister-subsidiary of the MNE. These cases appear to be significantly more distribution intensive than others, which would consequently end up with higher physical
distribution costs. Multiple distributors of both foreign and Chinese nationality are employed by three cases (¹11, ⁷ and ¹2) that have respective roles in exporting and local sale. ¹6 has a sole international distributor for warehousing and logistics management.

5.1.3 Local collaborations and resource transfer of the 17 cases

This section aims to analyze the quality linkages in terms of MNE subsidiaries' local collaboration activities and resource transfer to local firms.

The types and number of local collaborations

To facilitate comparison, foreign subsidiaries are asked to comment all collaborative agreements during the recent three years of operation. With respect to the geographic scope of collaborative relationships, two cases ¹5 and ¹0 reported having collaboration agreements with overseas marketing agents. Regarding to R&D collaboration, ¹2 had a partnership project with a chemical research firm located in Hong Kong, and ¹ had one product development project conducting with an U.S. company.

Table 5.6 assembles the local collaborators identified in these cases into three major categories, and there are various types of content in each category. The number of local collaborations of the 17 cases range from zero to three. Over half of the interviewed companies (10 out of 17) formed at least one collaborative agreement with a Chinese firm or organization on average. Among them, case 5 indicated three collaborations with local firms or organizations. Local collaborations broadly range across different forms, including informal co-operation, friendly help and assistance, socially-based collaborations, sharing of technical and market information and R&D funding projects at local institutions. Therefore, these collaborative relationships could be committed or just connected. Interviewees' attitude toward cooperative relationships with local petrochemical companies rang from none at all (there being no reason to talk, according to the interviewee at ²) through avoidance (¹, concerns about conflict of interest), to
close social and technology sharing interactions (#6, #10 and #15), to formal cooperation with an equity linkage (#7). In term of identity of these cases’ collaboration, more types of cooperation are found with local institutions rather than business actors, based on varying motivations. These cooperative linkages fulfil four main functions in aspect of marketing, product development, human resource and social linkages.

**Table 5.6  Local collaborative relationships (in recent three years)**

<table>
<thead>
<tr>
<th>Local Collaborators</th>
<th>Content of collaboration</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local research institutions</td>
<td>Collaborative R&amp;D project with local institution</td>
<td>5, 6, 10, 15</td>
</tr>
<tr>
<td></td>
<td>Graduates placement and training collaboration with local university</td>
<td>4</td>
</tr>
<tr>
<td>Local enterprises</td>
<td>Technical collaboration with local enterprise on product development</td>
<td>12, 13</td>
</tr>
<tr>
<td></td>
<td>Collaboration with local distributors on delivery or logistic management</td>
<td>5, 8</td>
</tr>
<tr>
<td></td>
<td>Cooperation agreement under frame agreement on a B2B online platform</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Established JV with another local small chemical enterprise</td>
<td>7</td>
</tr>
<tr>
<td>Local authorities and</td>
<td>Informal or social-based collaborations with industry governance, membership of the industry body, the Chinese Petrochemical Association</td>
<td>6, 7, 14</td>
</tr>
<tr>
<td>government</td>
<td>Strategic development program of government; cooperation scheme with the local government</td>
<td>4, 5, 10, 15</td>
</tr>
</tbody>
</table>

*Source: 17 company interviews*

The first type is collaborative linkages with local universities or research institutions: #5, #10 and #15 undertake R&D projects with local institutions; #4 arrange placement and training programme for local university graduates; #6 started strategic alliances with a local university, with the support of foreign company’s strong technical stock and local intelligence to cooperatively develop quality product: ‘*This (cooperative projects with local university) helps us to meet the strict quality requirement and meanwhile eliminate causes underlying to previous logistic strategy*.’ Aligning with localization strategy, the company allot the university with certain responsibility during their production. The interview survey shows that these foreign firms have linkages with university to acquire
technical talents they needed. Though the firms were not confined to recruit graduates in local universities, but most of them said the development and the huge low cost of high-quality human resource pool has been an attractiveness and local advantage for cooperation in R&D. Japanese case #1 had some collaboration experiences with local university. #1 actually had a relationship with a very famous technology university in Shanghai. The firm and the university, plus another local firm, built a R&D project in 2000. At that time, the firm hoped to acquire technology support from the university. However, because of management conflict between Japanese partner and Chinese partners, the project broke up and #1 turned to a famous company based in U.S. #7's manager said that actually Chinese university has the ability to do some design and development work, and if the work is subtracted to Chinese university, the development time can be shortened. However, all the development work is arranged by the headquarter firm, so they have no way to decide it. Another case is in #5, the manager recalled that once the firm needed a material experiment. At first, the Germany partner prefers to conduct the experiment in Germany, because they did not trust the Chinese university. Then the Chinese partner recommended visiting two universities to choose one that was able to do the experiment.

The second type is collaborative linkages with local enterprises: #12 and #13 have technical collaboration with chemical research companies on product development; #5 exhibit more inter-dependence with local firms in domestic distribution and marketing and has a value-creating horizontal relationship with a local SOE branch to set up storage and transport hub; #10 has a frame agreement with an local chemical logistic company aiming to perform more effective marketing and customer development through B2B online platform; #7 also established new factory by strategic alliance with another local small chemical enterprise, but fiercely independent approaches to strategy.

The third type is collaborative linkages with local government and authorities involved. #6, #7 and #14 established mainly informal or social-based collaborations with industry governance which are formalised through membership of the industry body, the Chinese Petrochemical Association, with its prime function being indirect. There is no
substantive cooperation between the member firms, but these relationships involve information exchanges in environmental issue, supplying/demanding and strategies of sales and marketing. #4, #5, #10 and #15 are involved in formal collaborations under strategic development program of the local government. For example, #4 has joined an important cooperation scheme of the company with the local industry association and another two joint ventures in Tianjin, aiming to further strengthen bilateral cooperation, actively promoting a new cooperation project among them.

**The types of resource transferring to local firms**

All the cases reported certain assistances or resources to local Chinese firms which confirm the existence of technology and knowledge resource transferred to local firms via on-going relationships with foreign subsidiaries. Overall, through vertical linkages or cooperative linkages, these foreign affiliates in Chinese petrochemical industry are apt to transfer a broad selection of product and technology related resources to local firms, such as financial resources, product samples and specifications, technical advice, direct assistance, staff training, market information, market analysis document, equipment, production and process technology.

A distinction is made between these types of resources based on the applicable nature: 'Technical/operational hardware' represents totally embedded knowledge, includes equipment and machinery in production, production and process technology including, organizational equipment and facilities which are used for handling non-production relations inside and outside the enterprise; the second type is 'knowledge' partially embedded knowledge, that is, patent, knowhow, various documents which possess an independent form but can only be used with particular facility or equipment, comprising documents relating to production criteria or secrets, strategic and operational documentation, marketing analysis and foreign market information; finally, production and organizational 'software' is un-embedded knowledge in the form of the experience, skills and know-how in production and management.
Comparing with 'hardware' and 'knowledge', 'software' resources are more beneficial for local firms because they can be more easily absorbed and applied into production or organization management. The impact of equipment and machinery transfer may be limited due to the information blockage from external and built-in computer programs. Impact of 'knowledge' transfer is expected low because the effectiveness highly relies on personal contacts with foreign employees who control local partners' access to these technologies and R&D content. Although considerable transfer found in these cases, impact of the knowledge embedded is limited by many factors. Although engineers and training have positive impact on local firms' production with increases quality of products, improved equipment utilization and higher productivity, few innovation and core technology were diffused to local firms. Additionally, these subsidiaries reported high reliance on personal contacts at management level and controls over which may obstacle the knowledge flow. Three relationship channels of these resource transfers will be summarized separately in the following tables.

**Backward resource transfer**

Table 5.7 summarized the resources transfer to the major Chinese suppliers. Four cases #1, #2, #8, and #17 reported none resource transfer to local suppliers.

The most common ingredient of current resource transfer via supplier linkages is 'knowledge'. It is common for foreign firms to provide product specifications and sample to local suppliers which related to the fact that the majority of locally owned firms carry out their activities following the requirements of buyers. Nine companies provide local suppliers the original specification of input and chemical formula which designed by foreign affiliate or the parent firm for production in China and home country. Two cases (#9 and #11) claimed it was unnecessary to transfer direct applicable knowledge but provide specification or set specific standards on their suppliers, such as in #9 'the products we purchase from Chinese suppliers are watercraft, volatile degree... So, capability and previous experiences in manufacturing these products are critical assessment for us to select local suppliers.' Other firms did not provide such resource mostly because these are standard chemical material and currently available
with local suppliers. Four cases had once provided production manual on the process control of local suppliers. In addition to production, #4, #5 and 15 also indicated advices or personal contacts on international market and export information.

Table 5.7 Resource transfer from foreign subsidiaries to local suppliers

<table>
<thead>
<tr>
<th>Case</th>
<th>'Hardware' transfer</th>
<th>'Knowledge' transfer</th>
<th>'Software' transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>2</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>3</td>
<td>None</td>
<td>Quality management manual to specialized products supplier</td>
<td>None</td>
</tr>
<tr>
<td>4</td>
<td>None</td>
<td>Product specification, Market information</td>
<td>Quality management training to 1 critical supplier</td>
</tr>
<tr>
<td>5</td>
<td>None</td>
<td>International market information, chemical composition to specialized product supplier, technology know-how to the equity-based supplier</td>
<td>Production and process assistance to 2 buyers</td>
</tr>
<tr>
<td>6</td>
<td>None</td>
<td>Technology licensing to equity-based supplier</td>
<td>Technical assistance, quality control management training to equity-based supplier</td>
</tr>
<tr>
<td>7</td>
<td>None</td>
<td>Specification, process technology</td>
<td>Irregular technical training for 1 specialized supply, production training and assistance to the contractor</td>
</tr>
<tr>
<td>8</td>
<td>None</td>
<td>Production standards/specification, to 2 suppliers</td>
<td>Assistance for international procurement</td>
</tr>
<tr>
<td>9</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>10</td>
<td>None</td>
<td>Specification, compound formula to equity-based supplier; storage and delivery technology to 1 critical supplier</td>
<td>Facility maintenances and application training, Technical assistance</td>
</tr>
<tr>
<td>11</td>
<td>None</td>
<td>Technical specification</td>
<td>None</td>
</tr>
<tr>
<td>12</td>
<td>None</td>
<td>quality control procedure manual</td>
<td>Process technology to supplier of specialized products;</td>
</tr>
<tr>
<td>13</td>
<td>None</td>
<td>Market analysis to equity-based supplier</td>
<td>None</td>
</tr>
<tr>
<td>14</td>
<td>None</td>
<td>Initial standard setting, specification</td>
<td>Technical assistance</td>
</tr>
<tr>
<td>15</td>
<td>None</td>
<td>Market information</td>
<td>Process training to equity based supplier; assistance to 2 other suppliers</td>
</tr>
<tr>
<td>16</td>
<td>None</td>
<td>Fixed specification</td>
<td>Technical assistance</td>
</tr>
<tr>
<td>17</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

Source: 17 company interviews
The 'software' transfer exists in terms of technical assistance and training in the way of movement of expertise and engineers. Eight cases have claimed they assist local suppliers in production and management. The experience and skills brought to local firms was associated with the very high standards prevailing in the petrochemical industry. For instance, #7 helped its contractor in the layout and organization of production facility; #5, #10 and #14 sent engineers to local suppliers to check equipments, procedure and solve problems at various stage of production. These cases have high requirements concerning the design and the quality of the product and on-time delivery, and they often impose quality control and help the suppliers with upgrading their production process through the training and the turnover of workers. Company 4, 6, 7, 10 and 15 also provided critical suppliers with training programs in quality management, organization management and hardware application. When companies provide equipments, technology know-how in production to local suppliers, this further induced the training on the suppliers' employees in how to use and maintain these resources.

Equipment hardware and financial transfer to local suppliers are rare in these companies, and only occur in linkages with equity-based suppliers. Case 10 provided critical process equipment to Chinese JV partner at very low price, while case 7 also made an equipment loan to the JV 'subcontractor'.

**Forward resource transfer**

Table 5.8 summarized the 17 cases' resources transfer to their major Chinese clients. Comparing with backward resource transfer, local customers and distributors seem to receive more substantially resource transfer from foreign subsidiaries than local suppliers do. Four cases reported none of backward transfer, whereas forward transfer has been found in all the cases. There are similar types of resource are identified in customer linkages as in supplier linkages. Local customers or distributors mainly benefited from technical advices, assistance, product specifications, staff training, and international market information.
### Table 5.8 Resource transfer from foreign subsidiaries to local customers

<table>
<thead>
<tr>
<th>Case</th>
<th>'Hardware' transfer</th>
<th>'Knowledge' transfer</th>
<th>'Software' transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>None</td>
<td>Technical specifications to 4 customers</td>
<td>Product application assistance to 2 clients</td>
</tr>
<tr>
<td>2</td>
<td>None</td>
<td>Overseas marketing and environmental knowledge to 2 customers</td>
<td>None</td>
</tr>
<tr>
<td>3</td>
<td>None</td>
<td>Technical advice in identification skills to 3 buyers</td>
<td>None</td>
</tr>
<tr>
<td>4</td>
<td>None</td>
<td>Overseas customer information, production specification to 5 clients</td>
<td>Training activities to 2 clients</td>
</tr>
<tr>
<td>5</td>
<td>None</td>
<td>Process technology introduction, product composition detail, international market information to 5 clients</td>
<td>Technical assistance, management training to 2 customers</td>
</tr>
<tr>
<td>6</td>
<td>None</td>
<td>Product specification to 3 clients,</td>
<td>None</td>
</tr>
<tr>
<td>7</td>
<td>None</td>
<td>Quality management manual to 1 client, export advice to 1 client, market knowledge by informal meetings</td>
<td>Processing assistance to 2 clients</td>
</tr>
<tr>
<td>8</td>
<td>None</td>
<td>Production specification to 3 clients, personal contact with market information</td>
<td>Design assistance to 1 client</td>
</tr>
<tr>
<td>9</td>
<td>None</td>
<td>Production specification, technical advices to 4 clients</td>
<td>None</td>
</tr>
<tr>
<td>10</td>
<td>None</td>
<td>Service software to 1 client and 1 distributor</td>
<td>Technical assistance to 2 specialized product buyers</td>
</tr>
<tr>
<td>11</td>
<td>None</td>
<td>None</td>
<td>Technical assistance to 3 clients</td>
</tr>
<tr>
<td>12</td>
<td>None</td>
<td>Management advice to 1 distributor, technical advice to 3 specialized product buyers</td>
<td>Product innovation assistance to 1 client</td>
</tr>
<tr>
<td>13</td>
<td>None</td>
<td>Advice on environmental management to 2 clients, export advices to 2 clients</td>
<td>None</td>
</tr>
<tr>
<td>14</td>
<td>None</td>
<td>Technical advices To 4 clients</td>
<td>None</td>
</tr>
<tr>
<td>15</td>
<td>None</td>
<td>Design advices to 1 client, input sourcing advice to 1 client, brand and reputation</td>
<td>Management training for 1 clients, assistance to 1 specialized product buyers</td>
</tr>
<tr>
<td>16</td>
<td>None</td>
<td>Technical advices to 4 clients</td>
<td>Quality management training for 1 customer</td>
</tr>
<tr>
<td>17</td>
<td>None</td>
<td>Technical advices to 3 clients</td>
<td>None</td>
</tr>
</tbody>
</table>

*Source: 17 company interviews*

In customer linkages, the mostly mentioned resource is production specification and technical advice. Twelve of the foreign subsidiaries provide chemical composition specification and processing technical specification which contains technical information. For instance, cases 10 and 12 have to change the process modelling to fit each customer’s requirements. Local firms always receive resources in terms of essential
technical services from foreign affiliates after transactions, which are reported more or less in 11 the cases. Including informal contacts, nine cases reported 15 types of technical advices mostly acquired by closely working customers aim to help them with product design and applicability in product development. In addition, foreign firms 5, 7, 8 and 10 provide direct assistances by sending engineer to intervene customer’s product design or production. Another important resource transferring to local customers suggested by only 5 cases was market-related information. In subsidiaries 6 and 16, managers provide experiences and information about overseas market; and subsidiary 6 also suggests customers’ complementary procurement; in #5, #7, and #8 there are informal diffusion during communication with knowledge from local agents or customers on access to larger customer base in China, and information about overseas markets providing local firms by foreign firm.

Intangible capability is reported exclusively in #15. The company establishes formal agreement with one of its local business customer, that the supplier’s name is show in the booklet of the buyer’s finished products. For the foreign affiliate itself, it is a marketing tactic, at the mean time, it create resources of brand name and reputation transferring to the local firm. The interview results also suggests that the diffusion of inward tangible technology along with local sales was quite weak, as identified by criteria such as using high quality components, the transfer of skills through the diffusion of technical information and training.

**Horizontal resource transfer**

By comparing the horizontal linkages with vertical linkages, higher variety of resource transferring to local collaborators with whom they have cooperative relationships are found than transactional relationships. Table 5.9 summarized foreign firms’ resource transfer to local collaborators. As long as the formal relationships are concerned, the 17 cases’ collaborations with local firms and organizations produce intensive resource sharing of finance, marketing information, technical personnel and skills. Particularly, ‘hardware’ and ‘finance’ transfer are more prominent in collaboration between foreign subsidiary and local firms and institutions. Most of these collaboration agreements
incorporate a two-way transfer of resources between foreign-owned subsidiaries and the Chinese collaborators. Local firms received direct applicable or embedded knowledge from foreign subsidiaries. The foreign firms on the other hand obtain customer base, management personnel and skills, specialized tooling or equipment from local partners.

Table 5.9 Resource transfer from foreign subsidiaries to local collaborators

<table>
<thead>
<tr>
<th>Type of collaboration</th>
<th>Content of resource transfer to local collaborators</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaborations with local institutions</td>
<td>Financial resource</td>
<td>5, 6, 10, 15</td>
</tr>
<tr>
<td></td>
<td>Technical assistances</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Production or research equipments</td>
<td>5, 6, 15</td>
</tr>
<tr>
<td>Collaborations with local enterprises</td>
<td>Financial resource</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Product/ process/ delivery technology</td>
<td>10, 12, 15</td>
</tr>
<tr>
<td></td>
<td>Export assistance, management /technical training/assistance</td>
<td>4, 7, 8, 13</td>
</tr>
<tr>
<td>Collaborations with local public</td>
<td>Market information, production knowledge</td>
<td>4, 5, 6, 7, 14, 15</td>
</tr>
<tr>
<td>authorities or government</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: 17 company interviews

Financial assistance and support seem to be an important type of resource in local collaboration between foreign subsidiaries and research institutions. By providing research fees and funding, four cases have subcontract experiment and development projects or parts of the projects to local universities or research institutions. Three case transferred production or research equipments to local institutions. Four cases operating product solution tasks provide patents, licenses, or copyrights to the research team formed by local universities or institutions. For instance, #10 said 'Local collaborator's technique capability and its current production system have good flexibility and adaptability for this project. We contribute complementary technology.' In #7, construction of its JV subsidiary plant and installation of production facility were subcontracted to the third party, but the project management team was cooperated by relative technique staff from both of the joint venture partners. 'It is natural course of sharing and exchange of knowledge about operating procedures and routines'. Six firms transferred unique market information or management skills through both formal and
personal contacts. In addition, #7 indicated current and future intents in cooperation with local competitors, such as joint bid overseas, trading agreement, and new product exploration. #14 mentioned that they would promote or conduct training programme with its current informal collaborators.

5.2 Statistical Techniques for Mail Survey Data

The last section of case studies aimed to careful analyses of foreign subsidiaries’ inter-firm linkages and strategies in China. The findings suggest that in addition to backward linkage, resource transfer which represents the potential for spillovers could significantly occur through collaborative activity with local partners and relationships with local agents and clients. The across cases comparison produced some hints on influential factors, particularly the ownership mode, country of origin and regional differences. However, case studies were not able to conclude on the propositions. Further analysis revealed that the quantity aspects of local linkages are not perfectly related to correspondent quality outcomes in local linkages.

In this section, the same types of linkages (backward, forward, horizontal) are under study, but the scope is expanded to cover all relationships with Chinese firms instead of only the most import ones. Two points obtained from interview results affect the propositions and questions in the mail questionnaires. Three types of resources provided to local firms are identified — ‘hardware’, ‘knowledge’ and ‘software’. In the mail questionnaire, respondents will be asked to provide their perceptions on each of the three types of resource transfer. Statistical analysis will compute the mean and recode the three dimensions into an integrated variable representing the overall degree of resource transfer. Case study summarized three major government tools aiming to facilitate local linkages: FDI (financial) incentives, local content requirement and government assistance programs. Respondents therefore will provide answers for each of them. After all, the presented results are gathered by means of a mail questionnaire, covering a total of 63 firms in the downstream petrochemical sectors.
5.2.1 Descriptive result of all variables

Before entering on regression analysis, it is essential to provide mean and frequency pattern of the variables to be studied. Table 5.10 displays the distributions of 63 foreign subsidiaries according to their country of origin, location and ownership type which are categorical variables in statistical analysis. There are more joint ventures than wholly-owned subsidiaries in the sample, and the ownership of most joint ventures has majority control by MNEs, for example, 71% of the joint ventures have over 50% foreign ownership. The average age of foreign affiliates is slightly higher than 7 years, although clearly, this varies considerably depending on different factors. The length of operation of the foreign affiliates indicates that these foreign firms are well-established in host China and have invested toward long-term.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joint ventures</td>
<td>36</td>
<td>42.9</td>
</tr>
<tr>
<td>Wholly-owned subsidiaries</td>
<td>27</td>
<td>57.1</td>
</tr>
<tr>
<td>Yangtze River Delta</td>
<td>22</td>
<td>34.9</td>
</tr>
<tr>
<td>Pearl River Delta</td>
<td>20</td>
<td>31.7</td>
</tr>
<tr>
<td>Bohai Rim</td>
<td>21</td>
<td>33.3</td>
</tr>
<tr>
<td>Japanese</td>
<td>20</td>
<td>31.7</td>
</tr>
<tr>
<td>Other Asian</td>
<td>16</td>
<td>25.4</td>
</tr>
<tr>
<td>Western</td>
<td>27</td>
<td>42.9</td>
</tr>
</tbody>
</table>

*Source: mail survey of 63 companies*

Two aspects of inter-firm linkage measurement are changed for mail survey. First, as the country of origin of local firms rose from earlier case-by-case analysis, respondents in mail survey were asked to answer the questions of local linkages and transfer involving Chinese-owned firms only. Secondly, instead of studying on five types of strategic orientation identified in the case study, this section focuses on local orientation of foreign subsidiaries’ value chain activities, that is understood as the extent of local sourcing and sale. These two variables are considered as continuous variables and are
measured by the proportion of sourcing and sale to local firms against total sourcing and sale.

In the sample of 63 companies, all of them reported direct supplier and customer linkages in China. Slightly more than 75% of firms purchase more than 50% locally; nearly 70% sell over 50% in Chinese market. The mean values of six dependent variables are displayed in Table 5.11.

<table>
<thead>
<tr>
<th>Table 5.11  Mean values of continuous and interval variables</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regional Location</strong></td>
</tr>
<tr>
<td>Yangtze Delta</td>
</tr>
<tr>
<td>Local sourcing (% total)</td>
</tr>
<tr>
<td>Local sale (% total)</td>
</tr>
<tr>
<td>Local collaboration number</td>
</tr>
<tr>
<td>Degree of backward transfer</td>
</tr>
<tr>
<td>Degree of forward transfer</td>
</tr>
<tr>
<td>Subsidiary age</td>
</tr>
<tr>
<td>Low cost</td>
</tr>
<tr>
<td>Local technological capability</td>
</tr>
<tr>
<td>Industry cluster</td>
</tr>
<tr>
<td>FDI incentives</td>
</tr>
<tr>
<td>Government assistance</td>
</tr>
<tr>
<td>Compulsory regulations</td>
</tr>
</tbody>
</table>

*Source: mail survey of 63 companies*

It suggests that collaborative linkages in China seem to less common than the other linkages, and there is also a difference between the other two linkages themselves. Specifically, linkages with local suppliers are on average the most important single source of input with an average 56% local sourcing in total purchase value. Similarly, domestic firms are the most important single sales destination. Comparing with each other, extent of local sale is higher than extent of local purchase, which may imply more important potential of local effect via forward linkages. Consistently, the degree of
technology and knowledge diffusion is strongest via forward linkages, following by horizontal linkages, and the weakest channel is the backward linkages.

The mean values of local sourcing and sale of western companies are significantly higher than the Japanese and other Asian companies. Western countries also show a slightly higher degree of local collaboration number and vertical resource transfer to local firms. Regarding to the location dimensions, firms in Bohai Rim show higher local orientation, whereas firms in Yangtze Delta reported higher degree of resource transfer in all types of linkages. Except the degree of forward resource transfer, the other four linkages variables are scored higher in joint ventures than wholly owned subsidiaries. Mean value of responses' reflection on a series of location-specific factors suggest comparisons between three regions that have different conditions. It can be seen that, similar with finding in case studies, the most highly rated factors are 'low cost' with a moderate level (scaled from 1 to 5) at 3.4. 'Local technological capability' and 'industry cluster' are better scored in Yangtze River Delta, and the evaluation of 'cost' is lowest in Bohai Rim, whereas Pearl River Delta is attributed by the most 'FDI incentives' of government.

5.2.2 Selection of regression models

Multiple regression models are used to examine on the factors likely to affect local orientation, collaboration and resource transfer. All estimations were performed in SPSS. Given the nature of dependent variables, different regression models are applied. As the change in local orientation measurement varies between 0 and 100% which can be considered as continuous data, MLR (Multiple Linear Regression) analysis is therefore used. The Ordinal Logistic Regression (OLR) model is then applied to test the power of predictors on the degree of resource transfer, and local collaboration intensity. As discussed earlier, considering shortcomings of the count variable, local collaboration intensity is converted using ordinal categorical measurements. Two additional OLR estimations using alternative versions of local collaboration variable (see section 4.6.2) are carried out and generated the same tendency after all. The regression models provide statistical evidence for the relationships between the local linkages and the series of
factors presented in the framework developed earlier. Selecting model variables on a theoretic basis and using the ‘Enter’ method provided by SPSS is preferred.

The propositions formulated on the influence of various firm- and location-specific factors are tested by MLR (for ‘local sourcing ratio’ and ‘local sale ratio’ variables) and OLR (for ‘number of local collaboration’ and ‘degree of resource transfer’ variables). The similar analysis process between MLR and OLR in SPSS is that they are run against the reference category of the independent variables, and therefore the comparisons of other categories need to be conducted by the same model but in separate outputs. Appendix 5 presents the results of multiple regressions with combination of independent variables.

5.2.3 Reliability and validity

As in most other statistic methods, a number of conditions need to be met when using linear regression. There are two important conditions. First, normality and linearity (Appendix 4) is satisfied with the data in this research. Although OLR is part of a category of statistical models including MLR and ANOVA, the independent or predictor variables in OLR can take any form, and OLR makes no assumption about the distribution of the independent variables which enables the researcher to overcome many of the restrictive assumptions of MLR regression, such as normality and linearity. The latter advantages is more important considering the non-randomly sample method in current research. There is a critical assumption for the both the methods is ‘the absence of multicollinearity’. VIF values exceeding 5, indicates serious problems of multicollinearity (Gujarati, 1995). To evaluate the severity of multicollinearity, the diagnostic statistic of variance inflation factor (VIF) was applied in the first MLR model. The test find a problem exist between the location variables ‘infrastructure’ and ‘industry cluster’. The VIF value of slightly over 5 suggests that these two variables are closely interlinked with each other and implies that a location with ‘industry cluster’ is usually characterized by advanced infrastructures. Therefore, ‘infrastructure is removed from the factors list. Hence, the multicollinearity is not a problem in this research.
In spite of the acknowledged traits, triangulation method cannot ensure the validity and reliability in the entire research, particularly concerning the common method variance (CMV) (Podsakoff et. al., 2003; Schwarz et. al., 2008; Chang et. al., 2010) which is recognized as the problematic issue in survey-based studies. In this research, the dependent variables were drawn from the objective numbers about local sourcing, sale and collaboration relationships. In addition, a part of the interviews and questionnaires were carried out with different managers in those companies. Sources of CMV were then discounted to two in the quantitative stage of this research: single rater in some of the respondent companies, and consistency motive of each respondent. In order to examine this construct validity, Harman’s single-factor as one of the most rigorous test (Podsakoff et. al., 2003) is conducted to ensure that there was no common method variance. The procedure involves conducting a confirmatory factor analysis using principle axis factoring (Fabrigar et. al., 1999) to examine whether one factor accounts for the majority of variance. Total variance table (Appendix 4.2) revealed nine factors with Eigenvalues greater than 1.0 and a cumulative variance of 85.65%. The first factor accounts for 23.56% of the variance which is less than the critical cutoff value of 25% (Williams et. al., 1989), and this suggests that common method variance was not a significant detriment to this research.

5.3 Integrated Findings from Case study and Statistical Analysis

In this Chapter, case studies and a series of logistic and linear regression models were performed in order to analyze the inter-firm linkages between MNE subsidiaries and local firms in China’s petrochemical industry. As explained in Chapter Four, objective of company case studies is to provide in-depth information about interviewed cases’ local network attributes that used as suggestions and reference for questionnaire design in subsequent survey. The subsequent regression analysis for mail survey data of 63 companies assembled results added robustness and reinforced the tendency found in case studies without denying the impact of the surveyed factors and emphasizing the
significance level. This section integrates findings from the two methods, and present in order corresponding to the research questions and propositions.

5.3.1 Existence and level of local linkages in China

The above analysis of vertical and horizontal linkages 17 cases identified various local firms including, customers, suppliers, agents/distributors, local alliance partners, institutions and government. The general attitude toward local linkages varies ranging from case 1 which was aiming for independence in local supply, through companies such as #5 and #6 which made extensive use of contract with local petrochemical suppliers and focussed primarily on local relationships for market channels, through to case 10, which used local relationships to help to grow the partners generally in its local networks. The following parts in this section will find out evidence from comparative case groups controlled on these factors. Consequently, these results could help derivate the difference across cases and gauge support for the propositions.

Various types of resource transfer are mainly described in case analysis. Financial transfer to Chinese-owned suppliers is virtually non-existent. Equipment or machinery transfer seldom occurs via vertical linkages. ‘Knowledge’ to ensure supply quality and deepen customer relationship is the most frequent resource transfer. It includes product- and production-related specification to local suppliers; and technical advice and market information to local customers. Equal embeddedness has not been projected into MNE subsidiaries’ human resource, R&D, management and administration. Integrating with regression result, the degree and advancement of overall resource transfer are found to be very limited. The survey finds that nearly two-fifth of foreign firms in the petrochemical sample provide local suppliers with the standard specification only, or do not have any resource transfer to local firms. When foreign subsidiaries do transfer knowledge via backward linkages, the degree of this transfer varies significantly. The cooperation level in China is low and many of these collaborations are based on informal contacts rather than agreed or contracted relationships with defined resource sharing. It also suggests that collaboration is significantly facilitated by local
transactional linkages. Once foreign firms are highly localized in procurement and sale, they tend to have more locally collaboration.

The most relevant variables between each other for simultaneously explaining the variation of three linkages characteristics are, country of origin, subsidiary age, regional locations within China, and location-specific factors including industry cluster, local technological capability and government assistance; the moderate factors referring to those only have significant impact on strategic orientation include ownership mode, low cost and compulsory regulations; another government role in terms of FDI incentive does not show any significant estimation. Following this summarization, each factor will be discussed specifically.

5.3.2 Impact of selected factors on local linkages

Interviews are insightful to understand how complex the situation behind the linkage establishment and resource transfer. The quantitative analysis is able to highlight the firm and location-specific factors that matter for MNE subsidiaries’ IFLs, and different roles of them in explaining the variation of local linkages. Table 5.12 gives summary statistics results in all the models used for these econometric analyses.

Table 5.12 Regression estimations for the influential factors of linkages variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Local sourcing</th>
<th>Local sale</th>
<th>Backward transfer</th>
<th>Forward transfer</th>
<th>Local cooperation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership mode</td>
<td>.00 (.045)</td>
<td>.32 (.021)</td>
<td>.69 (.344)</td>
<td>.35 (.851)</td>
<td>.06 (2.687)</td>
</tr>
<tr>
<td>Subsidiary Age</td>
<td>.47 (.001)</td>
<td>.00 (.009)</td>
<td>.25 (-.124)</td>
<td>.00 (.526)</td>
<td>.09 (.227)</td>
</tr>
<tr>
<td>Western-Japan</td>
<td>.04 (.031)</td>
<td>.52 (.016)</td>
<td>.03 (2.172)</td>
<td>.38 (1.023)</td>
<td>.02 (3.349)</td>
</tr>
<tr>
<td>Asian-Japan</td>
<td>.46 (-.010)</td>
<td>.98 (.000)</td>
<td>.44 (.691)</td>
<td>.51 (.788)</td>
<td>.42 (.989)</td>
</tr>
<tr>
<td>Western-Asian</td>
<td>.01 (.045)</td>
<td>.67 (.012)</td>
<td>.12 (1.481)</td>
<td>.70 (.513)</td>
<td>.18 (1.672)</td>
</tr>
<tr>
<td>Yangtze-Bohai</td>
<td>.16 (-.019)</td>
<td>.00 (-.067)</td>
<td>.01 (2.785)</td>
<td>.00 (8.002)</td>
<td>.00 (3.233)</td>
</tr>
<tr>
<td>Pearl-Bohai</td>
<td>.04 (-.028)</td>
<td>.00 (-.091)</td>
<td>.77 (.357)</td>
<td>.03 (3.273)</td>
<td>.11 (2.317)</td>
</tr>
<tr>
<td>Yangtze-Pearl</td>
<td>.42 (.018)</td>
<td>.61 (.020)</td>
<td>.01 (3.142)</td>
<td>.05 (4.134)</td>
<td>.05 (4.498)</td>
</tr>
<tr>
<td>Industry cluster</td>
<td>.01 (.025)</td>
<td>.00 (.048)</td>
<td>.01 (1.916)</td>
<td>.01 (2.196)</td>
<td>.02 (2.125)</td>
</tr>
<tr>
<td>Local technological</td>
<td>.12 (.016)</td>
<td>.44 (.014)</td>
<td>.01 (2.387)</td>
<td>.05 (1.523)</td>
<td>.02 (1.951)</td>
</tr>
</tbody>
</table>
The first row of investigated factors is Ownership mode. The result confirms the findings in case study: JVs are tentative to source and sell in China, and are tentative to transfer knowledge or technology to local firms than WOSs although the effect is limited. All regression models indicate strongly positive relationships between the partial ownership of foreign affiliates and local sourcing with strong significance (P<.05). Unlike the general conclusion in the case study, the ownership mode is insignificant to explain the intensity of local collaboration in regression estimation. The insignificant role of ownership mode is consistent with case study result, which indicated that degree of resource transfer is not closely related to MNE's entry mode.

Case study was not able to tell the accurate influence of subsidiary age, whereas regression models show positive and fairly significant role of this factor in shaping local linkages characteristics. The age of the subsidiary in China that reflects how long it has been operating in China was found significant in MLR models of local sale extent, degree of forward transfer and number of collaborations, but insignificant implication for backward linkages. The results imply that the longer time spent in China by the foreign subsidiary, the more likely they create relationships with local customer and started transfer knowledge to local clients.

Concerning the country of origin, whether subsidiaries belong to western, Asian or Japan parent seems to make substantial difference. The complex differences of local linkages exist between western and Asian companies. Overall, case comparison results are reinforced, confirming expectation that country of origin of MNE is a key factor in the explanation of backward linkages and local collaboration. With good significance level, regression estimates indicate that western companies are more likely to transfer...
knowledge and higher degree of transfer to local suppliers. There are no significant differences in most of the local linkage characteristics between Asian and Japanese subsidiaries although the former displayed higher local orientation and transfer than the latter group. Japanese subsidiaries, as expected, have the weakest local involvement in collaborative relationships than the other categories, but the difference is only significant when comparing with the western category.

The regional locations in China exhibit large disparities in the five independent linkage variables, although variances between locations are complex. First, consistent with the descriptive analysis, comparing with Bohai Rim, Pearl River zone stands out for the significantly less sourcing and sale with local firms, which suggest firms in this region are more tentative to import and export. Second, subsidiaries in Bohai Rim are more likely to serve local market than those in Yangtze Delta, but Companies in Yangtze Delta reported most intensive local cooperation and coefficient has significant sign comparing with the other two locations. There is no significant difference in local orientation between Pearl River Zone and Yangtze Delta. Regarding to the resource transfer outcome, higher degree of resources transfer is likely to occur in Yangtze Delta than in the other two regions. The significant differences of transfer have found between Yangtze Delta and Bohai Rim cases toward three types of linkages. Significant differences also exist between cases in Yangtze Delta and Pearl River Delta toward backward transfer. Therefore, location is a key factor to explain the existence and degree of resource transfer, implying that subsidiaries that have higher potential for resource transfer via local linkages particular concentrated in Yangtze Delta.

The regional differences in terms of specific location-specific factors have shown important effect on local linkages formation. 'Low cost' is significantly affect local orientation of sourcing. The overall effect of agglomeration economies (the industry cluster variable) is highly significant and important in all specifications of local linkages. Another important factor is the availability of strategic resources (i.e. local technological capability) which have significant impact on strategic outcomes (i.e. resource transfer and local collaboration). 'Incentive policies' of government (e.g. tax incentives, initial
allowance, and government facilitation program) exerts a weak positive effect consistently in local linkages. 'Regulation' (e.g. local content requirement, foreign ownership restriction) is only significantly related to 'local orientation of sourcing. Government’s assistance (or facilitation programs) is significantly positive in the explanation of local sourcing orientations and local collaboration.

**Subsidiary’s ownership mode**

The strategic orientation of foreign subsidiaries differs by the ownership mode. This is particularly true with regard to the local sourcing, which seem to be more local-oriented in JV cases whereas import-oriented in WOS cases. Except #8 and #9 that have no input supplies from the Chinese JV partners, the joint ventures have critical relationships with their local parent firm. They were very successful in achieving production localization with the average extent of local sourcing at 68%, whereas 47% in WOSs. Among the seven local embedded subsidiaries (S3), four are Ns. By contrast, there are two JVs among the seven import-oriented cases. Specifically, between comparative cases #5 and #12:

*JV case #10 illustrated that its strategy was not just about obtaining resources, but involvement in the entire local value system. The WOS #12 had an intentional strategy based on a mandate to source specialized chemical from the Asian market for its parent’s international portfolio or assign internal purchase by MNE corporate including critical equipment and technology.*

Similar result can be found in another pair of cases,

*#17 is a major chemical enterprise in Tianjin municipality and tends to be highly involved in vertical transactions within China. However, nearly half of the local purchase ratio (27.3%) was supplies within corporate networks and other Japanese firms in China. Case 17 also emphasized strong dependency on parent firm to ensure the quality of critical input, operational process and strategic resources. Counterpart JV #13’s local procurement accounted 65% though approximately 15% of total input was purchases from sister-subsidiary in China. But encouraged by the local*
demanding, the respondent indentified growing external arm-length transactions with Chinese firm instead of Japanese affiliates during the decade in china.

Linkages with the Chinese suppliers are particularly long-term oriented in JV cases as opposed to medium to short-term relationships established particularly in WOS cases. 7 out of 9 JV cases identified at least one long-term relationship which is usually established with JV partner. By contrast, of the nine WOSs, only 3 of 8 WOSs identify the existence of long-term linkages with Chinese suppliers.

2 JV cases #5 and #14 receive exclusive supply of most critical input from Chinese JV partners, which termed in their JV agreements. JVs #5 and #10 had 3 and 4 Chinese suppliers based on a long-term contract including equity-based suppliers, especially these relationships in #5 has been built since establishment of the subsidiary. Of the WOS counterparts, #7 indicated one long-term supplier relationship, and #12 only has medium-term supplier relationships in China. The other WOS cases claimed that they generally tend to diversify their suppliers in order to guarantee the security and the stability of the supply and to maintain the price competition between suppliers.

However, as the exceptions:

Two JVs, #8 and #9, only agreed to comparatively medium or short purchasing contract with local suppliers though long-term orientation in the future was announced by the managers. They purchase abdicative material of smaller portion from independent Chinese petrochemical distributors chosen to reduce distribution cost and risks. Meanwhile, #8 cited that long-term relationships were hindered because their concern in the lack of quality and technical expertise in local suppliers.

The differences between JV and WOS in local sale orientation are less pronounced, however on average, JVs shows the higher share with 10% more than wholly owned subsidiaries. This moderately implies that WOSs have higher export-orientation toward
Asian and global markets, while the JVs tend to derive most profit at local market. Amongst five types of strategic orientation, 5 out of 8 WOSs are export-oriented and have stronger relationships with overseas customers. Secondly, WOSs tend to focus on marketing in metropolises, rather than to spread their distribution to cover a wider geographical area, whereas JVs draw their revenue from serving fragmented markets all over China. For instance, #5, #6 and #14 have established a number of direct customer relationships over a large area including small cities and towns. In comparison, their WOS counterparts concentrate marketing in metropolitan cities and integrated markets in order to reduce the cost of complex distribution and transport, or they chose to rely on local agents to increase market coverage.

The market scope somewhat modified foreign subsidiaries' uses of intermediates in forward linkages. With respect to this issue, most of the cases claim preference to have direct linkages with their important local buyers. However, they are tentative to form external linkages with intermediates that have marketing and distribution capabilities and to obtain exclusive access to additional distribution systems. As involvement of local Chinese firm who have mature and broad distribution channel in China, JV cases had employed Chinese distributors chosen by the Chinese partners, whereas WOSs prefer to internalize distribution within the MNE, for example, #1, #2, #4, #13 and #17 identifies none of external distributors and the sub-units of the MNE in China are responsible for their local marketing and sale. #7, #12 and #16 entertained relationships with foreign-owned agents or distributors. Comparatively, JV #6 mentioned that 'partnerships with Chinese firm increase our market portfolio but discourage us to set up own distribution channels'.

Regarding to collaborative linkages, there is a moderate difference between JV and WOS. JVs are the dominate players who are more apt to result in local collaborations. 7 out 9 JVs have local collaboration whereas less than half of the wholly WOS have no such linkages. JV established collaborations in various aspects with local Chinese firms
and institutions including supply, marketing, distribution and R&D activities. Regarding to the type of collaboration, JV cases are more likely to subcontract or work together with local universities in R&D projects, whereas WOS are usually entitled the rights to pursue these activities inside of the MNEs. However, these companies are not convinced to conduct R&D collaboration with local firms, especially for WOSs, for example, #1, #2, and #17, because their R&D activities were controlled and carried out by parent firms, it was not possible for them to build relationship with university and research institute for R&D. For WOS #7, the company does not trust Chinese university can fulfil the R&D work. JVs i.e., #5, #10 and #15 have technological linkage with universities mainly because their Chinese partner had a long-term cooperation with universities. These JVs ventures actually retain the previous relationship with university and research institute established by the Chinese partner.

There is no strong evidence suggesting that JVs transfer higher degree of resource to local firms than WOSs do. The overall level of resource transfer via supplier linkages is slightly higher in JVs, but mostly takes place in relationships with the equity-based supplier (the JV partner) in order to comply with rules of contract; JVs also show the best and worst result in transfer via supplier linkages. Interviews found that the most direct knowledge and technical assistance transfer via supplier linkages were conducted by JV cases. 4 of 8 JVs reported provision of critical equipment, technology know-how or patent regarding to the chemical production and frequent assistance to equity-based and some of non-equity-based suppliers. On the other hand, two JVs have the least resource transfer:

JV #9 do not transfer particular technology or knowledge to indigenous suppliers, and JV #8 reported fixed product specification because these two foreign investor use local partners mainly as it distribution agents and local purchase maintains very low, which some technology and skill transfers are blocked.
Regression outcomes confirm the significant role of partially ownership of foreign subsidiary in fostering their local sourcing. But no significant effect is found on local collaborations and consequent resource transfer via these linkages. Specifically, partially-owned foreign subsidiaries appear to be associated with higher value chain activities while full foreign ownership is correlated with lower within host country. Reversely speaking, the more an investor aspires towards local relationships with upstream and downstream value chain, the more likely the investor will be to choose a joint-venture mode in FDI. Foreign subsidiaries are inclined to select state-owned enterprises as their JV partners when pursue local orientated sourcing strategies. SOEs accounted for more than 46% and 52% of the interviewed cases respectively in local sourcing/global access and local embedded subsidiaries.

**Subsidiary’s country of origin**

In terms of strategic orientation of sourcing, the western companies have the highest local procurement, averagely 63%. Firms originating from Japan and other Asian countries showed insignificant difference of local sourcing at 51%. 6 out 10 Japanese and other Asian subsidiaries have import-oriented (S1, S2 and S5) sourcing. They imported more than half of input from home market and also their production facilities and technologies were strongly dependant on parent firms or suppliers in home markets. Only Germany case #12 is global oriented toward both input and output. In practical terms, the US and European subsidiaries are keen to become involved in local networking than Japan and other Asian originated firms. The Japanese firms are strongly reliant on intra-firm imports of materials and hence relied very little on backward linkage with local firms, whereas the US and the European firms showed a strong tendency for backward linkage with local firms. Korean and Taiwan subsidiaries also exhibit the lower degree of local purchase, where even Japanese companies are far behind other Asian firms companies. The interviews revealed the changes of local sourcing strategy which would potentially change the parallel between firms of different nationality.

*Statistics data of the Taiwanese cases 11 and 15 show increasing level of local sourcing due to the booming of China host market and economy*
dilemma in Taiwan. #11 also intends to 'employ technology professionals and establish cooperative technical projects with another local SOE company in the mainland'. Whereas Japanese case #1 and #2 identify no important changing regarding to local linkage promotions.

Forward linkages with local Chinese firms exhibit moderate diversity along foreign investors' country of origin. First, Asian origin subsidiaries do appear to be more internalized toward distribution than western cases, for example:

*Three Japanese cases #1, #2 and #17 had own sales force or reply on sister-subsidiary for distribution which caused higher physical distribution costs than western cases.*

Second, comparing with European and US cases, Japanese and Asian companies are more likely to export to home markets instead of exporting to various overseas markets.

*Japanese firm #1, #2, and Singapore firm #4 indicated certain portion (20%-25%) of sale back to parent firm and other clients in home countries, but host market is still the largest recipient of its local made products.*

The average number of local collaborative relationship is very close between Non-Japanese Asian and other Western subsidiaries, but slightly lower in Japanese companies. 6 of 7 western cases have or had significant collaboration in past three years, whereas 2 out of 5 Japanese cases and 4 out of 5 other Asian companies reported local collaborations. However, the content of collaboration show distinction between them, particularly R&D collaborations with local organization are evidently weak in Asian subsidiaries. Among the seven cases having R&D collaborations, five of them are western-based subsidiaries. The influence of country of origin is not clearly shown with regard to other types of collaborations. Japanese and other Asian companies, relative latecomers in the globalization of R&D, rely on home development, licensing and listening posts to acquire technology before expanding R&D investments overseas.

Nationalities of the firm show impact on the changes of backward resources transfer. Knowledge diffusion from Western subsidiaries seems to be more intensive than from
Japan firms and the least from other Asian-invested firms. Western companies denoted openness toward technology transfer in their activities and words, thus reported the most intensive and various resources flow to local suppliers including explicit technology and know-how, technical engineers and advices, or by training engineer for local suppliers. For instance, Germany firms #5 and #7 provided local suppliers with the know-how of production and operation process identical with our most advanced plant in Germany. Transferring 'hardware' equipment based on discount price is also identified in #7 and in #6 as licensing of technology patent. #6 suggested that the company taken the advantages of the existing research capacity of Chinese partner in order to cooperate in product and process technology development. Whereas the most common resources transfer found in Asian-invested counterparts #1, #2 and #17 indicated none backward transfer, or limited to production standard and informal advices. #2 cited its caution to technology diffusion 'positively transfer knowledge of products and operation only when we believe our own ability to sell petrochemical in China is not adversely affected in long-term'.

The import orientation and the less resource transfer of Japanese cases may be attributable to their discretion for tent to form long-term relationships and supplier selection strategy. Of the seven western subsidiaries, five have long-term supplier linkages with Chinese firms. On the contrary, Japanese and other Asian firms prefer medium to short-term contract with local suppliers. Western cases claimed less appeal for vertical internalisation and thus have higher autonomy of supply and marketing, vis-à-vis foreign affiliates of Japanese and Asian MNEs are found to be strongly integrated within MNE corporate networks and influenced by the parent firms, for example, Firms of Asian origin, e.g. #1, #8, #17 seem to be more dependent in their overall procurement strategy, not only in terms of internal supplies, but also their supplier selection was strongly intervened by the parent MNE. #2 had very low level of independence in decision-making and only carried out the orders of the headquarters in China, which implies that it is
effectively isolated from the local business community and rather to import
critical input from Japan.

Moreover, Japanese firms also tend to purchase from same-country firms or sister
subsidiaries which are consistent with the low orientation toward local sourcing found in
the earlier section. Such cases include:

"#8, #9 and #17 reported priority to make sourcing with same-country or
other intra-MNE subsidiaries in China. #1 and #2 also suggested much
concern about the presence and word of 'compatriot' companies when
choosing investment location."

The restrict capability-based criteria of supplier selection may also contribute to the
lower degree of resource transfer in Japanese cases, for example,

"#17 disclosed that 'unless such local Chinese firms are capable for
material goods of reliable quality and have previous business relationships
with other multinational firm in China', hence there is less need for this
company to provide additional technology and skills"

Finally, western and non-Japanese Asian subsidiaries show higher level of personnel
localization than Japanese firms do, particularly in production or supply management,
which may affect their preference on local suppliers.

"Japanese companies #1 and #17 did not allocate critical management
positions to local employees. Comparatively, western counterparts #7 and
#3 had hired Chinese managers in more top or middle management
positions including procurement, planning survey and manufacturing."

**Subsidiary age**

By studying the 17 cases, operation history in China is found more tentative to establish
long-term oriented relationships with local firms.

"In cases 6 and 10, the most important reason to be long-term oriented with
Chinese non-equity based suppliers was recognized as a heritage from the
former planning system or experience in China, which bestowed special
benefits to foreign subsidiaries."
However, cases having the longer time in China reported both increase and decrease of local sourcing:

In two U.S. cases (#7 and #14), their parent company firstly centralized regional purchasing in home country or other Asian countries, mostly in Japan or Korea. But the move to China was made to save costs and resort for the growing Asian and particularly Chinese market. This move result the decline of their imports. Slight decrease of local sourcing also found in the long-experience cases (#5 and #9) because these foreign buyers in Chinese market have increased buying from overseas suppliers, as well as newly established internal suppliers and sister plants.

Time factor has no clear influence on the sale orientation. The local sale ratio of a few cases had been developing toward opposite directions:

#17's local sale have rise by 30% in last five years because the increasing demand in China. With four years of establishment in Shanghai #10 had rapid strides both in local sale and export in 2005 when the parent firm closed another subsidiary in Malaysia. #13 made successful entrance in other overseas countries by improved production technology and scope meanwhile decrease local sale by 8% comparing to year before interview.

There seems to be a tendency however, in older subsidiaries to create more local collaborations in the last three years. #5 and #6 among the early entrants reported three collaborative relationships. As company 6 commented,

The subsidiary increased its knowledge of the local business environment and obtained fully control of the subsidiary. Meanwhile, the MNE established a new WOS research centre suggesting the corporate localization strategy in China.

Regressions confirm that time factor has a significantly positive impact on sale orientation and forward resource transfer. The effect of age of foreign affiliates on their local sourcing tends to be weak. The time factor is found on the other hand strongly
affect local orientation of sale. It is difficult to highlight a clear distinction of resource transfer occurrence according to the time factor while regression tests find the longer the foreign MNE has been present in a host country, the higher is the knowledge transfer via forward linkages. To local clients, the longer the subsidiaries have been established in China, the more likely to provide additional training to upgrade production and management skills, for example, ‘staff training’ and ‘production or export-related assistance’ particularly contribute to the increase of overall forward transfer.

**Regional location and location-specific factors**

There is stronger suggestion provided for the impact of locations on MNE subsidiaries’ inter-firm linkages. The comparisons could draw out the significant changes of strategic orientation across regional locations. Companies in Bohai Rim are mostly local orientated toward supply and sale, following by Yangtze Delta as the second and Pearl River Delta is least. It can be seen that the cases in location Yangtze Delta and Pearl River Delta indicated more connections with foreign firms both overseas and locally. 5 out 8 cases in Bohai Rim are local embedded subsidiaries (S3). On contrary, 5 out 7 import and export-oriented counterparts are located in location Yangtze Delta and Pearl River Delta. Strategic orientations are more complex and overlap between Yangtze Delta (Shanghai and Jiangsu) and Pearl River Delta (Guangdong). There could be multiple reasons why some firms exhibit less linkage and technology transfer to local Chinese firms.

The difference is then found regarding to geographic scope of customer relationships within China. Local market potential in proximate area undoubtedly results in higher local sale of foreign firms in China. Cases in Bohai Rim have a relative preponderance of key buyers in the same city or within the province, whereas counterparts in Yangtze Delta particularly Shanghai have more national-wide linkages. This somewhat can predict that foreign firms in more developed industrial locations, with its specialization and concentration in petrochemical production which is characteristically interwoven with other industry at national level, would hence produce more relationships in wider scope. For instance,
The largest local supplier of cases 4 and 6 in Bohai Rim are located in the same city, whereas marketing networks of counterparts. #11 commented that the plant was established aiming to provide clients and customers benefit from closer support on shorter delivery times and a higher level of technical service. #5 in Pearl River Delta and #10 in Yangtze Delta reached more important customers located in other regions in addition to local ones in the same region.

From the demand respect, foreign investors embedded in a location with substantial customers or the market size is mostly active in local sale activities. Firms having only market-driven linkages are more concerned with maintaining a good relationship with certain actors in the networks, notably the buyers. Bohai Rim has become the most potential inland market; Yangtze River Delta has the highest density of population and proximity to inland market; whereas Pearl River Delta has relatively saturated market. Hence, foreign firms in Bohai Rim and Yangtze Delta are more tentative to build extensive sales channels.

The level of backward knowledge transfer seems to be the highest in Yangtze River Delta among the others. Three types of resource transfer to local suppliers were identified by #7 and #10 which are located in Yangtze River Delta. Three out four cases reporting no backward transfer are located in inland cities of Bohai Rim. Existence of 'software' resources clearly influenced on the variety of forward resource transfer. Only one case #4 in Bohai Rim report technical training for the largest two customers in China, whereas those eight companies providing training or assistances for local customers’ production process are all located in Yangtze River Delta and Pearl River Delta. Local collaboration mostly concentrated in Yangtze River Delta. Four out of five cases in this region have more than one collaborative agreement with local organizations. Half of those companies in Pearl River Delta and Bohai Rim were not involved in any local collaborative linkages.
In the analysis of early chapter, locations of these cases are divided into three regions according to economy and industry differences that derived from preliminary research in Chinese petrochemical industry. Comparison between locations can reveal several factors that contribute to the regional difference and local linkages characteristics of foreign companies in these locations:

Considerable variations have been found between the in the pattern of supply chain activities between individual MNE subsidiaries within a region. The level of local sourcing is lower in Pearl River Delta than in the other two regions; more intensive collaboration are exhibited in the highly industrialized region, Yangtze Delta; Yangtze Delta has also shown higher degree of vertical resource transfer and particularly higher than Bohai Rim. Companies’ perceptions on regional environment confirmed that within china there are large variations between the three economic regions, and the regional differences consequently affect the pattern of foreign firms to work with local firms. It is difficult to highlight a clear distinction of type of transfer occurrence according to the regional location of the foreign subsidiaries. There is a significant tendency in Yangtze Delta to create stronger collaborations and resource transfer to local firms in Bohai Rim, while Pearl River Delta is between. The statistical results show that the differences in local linkages are influenced by location-specific factors that endow regional locations with different business environment. But these factors exert significant or lower impacts. The location is furthermore the reflection of host country environment and business potential in the country or region. This research confirms the need for appropriate local conditions to optimise the benefits from local linkages.

**Government role**

Interviews identify a few of examples of incentive-based instrument and compulsory regulation targeted the formations of linkages between foreign firms and local industry, as well as general FDI policies that show effect on local linkages. However, current instruments of local government in China are not always powerful to the intensity of local linkages when comparing cases in terms of their location.
General FDI incentives have been commonly used in China. Many cases (14 of 17) reported that certain favourable policy toward FDI had been important motives for establishment in China, such as government support, financial incentives, allowing merger and acquisition, duties elimination on certain equipment import. While these tariffs and tax incentives aim to attract more FDI, they do not necessarily result in high level of neither local orientation, nor show direct facilitation on resource transfer to local firms, for example,

Four import-oriented firms in SEZ of Pearl River Delta (#1, #2, #12 and #16) reported that low import duties had impact on their sourcing decision-makings. #1, #8 and #9 indicated that tax incentives and policy support of having a local partner is the most important reason to form the equity-based relationship with local firms.

Concentration of foreign firms encouraged by free trade policy in SEZs may affect the preferential linkages with foreign firms. For example,

#16 has been linked with other customers from Taiwan which lead them to follow into the mainland market and establish new relationships with them. This motive therefore could explain why #17 purchased over 40% of input from Taiwan-invested suppliers located in the same city.

Given SEZs in Pearl River Delta proximity to Hong Kong and other internal markets, as well as its preferential system of tariffs for exports and the lack of quota restrictions, cases in these locations maximises the subsidiary’s export to foreign markets outside of china. This was a strategy of the company to look beyond its current stance and to become a more global company.

Sourcing with foreign firms was identified in #12 that also had 30% of sale to with regional headquarter in Hong Kong.

The Chinese government’s requirement on joint venture arrangement was mentioned by three JV cases, which has historically been one of the main reasons to form equity based-linkages. A few of other cases #1, #2 and #9 reported that they were not given strict requirements of local content. 10 out of the 17 firms indicated that local content requirement affected local purchase decisions since the plant has been established.
While there does not appear to be any explicit local content requirements on chemical sector, in any published national or local Chinese regulations, #15 commented that there exist in internally circulated administrative directives that restrict the import of certain equipment component. Although this requirement was eliminated, the local content of most cases has not declined significantly. For example, in the following cases:

#7 indicated that in the early stage of the open-policy in China, local content requirement, import tariff and ownership restriction had shaped its high level of local sourcing. Although these regulations have been eliminated gradually, high local dependence of this firm still sustain due to the growing market and industrial development in China. Secondly, younger subsidiaries, such as #3, #14 and #17 that were 5-7 years old have high level of local purchase and sale, whereas local content of production in earlier entrants #2 and #12 is still less than 50%.

Except in #5, the interviewee emphasized that:

*The import has been increasing in recent years mainly because the elimination of local content policy, and meanwhile more efficient producers emerged in other low-cost Asian markets, which challenge the positions of existing Chinese suppliers.*

Import duties mentioned by four companies have similar function with local content rule. These two instruments are typically restrictive and mandatory rather than voluntary and incentive-based. They seem to be influential on the higher local sourcing in part of S3 and S4, but also emphasized by #11 and #16.

The most influential instrument of local government seems to be assistance programs and development schemes. A critical element of such programs is to improve foreign-local relationships and particular potential knowledge exchanges. This type of government facilitation is mostly cited by cases in Yangtze River Delta. 6 cases in S3, S4 and S5 cited this type of government role. These firms report various types of assistance to local firms or to build platform to bridge the connection with foreign buyers, and potential knowledge exchange. From knowing each other through these programs to the long-term oriented business relationships, knowledge and skills
exchanges have been intensified between the foreign and local firms. This type of government instrument seems to be related to the formation and intensity of local collaboration, for example,

#3 and #4 had found potential local suppliers and customers in international trade exhibitions organization by local government. In case 7, local government has staged an information platform for local and foreign firms in order to create more coordination opportunities. #6 and #10 identified that local government launched private sector programs that promote their connections with local institutions and firms. The manager mentioned that three current suppliers were chosen under this scheme, and two of them are fully Chinese-owned. And these suppliers developed by the foreign firm are given process skills, technical support and training. #3, #4, #5, #6, #14 and #15 who report various types of collaboration with local government’s assistances also are much more inclined to report that governments have played a role in facilitating linkages with local firms.

On the contrary, the negative sign in regression highlights those FDI financial incentives alone are not able to motivate foreign firms to high local orientation or local collaboration. Pearl River Delta in this research is distinguished with the most openness policy, whilst FIPs in this region have lowest degree of local sourcing, for example:

Favourable tax and FDI policies are amongst the most attractive factors in SEZs and other coastal cities in Pearl River Delta. But #2 and #16 located in this region have no local collaboration, and remain high import and export-orientation toward sourcing and sale.

Regressions ascertain a significant role of government involvement in fostering local sourcing and local collaboration. The impact of such government role occurs in a small number of cases, especially in Bohai Rim, such government programs regarding spillover effect and relationship with foreign firms were only recently established, and therefore the direct impact of this role could not as yet be substantial.
Industry agglomeration
Among the location-specific factors, the quality of industry cluster has positive and significant impact in all three aspects of inter-firm linkages. There is a pronounced effect of industry concentration on the local procurement. Such evidence can found in most cases located in Yangtze Delta and petrochemical industry parks or cluster district. Geographic proximity and density fostered intensive knowledge and skill exchanges. For instance,

#5, #7 and #10 located in large petrochemical parks in Yangtze River Delta with concentration of 20-40 petrochemical firms. #6 in Bohai Rim introduced that proximately 50 firms from large SOEs to township small chemical enterprises located in the same province. They have very frequent contact either in formal or informal ways with other upstream and downstream firms. They also reported various collaborations with customer and suppliers located in the same industry park.

Local technological capability
Huge variations in the capabilities of local firms are found within China which affects their likelihood to work with foreign firms, and potential benefits generated through local linkages. Local technological capability of the host region is critical to the explanation of the quality outcomes in local linkages, which are the degree of resource transfer and local collaboration intensity.

The limited capabilities of local partners are impressed by several respondents. When interviewees of these firms were asked to explain why they did not source more material inputs locally, 5 out of 17 cases referred to the unavailability of key inputs or quality weakness of local suppliers. Therefore, unavailability of quality suppliers was the major reason for not sourcing locally cited by these subsidiaries. For instance,

Local embedded subsidiaries, #3, #4, #6, #13 and #14 valued the price and quality of supplies from local firms. #16 claimed that at least one of their three main inputs, ranked by value, could not be obtained locally. #6, #7 and #15 said that they provide any of these resources when the key local
customers request advices or assistance in their further production and management. On the contrary, #3, #5 and #13 reported that, they mainly provide after-sale services to local customers regarding to the product issues, because most of their key buyers do not intend to gain further assistance.

This factor is particularly important as far as the local collaborative linkages are concerned. Collaborative agreements with local organization are most likely and intensive in Yangtze River Delta. Only 1 out of 6 firms in this region identified no collaboration with local firms, whereas 2 out of 7 cases in Bohai Rim and 2 out 4 in Pearl River Delta have no local collaboration. Moreover, formal collaborative agreement particularly R&D-related projects are more often mentioned in Yangtze Delta and Pearl River Delta. The major cities in Yangtze Delta and Pearl River Delta have the most top universities and major government research institutions. The role of these local organizations is particularly important for the formation of collaboration linkages which have replaced internal linkages and collaboration with foreign companies. Companies having formal R&D cooperation with local firms such as in #5, #7, and #10, indicated that a common strategic factor for local collaboration is technology and expertise availability in local firms, as well as market and industrial support factors. It is noticeable that the locational strategic resource can affect foreign subsidiaries' local collaboration. It can be seen that

#5, #7 and #10 considered that, their regional location, Yangtze Delta and Pearl River Delta had good strategic industrial resources such as research conditions which may foster enthusiastic about creating long-term collaboration with local firms. Whereas counterparts in Bohai Rim, i.e. cases #3 and #14 have no such projects but establish collaborative linkages with local government or associations.

Location-specific factors could explain the resource motives contributing to foreign subsidiaries' willingness to share advanced knowledge with local firms and facilitate the development of them. Derived from the interview results, the effect of local linkages as
an element of accelerating local development is expected higher in Yangtze Delta than in other two locations, as the technology and skill transfer to local suppliers and clients tends to be stronger in Yangtze Delta. Foreign firms in Yangtze Delta showed more types of resources diffusing to local firms. Besides essential production specification and process standard, 'hardware' equipments and 'software' technical assistance are mentioned more frequently by cases in Yangtze Delta. For example,

7 and 10 in Yangtze River Delta reported all three types of resource transfer to local suppliers due to intensive and various functions of these backward relationships within China. Whereas, its counterparts 3, 6 and 14 in Bohai Rim transferred 'knowledge' or 'software' to local suppliers.

Foreign firms usually aiming at local firms' material resources or relating to economies of scale are more likely to pass on the benefits to local firms in the multiple types of knowledge such as processing technique, operation management, technical staff training, and assistance with acquiring special inputs. For example,

in 5, the foreign affiliate transferred critical resources associated with product component, equipment upgrade, process technology at different stages, in order to coordinate with product development and efficiency of affiliate itself, or helped the Chinese equity-based supplier to maintain facility and staff training 'bases on friendship established during 15 years cooperation'. Foreign part's contribution of synthetic technique was the main part at the agreement of the joint venture. We are still willing to share advanced knowledge as the company has become deeply interplayed with local firms. Their competitiveness is positively affected our strategy and performance.

Cost factor in local networks
One location-specific factor is particularly pertinent to local orientation of sourcing: low costs in the companies' local networks. Low cost is the crucial advantage in Bohai Rim, comparing with the other two regions. Cases in Pearl River Delta also having import oriented sourcing imply rationalized sourcing and marketing process through
subsidiaries dispersed worldwide. Hence they also concern the insurance of low cost in production. However, in #8, #9 and #12, respondents though that the labour and raw material price keep increasing in recent years, and other low-cost but competitive markets have challenged the Chinese suppliers. This is one of the main reasons for their reduced in local content. Regression models do not generate strong evidence suggesting the cost advantage would impact on local linkages intensity.

In all, above location-specific factors somehow contribute to the regional differences in China’s petrochemical industry. However it is not sufficient to identify the independent role of each factor because more than one factor may be considered as equally important to a foreign firm.

5.3.3 Impact of local orientation on local collaboration and resource transfer

The second emphasis in this research is to highlight the relationships between foreign firm’s local orientation and the outcomes in terms of local collaboration and resource transfer observed in China’s petrochemical industry. This section introduces three applied tools to analyze data of survey and case study to cross examine the impact of local orientation on the quality outcome of local linkages, namely, local collaboration intensity and resource transfer degree.

Mapping for the 17 cases

There seems to be a tendency of the interaction between strategic orientation of foreign subsidiary and strategic outcomes by mapping (Table 5.13) the resource transfer contents and local collaboration based on the arbitrary taxonomy (Table 5.3).
Table 5.13 Association between strategic orientation (S1-S5) and strategic outcomes (local collaboration and resource transfer)

<table>
<thead>
<tr>
<th>Strategic orientation</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of local</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>collaborations</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Number of supplier</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>recipients</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Content of backward</td>
<td>■</td>
<td>×</td>
<td>○</td>
<td>■</td>
<td>○</td>
</tr>
<tr>
<td>resource transfer</td>
<td>○</td>
<td>×</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Number of customer</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>recipients</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Content of forward</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>resource transfer</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>Content of horizontal</td>
<td>■</td>
<td>×</td>
<td>×</td>
<td>■</td>
<td>×</td>
</tr>
<tr>
<td>resource transfer</td>
<td>■</td>
<td>×</td>
<td>✓</td>
<td>■</td>
<td>✓</td>
</tr>
</tbody>
</table>

Annotations: 1. the number of resource recipients out of the 5 local suppliers
2. the number of resource recipients out of the 5 local customers

Legend of symbols: × None  $ Financial resource  ▲ Hardware  ■ Management and production knowledge transfer
○ Software (expertise/engineer)
It can be seen from above table, foreign affiliates having local-oriented procurement are more likely to transfer knowledge and skills to local suppliers. All cases in S3 (local-embeddedness subsidiary) and S4 (local sourcing and global access) have reported backward resource transfer, while several cases in the other four types reported absence of backward resource transfer. Companies having no backward transfer (i.e. #1, #2, #9 and #17) are inclined to rely on the technology of parent firm and their most important suppliers usually located in the home country, consequently they have less pressure to transfer resources to local suppliers. In another word, when FDI operations transfer manufacture and most sourcing activities to China, the large amount of local purchases accelerates their involvement in technology transfer, because foreign subsidiaries having production localization feel more need to rely on local firms’ products.

The difference of backward transfer between high and low local sale orientation are blurring. For example, #9 in S1 and #17 in S5 reported none backward transfer although they are local-market oriented, whereas a variety of transfers take place often in S4, in order to upgrade local input to meet international market standard. The number of local recipient in foreign subsidiaries’ transfer does not significantly change between different types of strategic orientation. Forward transfer involving seems to be distributed uniformly in the six types of strategic orientations. The local-market orientation of sale is not clearly related to forward transfer, since almost every case have various and frequent transfer by explicit documentary knowledge and technical staff movement.

Regarding to the local collaboration existence and intensity, foreign subsidiaries’ strategic orientation would exert impact under two different conditions. On one hand, local-oriented sourcing strategy is correspondent to more intensive local collaboration particularly technology-related activities. Comparatively other cases with home or global-orientated sourcing strategy tend to have none or less collaborative relationships. These cases involving a great amount of intra-firm supply-buy activities do not need a high level of technical collaboration at the subsidiary level; they rather tend to rely on their headquarters for R&D support. Unlike subsidiaries having home or global orientation strategies, local embedded subsidiaries require on-site technological
capabilities, local adaptations to support their manufacturing requirements which facilitate establishment of local collaboration. On the other hand, cases of local market access do not necessarily create collaborations, for instance, local sourcing & export-oriented (S4) cases #5, #7 and #10 have established long-term collaborations whereas import-oriented & local market access (S1 and S5) cases #1, #9 and #11 identified none collaboration in China. This evidence reinforced the significant role of local sourcing rather than local sale in enhancing foreign subsidiaries' local embeddedness in China.

The existence of MNE subsidiaries' sourcing, sale, collaboration and resource transfer in China was firstly proved by means of interviews, and relative data successively gathered in the mail survey. Typology of MNE subsidiaries' strategic orientation was drawn on information gathered from interviews. Of the five categories of strategic orientation, one has local-oriented sourcing, and one has local-oriented sourcing with sale. 11 out of 17 companies purchase more than 50% input from local Chinese suppliers; and 8 out of these 11 companies reported over 50% of both purchase and sale with local Chinese firms. This finding is broadly consistent with the evidence in mail survey sample, where the mean value of the 63 foreign firms' local sourcing and sale are both over 50%. Extent of local sourcing is found to be significantly related to local market-orientation. This corresponds to the previous literature argued that local market orientation was related to the local content of foreign subsidiary's production.

**Scatter plots for the 63 firms**

Further explanations can be provided if assessing the positions of the 63 firms in the diagrams (see scatter plots in Appendix 7) and integrating the analysis with the practice of interviewed cases. Four different scenarios (Figure 5.14) are divided by the mean ratio of local sourcing (56%) and local sale (62%). This grid can be used to suggest the occurrences of local orientation with the variance of the degree of backward resource transfer and local collaboration intensity. It needs to be clarified that the four scenarios are not classified by the same standard as used in strategic orientation typology created in the case analysis. The five types of strategic orientation were useful to analyse MNEs' global value chain strategies and their role in international trade of Chinese
petrochemical industry. Nevertheless the arbitrary classification is not decisive to predicate potential technology transfer and spillover to local economy and Chinese firms. There is no clear demarcation between high and low level of sourcing and sale quantity. Given the assumed scale of local orientation ranging from 0 to 100%, 50% is used in the case study to decide local dominance, whereas in the actual surveyed sample, only a few of them have local sourcing or marketing of less than 40%. It can be postulated that a more appropriate demarcation should sit at higher scale than 50%.

**Figure 5.14 Matrix of local orientation and linkages quality**

<table>
<thead>
<tr>
<th>Situation IV</th>
<th>Situation III</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>High/medium backward transfer</td>
</tr>
<tr>
<td></td>
<td>High/medium backward transfer</td>
</tr>
<tr>
<td>Medium collaboration intensity</td>
<td>High collaboration intensity</td>
</tr>
<tr>
<td>Varied forward transfer</td>
<td>Varied forward transfer</td>
</tr>
<tr>
<td>Situation I</td>
<td>Situation II</td>
</tr>
<tr>
<td>Low/medium backward transfer</td>
<td>Low/medium backward transfer</td>
</tr>
<tr>
<td>Low collaboration intensity</td>
<td>Low collaboration intensity</td>
</tr>
<tr>
<td>Varied forward transfer</td>
<td>Varied forward transfer</td>
</tr>
</tbody>
</table>

When foreign firms have a combination of below-average sourcing and sale in China (Situation I), their home-country-based purchase and sale are prominent, and so are the intra-firm or international linkages. Of the selected sample in mail survey, fewer companies present in Situation II. There are no such companies in interviewed cases. Although local sourcing is over 50%, but below average is also reflective of the practices that relied heavily on imported or intra-firm purchase. It is also characterized by slightly more backward resource transfer and local collaborations. Situation III is distinguished by the highest local orientation of value chain activities in China. The regression estimations suggest the significant role of local sourcing and moderate role of local sourcing on the quality outcomes in local linkages. This scenario reflects the
business practice of maximizing the use of local resources and market offered by Chinese companies. Companies in this situation reported large variance in the degree of backward transfer, including a few firms that report low level of backward transfer. Interview results suggest that these cases reporting little backward transfer use local purchases to reduce costs and source their inputs in less developed location, Bohai Rim; and their local input manufacturers are less dynamic. Cell IV, describes the situation in which there is higher local sourcing but below average scores on local sale. According to regression results, this type of strategic orientation is usually characterized by high backward resource transfer and moderate tentative to form local collaboration.

**Regression test**

It is difficult to conclusively judge by just comparison of a small amount of cases. With more robust estimations, OLR results (Appendix 6) are able to bridge the connection between the qualitative and quantitative linkages characteristics, whereas not all the expectations are deemed extraordinary. Summarized estimations in table 5.15 below show that local orientation of sourcing and sale has positive impacts on the degree of resource transfer and local collaboration intensity.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Local cooperation</th>
<th>Backward transfer</th>
<th>Forward transfer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local purchase</td>
<td>.000 (16.622)</td>
<td>.061 (6.078)</td>
<td>.425 (2.634)</td>
</tr>
<tr>
<td>Local sale</td>
<td>.003 (9.353)</td>
<td>.380 (2.294)</td>
<td>.064 (5.265)</td>
</tr>
</tbody>
</table>

*Note: 1. Value in bracket is ‘Estimate’ in OLR  
2. Significance levels: p< 0.05.*

Results confirm that foreign affiliates’ tendency to form local collaborations is significantly influenced by the volume of supply chain activities in local networks. Among these positive relationships, the degree of backward resource transfer is insignificantly related to the local orientation of sourcing; local sale propensity is found
with no significant contribution to increase of forward resource transfer; the intensity of local collaboration is significantly influenced by local orientation of sourcing and sale simultaneously. These findings suggest that the more foreign firms buy inputs locally the higher the likelihood of supplier linkages characterized by a higher transfer of beneficial resources; subsidiary scores on higher local sourcing and sale present higher likelihood of collaboration and development potential to their local network partners.

5.4 Discussion and Further Explanations of Results

Embedded in the findings of case study, the average number of relationships established by foreign subsidiaries in petrochemical industry seems smaller than many other manufacture industries, for example, electronic, textile and automobile. This difference is mainly determined by the high capital and technology-intensive barrier for entering petrochemical industry and the type of input are less variety. Considering the product nature and transport difficulty, it makes sense for petrochemical MNEs to localize input especially U.S and Western European firms whose major plants are located in Asian countries distant from home market.

Comparing with previous studies that focused on backward linkages, this research suggests that customer relationships are as important channel of knowledge transfer as supplier linkages, and forward linkages may contribute greater impact for petrochemical firms because its sales are more oriented to manufacturing. We can say that petrochemical MNEs in China have been moving toward the strategic direction 'globalization strategy toward globalization, implementation toward localization' in terms of embeddedness of production-supply-marketing. However, they endeavour to reduce knowledge leaking from those places that embed key capabilities, especially research and development centre providing technology support for localized invention and management.

Contrary to general expectation, this research finds out that factors are discrepancy conducive to local orientation, local collaboration and resource transfer; large purchase
and sale are not uniformly associated with high quality linkages. Results suggest that different linkage variables are affected by common antecedents, as well as respective explanations. Some predetermined factors show discrepancies in explaining various linkages variables, namely, firm-related, host market and home market differ by the significance in explaining the three linkages tiers. These findings reinforce the need in studies that attempt to investigate the aggregate effect of MNEs in host countries to disentangle quantity and quality dimensions of local linkages. Figure 5.16 below illustrates any significant causal relationships amongst all that is examined. Rest of this section discuss the captured evidence and deeper explanations.

Figure 5.16 Validated causal relationships in this research

Legend: → significant impact —— insignificant impact
5.4.1 Common antecedents to quantity and quality of local linkages

**Strong effect of country of origin and industry cluster**

Even with the purported impact of country of origin, it is not sufficiently validated in the existing literature. Analyses performed in this research find salient linkages characteristics of foreign firms from different country of origin. Evidence that Japanese or other Asian firms are less inclined to establish local linkages and transfer resources than Western firms is in some extent suggestive of the impact of home environment on corporate culture, subsidiaries’ attitude and the way to conduct inter-firm linkages.

As for Japanese firms, Japan remains the dominant source of input procurements, and there is still a strong tendency to favour relations with other Japanese firms over firms of different nationalities. It is the reason that the reliance of Japanese firms’ procurement on intra-firm transactions as well as keiretsu transactions. Japanese MNEs are among the most integrated firms, where there is little or no decentralization of decision making (Ruigrok and Van Tulder, 1995), subsequently strong long-term relationships with domestic suppliers and distributors hamper the creation of linkages with local suppliers in host countries (Thomas III and Waring, 1999). Another equally important factor is, Japanese firms have strong reliance on wholly-owned investments to expand manufacturing operations in foreign countries (Belderbos, 2001). The decline in the importance of local procurement in Japanese and other Asian firms may be partly due to the increase in new affiliates globally. New affiliates tend to rely on parent companies for the supply of inputs because they have not created procurement networks yet. The great importance of export for indigenous firms in Japan implies that the production output produced by Japan has been substantially utilised by subsidiaries in various countries. This phenomenon appears also in Taiwan-invested firms that followed their business customers to establish affiliates in China or still import from key suppliers in Taiwan. Being owned by an Asia parent in itself may not appear to influence significant change of local linkages comparing with western subsidiaries. But a similar tendency is
identifiable, in a less pronounced manner, with companies originating from since companies from ASEAN are new international investors, they might well be expected to show high levels of reliance on their parent company. At the same time, for geographical and linguistic considerations, South Korea's overseas investment is often by the large number of Korean companies jointly completed.

During the interviews, European firms present a more explicit philosophy of developing local network partners, even to the extent of being willing to sustain higher initial costs. They are more active in encouraging and helping new locally-owned supplier firms to establish in China, thereby contributing more knowledge and stimulation of local enterprises. The American firms do not establish this type of philosophy. Instead, they have adopted a procurement policy to purchase inputs at the lowest cost regardless of their affiliation of the suppliers, in order to achieve efficient production. Local linkage decision being much more directly determined by changing relative costs of sourcing in different locations lead them to centralize purchasing in China, or other Asian countries after years of dominant reliance on imported inputs. The Japanese firm also followed its parent company's practice of subcontracting input production as far as possible, but it was less concerned with developing local suppliers firms, preferring instead to rely on established Japanese suppliers in China. However in terms of long run local linkage, the Japanese firm probably is least effectual, since it relies heavily on established Japanese suppliers who independently set up subsidiaries in China in response to the customer's location decision.

The pattern of local linkages between Japanese and western companies could also be stressed by organizational environment especially the local employment practice. The interviews regarding to the local management level of the company suggest that the local managers generally play a major role in domestic business due to their close relationship with local networks. A large number of expatriate managers in Japan and other Asian-invested firms possibly affect local supplier selections. Japanese companies have the relatively strong personal networks and narrowly meshed company interdependencies could make it challenging to establish external linkages with local firms. But Japanese
companies in this localization are slow. In the Japanese cases, senior manager, executive vice president is all designated by parent firm in Japan. Especially in wholly owned subsidiaries, managers at the middle level the company are all from Japan. In the joint ventures, some of the functions of the department often sent by the Chinese side, which affects the above-mentioned study on Japanese corporate managers of local credibility. The Western MNEs' globalization began much earlier and therefore more open, more tolerant of diversity with the organization, organizational structure and more flat, and make much less use of an integrated and centralized strategy than Japanese MNEs (Yip et. al., 1997). Western subsidiaries' corporate culture enables rapid localization by actively building local sales networks, easily absorbing the local managers and technical staff. The local recruits tend to have local knowledge and contacts that are of considerable assistance in creating supplier relationships (Dobson, 1993). The replacement of expatriates with local managers and technicians was observed in many western companies interviewed including some that were wholly foreign-owned, were promoting the practice of sending potential local managers abroad for training, which opened opportunities to learn from working with foreign managers. When these western participants formed joint ventures with relatively strong local partner enterprise, the original managerial personnel from Chinese partner mostly continued their positions because they are familiar with the local situation. Local involvement becomes more important and prominent in the cases where the local managers are employed.

It is noticeable that country of origin appears with different willingness of foreign parent firm to transfer or share knowledge with local firms. The evidence broadly supportive of that is foreign affiliates of US and European MNEs are more willing to share or exchange advanced technology and knowledge with local firms. Western MNE subsidiaries established the most technology-related collaborations with local organizations. Moreover, the European companies usually received critical technology from parent companies and positively related to the transfer of similar, or related, resources from the affiliate to local firms via transaction relationships. Japanese, Korea and Taiwan MNEs' subsidiaries, in contrast, prefer to closely link with other wholly-owned affiliates and integrate within MNE and internalize distribution and sale functions.
Skills and experience transfer through training seem to take place more often in western firms than in Asian firms. Japanese cases particularly have more restricted standard for selecting local suppliers in term of experience and technique capability thereby reduce the necessity to provide technology assistance. In essence, the European and the US MNEs are richer in strategic and knowledge resources, a situation that is clearly distinct from the resources available in the networks in China and other emerging Asian investors. Second, the western firms, based on ownership advantages in capital or technology intensive sectors, had invested to target the local Chinese market to exploit rents from these advantages. However, Japanese and Asian MNEs have different ownership-specific advantages, e.g. adaptive technology, better market knowledge which allows them to compete in the developing economies. Third, American and European companies have highest value on ‘market-driven’ configuration and indicated the increasing importance of Chinese markets. Since they targeted local markets, they needed to rely more on local partners, and thus they tended to share the ownership with the Chinese partners in the form of the equity joint ventures.

The significant role of industry cluster in all three aspects of inter-firm linkages reflects the importance of local availability in determining the extent of local sourcing. The level of local sourcing is lower in regions with smaller scale of industry concentration, because there are fewer opportunities for foreign subsidiaries to find competitive suppliers than is the case in larger industrial regions, e.g. petrochemical industry park. Localities with industrial zones attract more FDI and Technology Parks have the social development function. So it creates networks including industrial experts, investors, business men, researches, managers and inventors. Confronted with a small supplier base, compensate reduced local procurement with extended intra-affiliate vertical integration in case the investment climate is supportive. Average development of industry concentration exerts a positive effect on forward linkages through its loading on the infrastructure factor. Interviews indicate that some foreign affiliates in China develop local sale over time, as they accumulate experience of local market and customers. As discussed earlier, in addition to essential after-sale services, foreign senders tend to provide assistances by sending staff to closer customers. When applying
to the firms with industry cluster, convenience would facilitate this type of knowledge transfer.

Furthermore, evidence that quantity of local linkage is highest in industry cluster is due to a direct effect of SOEs’ control over scarce resources, and an indirect effect of SOEs influencing local informal institutions. The clustering of domestic firms could be seen as positively related to local linkage quantity is the result of over-riding importance of availability. Foreign investors are more likely to locate where institutions facilitate access to scarce resources. Local authorities not only provide land to industrial zones and but also make commitment to creating a favourable investment climate, such as tax incentives and institutional facilitations. Foreign subsidiaries in such locations would set up intensive local linkages in order to reduce investment costs and source raw materials, utilities and engineering services from local petrochemical enterprises. The interviews also provided evidence for foreign subsidiaries that were inclined to select SOEs as their local partners when they pursued higher local sourcing strategy as partnering with a local firm enhances the legitimacy of foreign investors with local constituents. On the other hand, lobbying and the economic bargaining power of SOEs at the provincial level may have a significant deterrent effect on foreign investors. The SOEs may perceive foreign entrants as a threat to their market share or they protect their interests in different ways. Incumbent SOEs appear to influence the institutional framework so as to encourage foreign investors to partner with them, yet they do not have a significant effect on quality of local linkages.

The concept of linkages is basically concerned with activity-based connections, whose importance depends on the nature of the technology involved in the competition. The location of industry zones is usually filled with high competition from both SOEs and foreign firms after the economic reform. Due to the intensive competition from both foreign and Chinese firms, foreign subsidiaries in these localities have higher requirement on their input supplies and technology which may not be available in local market, and subsequently are pressured to bring in more advanced firm-specific
capabilities. Information is also more abundant in these areas which promote local and overseas marketing channel.

In addition to the vertical relationships, the important role of Technology and Industry Parks is the creation of collaboration between actors of different but closely related industries. Foreign firms operating in a cluster competitive location more actively engage in local collaboration in order to develop products and technology that can be absorbed by the Chinese partners. Local collaborations are particularly important in industry cluster locations since technology is the key to competition. Foreign companies operating in this type of network have a strong preference for local linkage, because activity-based local connections facilitate innovation. Through these relationships, foreign firms improve their competitiveness by reducing production costs, providing multiple sources of supply, increasing proximity to the market, and enlarging market share. They may also take advantage of local technological capabilities by hiring local scientists and engineers and engaging in joint R&D projects to improve technological competence (Estades and Ramani, 1998).

**Moderate impact of government**

Undoubtedly, host governments could facilitate the investment of MNE or the creation of local activities through ‘soft’ or ‘compulsory’ instruments, such as favourable trade policies, local content regulation and government’s development programs. From the experiences of those cases reported local relationships emerged from these programs, it can anticipates that the impact of assistance-based government role will promote MNEs' local relationships and ensure these linkages lead to development potential.

Preferential FDI incentives and compulsory regulations by the Chinese government only affect local sourcing at very limited scores, as these instruments alone are not sufficient for local industries to be integrated to foreign firms’ international value chain. Companies are mostly fostered to use local suppliers in China if they want to qualify for the preferential tariff treatment and tax break which are also applied to products exported from China to overseas markets. Although specific incentive instruments were
highlighted as being substantially beneficial for local sourcing, they only show very limited resource transfer. Meanwhile, this factor do not contribute to the formation of local collaboration, as currently the local government has not pronounced any incentives to encourage foreign investors to enter collaborative agreements with local organizations.

SEZs in China have very succeeded in attracting FDI by the most openness policy, which are poor though to encourage local linkages. It implies that the regions in a country that is more open to international trade can be explained along these lines: the more open to trade or competitive a local market is, the larger are the potential costs of production, rather than the most cost-competitive suppliers. Large scale of foreign investments may translate into lower local sourcing due to their good capability that attracts more inter-firm transactions. To the contrary, the non-coastal areas have been late in opening up and having difficulties in attracting a large volume of foreign investments, due to much less developed infrastructures, long distance away from international markets, lack of skilled labour, much weaker market arrangements and law enforcement, etc. These weaknesses may result in a more closed supply network which reduces foreign firms’ need to import. Furthermore, FDI attraction instruments by the Chinese government have discriminated by nationality of investor meaning that greater incentives are offered to attract FDI from Hong Kong and Taiwan. The government at national and regional levels in China offers special incentives to investors from these countries. However, these investors show the lowest technology transfer in local relationships. FDI incentives should also be related to the fact that a majority of foreign firms in China are located in coastal areas as mentioned earlier. Moreover, as discussed in the beginning, the level of foreign firms’ technology transfer to local firms is more likely to depend on industrial development rather the internationalization of a location.

Although Chinese government has since WTO entrance eliminated most of the typically restrictive instruments in the petrochemical industry, they could to some extent shape today’s linkage pattern. Under control of the effect of regional and time factor in local content rules, it appears not to matter whether individual affiliates indicated that they are confronted with such rules, compulsory regulations appear to have played only an
indirect role when it comes to technology transfers to local firms. Even though tariff and nontariff regulations initially forced foreign firms to establish local production in China, and partly also affected the decision to source and sale locally, the main motive to provide local firms with technological assistance and knowledge is the company's need to source quality input and serve in various host markets in the most economical and efficient manner.

5.4.2 Different antecedents to quantity and quality of local linkages

Effect of subsidiary-specific factors on linkage quantity

Even though theories purported the effect of firm-specific factors in internationalisation, it is not necessarily they would lead to the changes in local linkages. This research finds the effect of subsidiary's ownership mode and age only on the quantity of local linkages. Those factors conducive to linkage quantity are devoted to MNEs' initial entry and successive sourcing decisions, but found to be less useful in explaining the development potential of local linkages, which are inclined to be more dynamic and emergent actions.

Various theoretical approaches clearly identify 'time' as a key to the understanding of respective positions of MNEs and their local partners in the inter-firm network relationships. The result partially conforms to what is anticipated in the theories. Increase and decline of local content are both found in the early entrant, encouraged by MNEs' revolution of global business environment and strategic moves. This supports the view that, the subsidiary has not necessarily operated for a longer period of time in order to retain a strong orientation toward local input. The length of presence in China is very likely to accumulate customer base and boost local adaption of products. The effect of time on resource transfer implies capability development of local firms over time results in foreign firms' interest to maintain or upgrade relationships with them. The cases see the importance of time as to local firms would benefit from strong links with foreign affiliates of long-term duration, rather than merely from the length of time spent.
in the host country. It is therefore conclude that the foreign firms’ learning curve and adjustment to the local environment is less important than the evolution of a specific supplier relationship. In reality, the effect of experience on resource transfer could be negated when accumulated experience helps foreigners to learn that local suppliers do not have capability to make knowledge transfer worthwhile. Inter-firm collaboration is a matter of trust and common interest which are growing over time. The knowledge accumulated by the foreign subsidiary in the host country plays a role in the strategy it follows. Especially, the internationalisation of R&D usually follows the establishment process of production or commercial activities which requires time. Being more acquainted with the local context, MNE subsidiaries gradually become more dependent on local networks while improve ability to scan for local partners in order to embark particularly on technological collaboration. Successively, it is likely that older subsidiaries with a higher propensity towards local collaboration are more rooted and create higher development potential in the host country.

The results confirm the significant role of partially ownership of foreign subsidiary in fostering their local sourcing. But no significant effect is found on local collaborations and consequent resource transfer via these linkages. Petrochemical firms often consider suppliers as close business partners, with specific systems to deal with such partners, especially in joint ventures. The fact is that supplier relationships with local JV partners who are the critical source of main input of foreign subsidiaries and fulfil direct resource functions, are more committed and interdependent. These relationships lead to more exclusive supply to foreign subsidiaries on certain product, and the purchases with them are also mentioned to be stronger than import. This is particularly true when a JV manufactures products similar to their local partners’, because strong local partners usually have extensive networks of production linkages and relatively good technology in relevant industries. Their pre-existing personal relationships can also be used by the JVs. In a contrast to the capital commitment JVs had in local supply chain, foreign investors entering through wholly owned subsidiaries are less reliant on local supplies. The fact is that WOSs face higher costs of finding and establishing a local network of suppliers. Predominate role of equity-based firms in JVs’ local relationships also help
foreign firms to benefit from knowledge and resources of local partners in order to reduce uncertainty cost thus to be more capable to diversify and develop their local networks. Based on this ‘cost’ consideration, MNE’s choice of entry mode is usually associated with the investment plan in local relationships prior to undertaking FDI. Those investors that intend to spend more resources on building local relationships are more likely to choose a JV over a WOS.

Widening out the discussion to include relative factors, MNEs keeping subsidiaries under close scrutiny and controlling on their local operations may also explain why the overall level of localized sourcing in WOSs are lower than in JVs. The case analyses show that the WOSs’ decision makings are more dependent on parent firm or headquarter than JVs. WO cases are under tight control of parent firm on its external business relationships, and are hence less likely to have to rely on internally imposed suppliers. This means they have more scope to work closely on outsourcing decisions with local suppliers, or even other local firms in the complete value chain coverage from upstream input through basic chemical production to distribution. Consequently the influence of parent firm on the management would result in high reliance of its subsidiaries on local firms and changeability of operation convention. On the contrary, JVs usually rely more on local suppliers, they are more independent in their decisions, concerning the orientation and selection toward local suppliers. Thus, they can be integrated more fully into the local economy and spillover effects originating from their cooperation with local suppliers may be more substantial. On the contrary, WOS establishments appear to have a negative effect on local firms in upstream sectors. Moreover, forward linkages with both fully and partially owned affiliates have a positive impact on the productivity of local Chinese firms.

However, the results did not confirm the significant effect of ownership mode on the transmission of knowledge and technologies to indigenous firms. Established linkages with JVs offer higher opportunities for technology transfer, although it is not significant. Role of the equity-based suppliers is a key factor in the explanation of the degree of technology transfer. It is positively related to the degree of technology transfer, showing
that equity-based suppliers benefit from more knowledge transfer than non-equity based ones. Companies who have higher share of equity-based relationships reported higher transfer in such relationships. Notwithstanding WOSs are replacing equity-based linkages with external independent suppliers, this does not necessarily imply fewer local relationships and less technology transfer. As long as local firms have foreseeable capability, foreign subsidiaries typically will tap into resources and skills of these local firms by various non-equity modes. It can be argued that fully controlled subsidiaries provide a more flexible and efficient platform for knowledge sharing and information exchange than do JVs. Because the management complex and technology gap in many joint ventures or co-operation projects, technology transfer may have lower efficiency in these enterprises than wholly owned subsidiaries. A complementary finding is that knowledge transfer potential is highest in a situation where the subsidiary also benefits from the technological knowledge base of the MNE i.e. is internally embedded with the MNE network. This finding goes hand in hand with our results on the importance of the MNE network for product development for subsidiaries with high knowledge transfer potential.

Joint ventures affiliates do not ensure to create higher development potential for local economy than wholly-owned ones, because the quality of transfer is determined by the core technology value of input and output. It is noteworthy that although joint ventures appears more willing to transfer resources to local firms, without enough technology related information, the quality and advancement level of these resources are not strongly supported in this research. Only two company interviews mentioned that, on average, the technologies transferred from MNEs to the subsidiaries established through joint ventures tend to be older than the technologies transferred to fully-owned subsidiaries. MNEs also pay more attention to establish R&D capability in their fully-controlled subsidiaries. So if fully-owned affiliates posses more valuable technology and knowhow than partially-owned ones, they will have a greater influence on the linkage effect at least local customer firms will learn more from the technology content. Fully-owned subsidiaries are usually considered producing more specialized and technologically advanced chemicals as they have larger export to international markets.
in this research. Hence, these subsidiaries are more likely to diffuse technology or skills to local producers. While it also can be argued that although JVs are effective at transferring technology and knowledge to local firms due to the face-to-face interaction and shared fate of the JV partners, local linkages to non-equity partners may entail equally substantial process, product and even functional upgrading if the mutual dependence is high.

**Effect of local sophistication on linkage quality**

Results note that lowered cost in host country have little consequence for quality of local linkages. Although petrochemical manufacture needs intensive capital and technology, about one third of interviews consider cost factor as 'important' and 'very important' motives in their investment. Some of firms are seen with embarking only on highly local sourcing of low cost input, whereas others have firms have high levels of trade with other foreign firms or other MNE subsidiaries. The large import of input is mostly because of unavailable locally. With regard to the impact on resource transfer, foreign buyers prefer to purchase from local suppliers who meet the standards of production, and hence there is no need to invest substantial resources in upgrading them.

Instead, local linkages tend to increase with the availability of strategic resources, i.e. technological capability, expertises or skilled labour in the local network partners. The technological capability factor is also industry-specific and location-specific, which is a reflection of the industry development and the technology competition between the market players in the host country.

It has claimed in substantial studies that strategic resource seeking firms more relying on local market and collaborating with local organizations than their counterparts of resource-seeking and efficiency-seeking, and they are more enthusiastic than counterparts with regard to transferring knowledge resources. The information obtained from interviews helps understand this process further. The respondents mentioned the importance of low cost and price when choose local suppliers. However, foreign firms would be more likely to provide 'hardware' and 'documentation and specification'
knowledge resource when these resources are adequate in local suppliers which means they are more capable to efficiently absorb, apply and learn these technology. The tendency to form local collaboration also appear to a large degree be related to the capacity of the local partners and the research environment. In this respect, evidence from the survey can indicate that technical assistance to university and company collaborators is more widespread where they have relatively more capabilities. Strategic resources are motivating and exerting pressure on foreign firms to transfer technology or assistance to their local firms, whereas those strategic resources are more likely to sacrifice control in exchange for inter-firm coalitions. Easier access to local knowledge or expertise resource would reduce reliance of foreign firms on MNE parent firms, and hence foreign firms become highly embedded with local business environment. Strategic and knowledge resources are considered to be distinctive and advanced, as compared with basic resources. Accordingly, observed greater networking activities of foreign firms in the Yangtze Delta reflect the importance of local linkages in accessing and mobilising strategic and knowledge resources, both of which are embedded in the networks and difficult to obtain from the open market. Association with local firms or institutions is essential if these kinds of resources are to be secured: therefore the more these kinds of resources are sought in the host country, the more local linkages are needed. This can be interpreted as the foreign firms seeking higher degree of knowledge resources in host location are more likely to exchange their own knowledge with local firms.

Foreign firm having high local content in their production may establish strong supplier linkages in China, but not all of local suppliers had succeeded in supplying high-tech products to the foreign subsidiaries. Firms having procurement of specialised input from local suppliers, which always trigger more often technology transfer as necessary resource provided to these suppliers. The higher level of specialization lead to a closer interaction and a higher level of technology transfer from foreign firms in order to enable their suppliers to produce customized chemical, and enable local customers to receive more dedicated assistance and advice. The frequency of technical assistance and advice do not change according to either of firm-specific variables. However, the main
impression though is similar with supplier linkages, that foreign affiliates are more willing to transfer their know-how and technology if product supplied is specific to the production process of local customer, and if output of foreign firms is specific to local firms' could potentially receive. This suggests that Chinese petrochemical enterprises would benefit from access to specialised products and services from FDI projects which are often adapted to local conditions that otherwise would not be available. This explains partly with the fact that when inputs required by the foreign firms are relatively simple and standardized, they are less likely to transfer advanced knowledge to local suppliers.

Technology and expertise are also critical to foster foreign firms' resource transfer to local customers. Foreign subsidiaries supplying customers with specialized products and services also provide more technical assistance or advice with respect to new applications, designs, or engineer training. Nevertheless, requested transfers are limited by local buyers' capability to conduct R&D. Other factors are found to intervene in the variation of MNE subsidiaries' linkages with local firms. The degree of resource transfer from foreign firm is influenced by the general techniques of production. The product itself is helpful in showing how important the technology content is in the product and to explain the degree of transfer and the quality of these transfers. Foreign firms' local purchase varies in product nature which results in different relationship characteristics. Specialized products and services are either developed by the foreign parent, or jointly developed by the parent and the subsidiaries, which are embedded with highly advanced technology. Companies facing specific problems or requirements related to having a particular supplier imposed, forces the subsidiary to find specific ways to help the suppliers to improve their technology support. Companies produce highly specialised and technology-intensive products that are dedicated to overseas markets. The MNE allocate input localization tasks to their suppliers in different countries, and each market context requires modifications and adaptation of product design. Therefore the subsidiary in China has less flexibility in their local sourcing and has better willingness to provide explicit technology-based resources, such as licensing of patent technology, equipment and technical expertises' assistance to assure initial quality supply.
The number of suppliers in manufacturing the same product may be another important factor to explain backward resource transfer when looking at the disability of the main factors discussed in this research. Some firms uncover their preference for a single supplier of each product that drives technology transfer to their local suppliers. Firms favour a single supplier for one item purchased are also more likely to transfer knowledge than others with several suppliers per input or output. This could also lead to a change in the relation with the suppliers from one based on adversarial arm’s length transactions with multiple suppliers to one based on closer partnerships with a reduced number of key suppliers (Phelps, 1997). Regarding to non-equity relationships, western firms tend to keep a single firm for supplying one product once the relationship is established. Comparatively most Japanese and Asian subsidiaries prefer to have more than one supplier for any particular item purchased.

5.4.3 Relationship between quantity and quality of local linkages

It was supposed that companies characteristically interwoven at a local level would produce a significant effect on the quality specification of local linkages, namely, intensity of resource transfer and local collaboration. Evidence summarized above is somewhat contrary to what was anticipated at the beginning of the research. Local sourcing and sale are detected strongly influential on local collaboration only.

Intensity of business transaction is an important reflection of embeddedness. Low embeddedness in local business could result in few or even none collaborative relationships between foreign and local firms. Due to the higher level of local sale, the host country market is important to those foreign firms who are more likely to seek collaboration especially with local distributors and customers. These collaborations could induce foreign subsidiaries to learn, to change and to adapt their production and process to meet local demand, meanwhile could reduce cost and improve efficiency of downstream business. Dependence on local supply also needs to be substantial in order to drive foreign firms to upgrade their local suppliers. Such embeddedness allows for sizable cost savings thus providing a competitive cost advantage to those foreign firms
built from locally based materials and services. Additionally, slowly increase in collaborative linkages over time implies that MNEs’ external collaborations maintain at corporate level when its subsidiary initially established in host country, the subsidiary will be more tentative to collaborate with local firms given accumulated knowledge about local business context and develop own capability.

Evidence in this research tells us that share of local content is not the best variable to highlight backward resource transfer. Some firms pursue the most of their input from local firms and generate limited technology transfer comparing with their counterparts who have larger import and higher degree of resource transfer to local firms. High score of local purchase and sale in developing economies means that those firms may concern cost saving rather than knowledge intensive production that result in less transfer to local suppliers. Comparatively, companies who purchase smaller quantity but more specialized and technology-competitive products also provide more knowledge and skills to local suppliers. Moreover, highly production and sourcing embeddedness in local business context fosters various collaborations between foreign subsidiaries with local firms, institutions and government. Foreign firms with higher export-orientation are not inevitably to transfer less knowledge to local firms. Contrarily, quality requirement and international market standards on local suppliers’ production can explain the increase of local backward transfer. Some firms in this combination choose to establish subsidiary in China as regional centre procuring from peripheral Asian markets and supplying overseas markets. In this cell, foreign firms’ value chain relationships are normally pursued to develop rather to only access to low cost. It can be concluded that the four scenarios are dynamic and the relationships between MNE subsidiary’s local orientation and outcomes in local linkages are intervened by other factors discussed earlier.

Though with an insignificant sign, local content of foreign affiliates is still an important explanatory factor to the quality outcome of local linkages. Because firms with higher local content may need to effectively interact with local suppliers, they are more likely to devote effort to local transfer. It can be argued that foreign affiliate may be driven to
invest more in local relationships in order to capitalize on the China’s comparative advantage, particularly if they are more reliant on local materials. Higher independence on local suppliers is also in relation to less motivation for foreign subsidiaries to transfer knowledge and technology to local suppliers. This is partly because it may be difficult for foreign firms to identify effective suppliers and there are fewer competitive pressures to do so. As a matter of fact, the oil price and production cost is rising in China these years, and there is always good options of importing from some other Asian countries.

Result is also contrast with many other studies that contend that local-market oriented firms generate more resource transfer to local suppliers, even though local sourcing may be not substantial. As a matter of fact, in the Chinese petrochemical industry, many foreign subsidiaries with higher resource transfer tend to be export-oriented and localized in terms of their sourcing of materials and capital goods. Foreign subsidiaries having larger export are more likely to purchase capital or specialized input from local suppliers that hence will be received more technology and skills transfer. One critical though to the analysis of transfer as in the context of a developing country, production for international market requires more operate efficiency, technological dynamism and market volatility. In contrary, foreign firms that highly focus on the local market may pay less attention to quality and their products are less technology-intensive. Therefore, stronger local market-oriented firms have less pressure to upgrade their local suppliers.

Local forward transfer occurs often in need of local customers and variance between cases is small. On one hand, local market-orientation has a positive impact on the transfer to local customers. It is apparent that more local customers the foreign firms have, the more substantial of transfer will be accumulated. As competition intensifies in petrochemical market in China and as the complexity and sophistication of the distribution and sale of the product increases, foreign firms’ provision of technology and skills to downstream firms increases. However, on the other hand, the conventional significance is low. Foreign buyers are willing to maintain close relationships with direct customers and provide instant assistance or advices once stable supplier-customer relationships have been established.
CHAPTER SIX CONCLUSION

There exist a few points distinguishing this research from others in the literature, such as defining theoretical concepts and methodology. Findings in this research add to exiting literature of understanding MNEs activities and their impact on host countries, particularly in developing countries, and more specifically in the fast changing China. The desire to capture the mechanism and channel of FDI impact has been a long-standing objective of host government. This research also provides important implications for the academic literature, MNEs, local firms and host government. However, there are limitations in this research which could derive recommendations for future research.

6.1 Summary of the Research Process

First of all, this research develops the conceptual scope and research context of inter-firm linkages and local linkages. It has addressed that local linkage as a multi-facet process of interaction between foreign subsidiary and local firms, involving different degrees of transaction and knowledge transfer, which should be considered as complementary dimensions of MNE’s impact on host economy. This research process also involves various types and dimensions of local linkages, including backward linkages with suppliers, forward linkages with customers and horizontal cooperation with local partners. Especially, notion of forward linkages is important in the area of both international business and host government policy, but scarce in previous studies. This is the first cross-region within country boundary analysis of local linkages, and the results presented in this thesis are a useful basis for the development of government policies and strategies towards foreign-local firm linkages.

Secondly, while Chapter 2 has attempted to combine insights from two rather distinct streams of theory on linkages, it was argued that they need to be integrated to a much higher degree than what is currently the case. This research is based on more than one
theoretical streams, which brings in difficulties since it does not test on approach but a construct of factors selected from the analysis of theories linked to the determinants and impact of foreign-local inter-firm linkages. Findings regarding to the influential factors on foreign firms’ inter-firm linkages help bridge the two theoretical perspectives, which can prove that the social and developmental benefits through local linkages will also depend on the determinants for engaging in such linkages. In particular, as long as the development implications of linkage formation concerned, it need to obtain a better understanding of what drives firms to engage in linkages. The findings provide the impression that two bodies of literature to a large extent share the same theoretical categories and assumptions. From a business strategic point of view, a better integration of the international business and developmental literatures may be helpful to MNEs operating in the developing countries. Interview results to certain extent suggest that some firms adopt developmental objectives such as upgrading of local suppliers and other linkage partners in developing countries as an integral part of their business strategy. Greater integration of the two perspectives is desirable from a public policy point of view. Both results obtained interview and mail survey illustrated that many of the policies and regulations which historically have been introduced to attract FDI and facilitate linkages rest on a flawed understanding of the dynamics of linkage creation and which actually inhibit their effectiveness. Therefore, in order to ensure the effectiveness public intervention in local linkage creation and benefits, it is essential to further seek integration between the business and development case for inter-firm linkages. The literature integration leads to an aggregate understanding of the cost and benefits of linkages.

The third, adoption of the triangulation method throughout the research process has proved a powerful research methodology for this research of local linkages and technology transfer. The qualitative method brings in-depth knowledge about relationship characteristic and linkage process where MNEs interact with their local network partners, while the two quantitative analysis i.e. logistic regression and linear regression methods add robust generalisation of results based on a number of firms.
Both methods complement each other to provide a complete figure of linkage benefits and through this process enable a stronger validation of results.

Then, the findings provide a better understanding of the role played by MNE subsidiaries in the development of local firms and economy, and why their impact might not be as positive as it could be. The results show that accompanying with FDI, MNEs do create arm-length or long-term relationships in Chinese petrochemical industry. Local linkages MNE are not only pecuniary, but may be also technical, informational, managerial and financial. The integrative evidence reviewed early shows considerable variation between firms in the degree of local orientation, collaboration intensity and resource transfer. On one hand, there is existence and considerable sourcing and sale of MNEs in China's petrochemical industry. On the other hand, management and technology transfer has been diffused to limited local enterprises, and hence the overall impact potential seems small due to the limited collaboration and resource transfer. However, it has to be accepted that the extent of technology transfer and collaboration associated with FDI is probably at the level expected, given China's developing country status and level of technological capacities. Moreover, forward and horizontal linkages are found to be equally important channel of knowledge transfer as backward linkages.

The fifth, this research develops previous research on identifying a variety of factors in shaping local linkages, including strategies and firm-specific factors of MNE and subsidiary, country of origin which represents home market environment, host country and region environment. Various predictions before empirical investigations were not all supported and very complex results are revealed at the end. For all the firms, the factors influencing foreign subsidiaries' strategic orientation include the key and moderate categories, whereas the factors influencing the quality outcomes in terms of resource transfer degree and local collaboration intensity only include the key category. This research finds that firm-specific factors, firm age and country of origin are key factors to explain the variety of MNE subsidiaries' local linkages; MNEs' partially-ownership entry is significantly related to their local orientation which is somewhat contradict to previous studies which mostly found no significant effect; the regional differences
suggest the intra-country variation of business environment in China, and show different implications for MNEs' linkages behaviour and potential for linkage development; among the location-specific factors, industry agglomeration, technological capability and government's support rather than compulsory policy and financial incentives seem to be central to the distinction of both strategic orientation and outcomes; regional differences in terms of customer/market potential and cost factor are closely related to strategic orientation only. In all, the importance of firm and location-specific factors is equivalent, and more prominent to the variation of MNEs' linkage quantity in host country rather than the linkage development potential. Not as claimed in previous studies of international business, current policy intervention by government is not greatly helpful in enhancing quality of foreign-local linkage in Chinese petrochemical industry. Other complementary factors such as the use of single supplier and specialization of input/output can specifically explain local collaboration and resource transfer. Consequently, the results suggest that there are empirical circumstances that foster the quantity and quality outcomes in local linkages. These circumstances include an open economy rather than a closed domestic market with efficient and supportive government role, a supportive and technological industry environment combined with market forces compel MNEs to anticipate cost-competitive in the long-term. Explicit consideration on various categories of factors enables the research to tease out the reasons behind the heterogeneity of MNE and their behaviours, consequently, its divergent effects on host economies.

At last, the results suggest that the interactions between local orientation and quality outcomes are interrelated but not fully significant. Although many foreign subsidiaries do have local relationships, they do not transfer knowledge at all to their local network partners; foreign firms may have substantial volume of local transactions, but technology and skills are diffused to very limited number of local firms. This implies that benefits derived from transactions and resource transfer will be different for local firm. A large share of local sourcing and sale does not necessarily result in the best quality outcome for local firms. Instead, firms can benefit more from a small amount of quality relationships. Considering the discrepancies of antecedents, same intervening
conditions have different implications for these two series of linkage variables, which will influence on the trade-off between quantity and quality of linkages. Quality outcomes in local linkages are the results of MNEs' emergent strategies responding to the competition, rather than simple accumulation of sourcing and sale in the host country. Local sourcing and sale obviously increase the local value-added activities and incomes, but less predicative of resource transfer. The positive effects of local orientation though indicate that MNE subsidiaries will create development potential on host economy along with increasing local involvement in production and marketing linkages. The greatest benefit of local orientation is the stimulation of collaboration between MNE and indigenous enterprises, and foreign presence brings not only competition but collaboration to their local rival firms.

6.2 Implications

Although this research is not practise-focused, implications especially policy implications do arise for MNEs, local firms and especially local governments. Linkage creation and knowledge building in international business is gradual and cumulative. It is should be noted that the results of one single research can hardly be used to offer general recommendations, since local linkages depends on a multitude of factors and vary with each situation. As China is a major developing host of FDI, the findings have wider implications and provide examples some other transition economies.

6.2.1 Theoretical implication

Through the empirical examination, theories applied in this research that purport to explain variation of local linkages are found incomplete. TCE and Eclectic paradigm posit drivers that lead firms to engage in transactional linkages and determine the strength of relationships, but the general logic is one of forcing organizational structures on another firm rather than on deep linkages as offering benefits to participants. RBV and strategic network approach are accountable for the benefits of local linkages as the reason why foreign firms seek them out. Deep linkages offer a strategic response to
particular kinds of uncertainty that organizations face. Using local relationship as a tool, foreign firms can improve quality and control costs in their manufacturing process, and seek to gain a competitive advantage relative to other firms in the same field. However, these approaches focus on the benefits of these ties and does not explain variation of linkages, that is, why firms have relatively more or fewer linkages in the host country. Examinations on attempted causal relationships provide evidence that it is not just that there are characteristics peculiar to firms and to their environments that drive local linkages, features of the transactions, of changes within specific relationships lead to close linkages with local suppliers and customers. However, these factors conducive to linkage quantity are devoted to MNEs’ initial entry and successive sourcing decisions, but found to be less useful in explaining the development potential of local linkages, which are inclined to be more dynamic and emergent actions. This reinforces the need to discriminate quantity and quality of local linkages, to develop conceptual framework to explain the links and trade-off between them, and especially to explore mechanisms of resource transfer between foreign and local firms.

6.2.2 Implications for MNEs

Because MNEs are at the centre of this research, implications for MNEs are put first. Host country government in China pay higher and higher attention to the development of created foreign projects, and have recently launched new guidance and policies to encourage local linkages. By investigating how MNEs contribute to the host country’s development through their local linkages, MNEs have an increased bargaining power in investment negotiations. MNEs are usually less aware of the potential benefits they have on the host economy where they operate. This research raises the understanding of MNEs’ role in the development pattern of local firms and industry, and also how they could best benefit from such changing environment. What seems crucial to make value chain relationships evolve and become fundamental vehicles for knowledge transfer is a combination of efforts by both local and foreign firms, aimed at increasing local competencies and adapting technology to host-market conditions. The policies to increase local linkage of MNEs are inherently intertwined with the strategies of the MNEs.

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During the 1980s, EJVs were the preferred mode of entry for many Western firms. As a result of the improved performance of the Chinese market mechanism, the diminishing need to rely on Chinese partners because of the acquired experience on how to do business in China, and the relaxation of the foreign ownership control by the Chinese government, wholly-owned FIPs have become a first-best option for many foreign multinationals. It is likely that Chinese official who looked at joint ventures as a way to assure a high degree of integration in the Chinese economy and maximize the benefits of the transfer of technology will interpret this shift to WOSs as an evolution towards shallower local embeddedness. To avoid a possible restrictive backlash by national and local authorities, foreign MNEs should try to find other means of closer integration with the domestic enterprises, e.g. by linking up more with local suppliers.

China is also too vast and varied to be considered as a single market. There are also very different cultural, economic construction environments in different regions. Different provinces may have different regulations related to foreign construction activities, different requirements on contracting procedures and different taxation policies. MNEs must be aware of these regional diversities and accumulate specific local knowledge in each region.

6.2.3 Implications for local firms

As this research focuses on the MNE’s perspective, locally owned firms can learn from the existing network of MNEs, and the potential benefit they can obtain by linkages with MNEs. The result implied the importance of purchase-related and product-related factors in enhancing technology and skill transfer to local firms, and the role of location factors influencing on linkage creation and transfer. These findings suggest the main problems MNEs are mostly concern with, and hence how local firms could establish long-term linkages with foreign firms, particularly become suppliers and collaborators to MNEs. This research highlights the conditions of local firms under which local linkages and transfer could be maximized.
This research shows that there are a small number of inter-firm relationships in the petrochemical industry, and MNEs prefer to work closely with them once the business partner is selected. One of the primary criteria of MNEs to select a network partner is obviously the technological capability of the firm. Meanwhile, many studies have shown that a smaller technology gap between local and foreign firms increases the likelihood of linkages and transfers occurring due to better production capability and quality. Technical assistance and knowledge to local firms is more widespread where local firms have relatively more capabilities. It can be seen that MNEs are more likely to invest relatively more resources in upgrading linkage partners who have ability to produce higher-technology and specialised products. This research found that however, in China's petrochemical industry fewer specialized products are sourced locally than internationally via foreign parents. This has important implications for the local firms that it is important to improve their competitive edge at international market. If competitive local firms are available, MNEs will start relationships with them, and contribute the further upgrade of these local firms. But if there is a shortage of reliable local partners, MNEs will easily substitute them with other foreign-owned companies, or import direct materials. Hence, the primary objective of local firms is to set up systems to develop efficiency and technological capability so that the local firms can take advantage of the links with foreign investors. The local capability potential mush exists in the first place for MNEs to further contribute to its development. MNEs will then be a position to contribute to further development of the existing endogenous production capabilities. The previously large and successfully managed local partners strengthened their bargaining power by increasing the local content of joint-venture project. This was particularly noticed when the previous products of the local partner were similar to those produced by the joint ventures. Their pre-existing level of technology and supply networks had enabled them to bargain for the use of local supplies to reduce cost.

6.2.4 Implications for host country government

Although the overall extent of local linkages is at limited level, substantial opportunities exist for increased technology transfer and collaboration if the right factor settings are in place. In the process of formulating and implementing policies towards linkages,
governments firstly need to analyze the current characteristics of local linkages established by MNEs, including the level of local embeddedness of foreign subsidiaries, the intensity and breadth of the linkages. Policy makers of host country need to understand that FDI stocks and inward flows are not necessarily correlated with long-term beneficial effects on local industry. With a better understanding of inter-firm linkages between MNE and local firms in host country and factors shaping these linkages, host government would be in a better position to focus on the right companies, launch and improve the soft policy and specific schemes in order to maximize the positive benefit. Generally, host country’s policy framework aiming to promote MNEs’ value chain activities and linkage effects should be capable of attracting more foreign investment, ensuring an appropriate selection of MNEs investments, and by developing local capabilities and absorptive capacities.

As the quantitative and qualitative characteristics of linkages depend very much on the characteristics of MNEs and their subsidiaries in the host country, attracting the investment of better linkage effect is crucial. Therefore governments increasingly need to develop flexible policies encouraging foreign projects with significant strategic roles in their economies, rather than only adopting policies applicable to all MNEs. Furthermore, certain types of petrochemical firms with critical strategic orientations toward host market have a significant presence in the region. Another important consideration for less-developed countries is that attempting to attract inward investment from export-oriented and technology-intensive MNEs may not result in high quality linkages. It needs to be considered in association with products and relationship nature of the linkages. In addition, governments also need to refine their policies to distinguish between new and existing investors. It appears that it is not enough that MNEs have an extensive and lasting presence in a country to favour the creation of knowledge intensive relationships with local firms; nor is it enough that foreign firms get involved in massive market transactions with local firms, if foreign firms concern low cost and low value-added goods.
This research reveals the strong regional imbalance of China's economic development over the past decades. It confirms the need for appropriate local conditions to optimise the benefits from local linkages. Within national boundary of the host country, there may be huge variations in the capabilities of local industry and firms to link with foreign MNEs. This is particular the case in Chinese petrochemical industry. The development stage of regional location in China is wildly differing in market size, skilled labour, R&D activities, foreign-local collaboration, and government role. The differences exist even across industry clusters. Firms investing in different locations pursue different local linkages in an attempt to maintain or strengthen their core relationships in the home base. In order to facilitate local linkages, a host country has to offer not only distinctive resources to foreign investors, but also a motivating environment for networking. This research lends support to ideas that competition between firms lying in the industry agglomeration has been found to contribute to a stronger linkages between foreign and local firms. Specially, intensifying competition among the investing MNEs offers the Chinese side a favourable position to bargain for technology transfer. Judging from the types of firms dominant in these clusters it is important that policy makers endeavour to sustain a competitive environment with both local and foreign firms, in order to encourage inter-firm cooperation via linkages. Indeed, with the competitive foundations in place, further policies targeting partnerships and knowledge sharing between foreign firms and local firms can be implemented. Extensive vertical linkages are also stimulated through public investment in the quality of infrastructure, and encouraging cooperation between foreign-owned and domestic firms. Although the Pearl River Delta experienced a strong growth in inward investment from 1997, the 2004 figures demonstrate a slowing down of this trend. In addition, other regions such as Bohai Rim and Yangtze Delta appear to be becoming increasingly successful in attracting petrochemical projects, which is partly because of the effect of industry quality and market expansion on increasing linkages degree in these two regions. A host country lacking such an environment should consider providing some interface mechanisms that induce relationship building.
Policy-makers in host country should be realistic about the likely impact of traditional incentive and compulsory policies on which China's inward FDI has relied. Assessment on local orientation and resource transfer in this research suggests that the Chinese government policy has had the effect of encouraging the quantity rather than the quality. As part of the existing policy framework, compulsory and financial incentive-based instruments mainly enhanced local firms' involvement to international value chain, rather than generate development effect through working with MNEs. Governments of developing countries often favoured joint ventures over wholly-owned FDI projects believing that active participation of local firms facilitates the absorption of new technologies and know-how. However, joint ownership is losing ground to wholly-owned arrangement because of increased knowledge about the market environment in China by western investors, and Chinese government needs to adapt its policies on the accession to WTO. This research provides no strong evidence for encouraging joint ventures in order to maximise the impact of FDI for the Chinese petrochemical industry as ownership type indicates influence on local linkages, but no significance role to determine knowledge transfer. This is in line with the literature suggesting that foreign investors tend to put more resources into technology transfer to their wholly-owned projects than into joint ventures, and subsequently, higher technological content of wholly-owned may outweigh the diffusion benefits of shared ownership. Local content rules can only alleviate the linkage quality weakness to a limited extent, as no evidence was found that they greatly help to increase knowledge transfer to local firms. More important, such local content rules may negatively affect the volume of manufacturing investment which implies that their overall effect on the development of the local supplying industry may even be negative. Since the open-door policy during the last two decades of the previous millennium, China increasingly sought to attract FDI. Particularly, Pearl River Delta as the earliest open zone has been recognized as the most attractive destination of FDI. However, this region does not have the best quality of FDI in terms of collaboration intensity and knowledge transfer to local firms, which is due to product structure of petrochemical industry in this region is highly cost-oriented, and lack of innovation and connection with rapidly growing inland markets.
Using and strengthening scale and quality of local linkages call for new approaches, going beyond the earlier generations of investment promotion policies. The new generation of investment promotion policies should proceed to target foreign investors at the level of industries and firms to meet foreign firms’ specific needs at the activity and cluster level, in light of a country’s development priorities. With regard to petrochemical industry in China, government needs to emphasize the competitiveness upgrade of indigenous industry, and must provide strong and efficient infrastructure, both physical and institutional, to support that need. This requires the government to work closely with private industries to identify and supplement the areas where key supporting suppliers of goods and services are urgently needed but not sufficiently provided by the market. As networking is a cumulative process, the initial connections between two unfamiliar networks will be most difficult, and extra help from governments is often desirable. Although the central government has a decisive role to play, the provincial government should also resort to special promotion programmes to facilitate the relationship establishment between foreign and local firms. These programmes will not overcome the primary barrier to greater local sourcing by MNEs, namely the problem of availability, and are therefore unlikely to bring about large improvements in the overall level of local linkages. Such programmes can be most successful if they work closely with both MNEs and local enterprises, reflecting their mutual needs and interests and incorporating their available resources. Moreover, the Chinese government made little effort to encourage local organizations to enter R&D collaboration with foreign investors, which could reduce the attractiveness of technology-intensive FDI and therefore, the potential for technology transfer.

Chinese firms’ production, supply quality and legal issues are sure that most critical problems causing the distrust of foreign firms on them. Therefore, government ought to adjust the direction of investment attraction tools and improve legal environment to ensure the technological advantage of inward FDI, which will consequently increase the external competition pressure of local firms. Another measure is to use various incentives to encourage local enterprises’ input on R&D and innovation. Government
service assistance could offset the local enterprises' weakness in information absorption. Restructure need to be reinforced toward industry integration and inter-industry linkages.

Although this research focuses on a specific country and results are partly consistent with previous findings, it may have important implications for the general literature on international analyses of the links between governance, strategy and internationalization. The last two points of findings may apply to other firms or industries. The sample in this research covers the major nationalities and the major products in the chemical sector considered. These foreign firms do not behave very differently from each other comparing with indigenous enterprises in the host country.

6.3 Limitations and Recommendations for Future Research

After drawing policy implications, this research should be emphasized that it has been limited to certain defined nationality of subsidiaries and focus on the downstream petrochemical industry and that the findings may not be easily generalized to other industries and investors. An extension of the study to different countries or regional contexts will be fruitful to see how and why patterns of linkage formation differ and the suitability of different types of linkages in different contexts.

More work needs to be carried out to create and test the influence of other factors in further studies that are more likely to capture the diverse characteristics of subsidiary and external environment. Research should refine approaches to measuring firm-specific variables to address inconsistencies and gaps in research findings to-date. Although this research adds weight to the argument that firm-specific factors, e.g. entry mode and country affect on MNE’s linkages, further investigation should be conducted to find out the reasons behind or complementary to these control variables. Otherwise, it is difficult to make specific recommendations for policy-makers. This means further research should be undertaken so that a more robust framework for determinants of foreign-local
linkages could be established. For instance, foreign subsidiaries’ various strategies, roles and organization environment can be further studied at the firm level and ought to include more precise accounts of foreign affiliates. In particular, it would be profitable to examine the strategic elements of FDI decisions in terms of governance structure and subsidiary autonomy and to identify other influential variables in order to maximise the potential beneficial effects of such investment through the development of local linkages.

Another question on local linkages analysis is whether the sub-nation is actually the most appropriate scale at which to address the issue. The availability problems observed in numerous regions indicate clear limits to the possibility of MNE plants sourcing locally. Hence it might be more realistic to implement local linkage initiatives at a larger or smaller geographical scale, and embrace other regions in China, such as the Central, and Western of China that presents more diverse macro environment.

As the creation of local linkages can potentially lead to considerable positive effects since establishment and along development, it is critical that further studies are devoted to identifying the factors that help explain these processes. A more qualitative research design might elicit the kind of information that is required. It is individual firms that choose to develop both local and more distant relationships and, therefore, it is necessary to view regional network connections as a collective outcome derived from the choices of different sets of individual economic actors (Oerlemans et al., 2001). Apply this view in FDI perspective, MNE is not the only one to determine the relationship with other firms, but also local firms of host countries have their own desire to influence the linkage pattern, which induce the importance of relative bargain power.

It is likely that linkage pattern of foreign subsidiaries may change, as the business environment and the strategic tasks change over time. A deeper interpretation of these results calls for further research on the evolution of market structure in the host economy and on the actual behaviour of MNEs active in that market, and possibly comparative works on different recipient economies. In addition, this research implicitly assumed that subsidiaries employ exclusively one strategy at a time. However, there may be a case in
which subsidiaries use a mix of local strategies simultaneously over time. This limitation can be addressed in the future research by collecting the information on a longitudinal base.

With respect of methodology issues, this research is firstly limited by the availability of data and low response rate. The potential bias of individual researcher in the field interview was also recognized. Moreover, a multiple case study approach of both foreign subsidiaries and local business partners should be chosen to search for a balanced understanding of the research questions (i.e. from both sides) and permits a comparison across cases (Yin, 2003) in the future. This would help to understand the nature of linkages from the local firm’s perspective, and to what extent linkage effects actually occur. This study advances a more encompassing but simple classification scheme of linkage and transfer combinations. This classification needs further operationalization and validation in order to be easily replicated to generate more insights into an integrated theory of subsidiary strategy, embracing dimensions of local linkages and entry strategies. Defining the measurement for local sourcing has considered the foreign nationality of local firms in the host country, but locally procured items themselves are often either imported or embody a large portion of import content. Hence, the measurement for net ‘local sourcing’ needs explicitness, in order to capture net linkage effect.

Finally, while taking account of the presence of foreign subsidiaries, this research considers the effect of their activity on the degree of resource transfer to local firms, however, after all it did not verify the final effect on productivity of local firms. The findings of this research could be advanced further if the identified local linkages strategies were linked to the subsidiary performance in the host economy. If many foreign subsidiaries located in a host economy fall into one or multiple types of linkage pattern with local firms, the implication of these linkages on subsidiaries’ performance could be an important issue to be addressed and which will derive more implication for MNEs. Moreover, local relationships especially forward linkages between the MNEs and local customers have been given deficient analysis due to the difficulties of data
collection. Cooperation with local authority in China may help researchers to obtain more sufficient data regarding to the interaction and learning between foreign firms and local firms.
Appendix 1 Interview questions guide

1. Company Name:
2. Location (city):
3. When did the company register in China (when is foreign share join in if it was acquired):
4. The ownership type: Sino-foreign joint venture/Wholly owned subsidiary
5. Equity share of ultimate foreign parent firm(s):
6. Chinese partner (in JVs) Ownership: State-owned / Group-owned / Private
7. Major business activities:
8. Yearly production capacity:
9. Position of respondent(s)
10. Allocation of managerial positions

11. How to describe the environment of the regional market, in terms of the location specific factors below

<table>
<thead>
<tr>
<th>Location-specific factors</th>
<th>government facilitation and impediments (please specify any particular instruments)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market size/potential</td>
<td></td>
</tr>
<tr>
<td>Local technological capability (expertise and skilled labour, R&amp;D investment)</td>
<td>Stable and quality supply</td>
</tr>
<tr>
<td>Urbanization level</td>
<td>Degree of industry agglomeration</td>
</tr>
<tr>
<td>Advancement of transport</td>
<td>Low cost advantage</td>
</tr>
<tr>
<td>Policy incentives (Please specify)</td>
<td>Natural resources (e.g. Oil, electricity)</td>
</tr>
<tr>
<td>Volume of economic activities</td>
<td>Local industry agglomeration and support</td>
</tr>
<tr>
<td>Volume of foreign activities</td>
<td>Other factors (specify)</td>
</tr>
</tbody>
</table>

12. Using the following table, could you indicate how important these benefits receive through joint venture with Chinese firms

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Not at all 1</th>
<th>Minor 2</th>
<th>Moderate 3</th>
<th>Important 4</th>
<th>Very important 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economies of scale</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accessing technology and expertise</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access financial capital</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accessing local knowledge, information and learning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accessing larger customer base</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevent competitors from emerging</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expand capabilities to meet quality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ensure lower prices of inputs or outputs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide contacts to local government</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sense of community &amp; legitimacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share R&amp;D costs and shorten design and development stages</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others (please specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
13. Overall orientation of sourcing, sale and collaboration.

<table>
<thead>
<tr>
<th>Percentage of Procurement</th>
<th>Percentage of Sale</th>
<th>Number of Collaboration with firms/organization (in last three years)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

14. Of the total input, how much (percentage of the total input) is imported and from which geographic area in each of the following product categories

<table>
<thead>
<tr>
<th>Raw material</th>
<th>Home country/market</th>
<th>Other Overseas countries/regions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other chemical compositions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment and facility parts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology/skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

15. This set of questions is to investigate the characteristics of major local relationship, including relationships with suppliers, clients (including distributors, logistic companies), collaborators (other enterprises, local research institutions government agencies, industrial associations). Please indicate five most important local firms of each category.

<table>
<thead>
<tr>
<th>Company name</th>
<th>Location (city)</th>
<th>Nationality of ownership</th>
<th>Notes for interviewer</th>
</tr>
</thead>
<tbody>
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<td></td>
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</table>

16. Have your company ever experienced any significant changes in the relationship with these local firms, and the main reasons
Appendix 2 Additional information about the 17 company cases

Case 1: Japanese, 1999, WOS, Jiangsu, polyurethane sports field surface

It is the main manufacturer of the specialized by Ministry of Chemical Industry and State Physical Culture Commission. As market leader, the MNE is motivated to invest in China by the local cost advantage. Competitive price is a long-term strategy of selling their products and services. Presence of foreign companies is also an important factor to enter and develop the local networks in China.

As a subsidiary, this company appears to be granted limited level of autonomy in supplier selection. The company has strong reliance on parent firms’ technical strength, advanced production equipment, detection means, and professional team. After contracted technology transfer from foreign parent at the early stage, the current applied technology an innovation is created inside of the local economy by the subsidiary itself. Based on the MNE’s previous distribution operation and branch office in China, this subsidiary is completely independent from local intermediates.

The company’s sourcing and sales are significantly based on the home market. The company respectively imports and local procure 50% of its total input. In the local networks in China, Japanese firms remain preferred suppliers especially for sourcing the critical raw material. The interviewee indicated specific problems of local Chinese suppliers which hinder the intensity of supplier relationships: lack of flexibility, lack of technical expertise, and difficulty to meet quality requirements. The subsidiary mainly produces for Asian markets. Local sale is much lower than the export to overseas. Its products are selling in twenty foreign countries including Asian-Pacific region and Europe. Increasing of price and cost induced the production shrunk in Japan and production transferred to Chinese operation. The company provide systematic service including plan, design, build for clients, such as previous advisory, financial budget to optimization, design drawings, foundation construction, the plastic roll-out of maintenance training, ‘one-stop’ service system.

Case 2: Japanese, 1997, Guangdong, WOS, Polyester resins

This Japanese MNE having profound origin with Chinese culture, made its presence in China when China just launched the ‘reforming and opening-up policy. Foreign companies are fighting a fierce battle for market share, with international brand names arriving through the 1990s with some brands already making a name among Chinese consumers. According to the interviewee, the company’s business in China grew 50% in 2007, while its productivity increased five times after the company built new plants and extended existing factories in Shanghai and Beijing.
Cost advantage of production is ranked as important as market factor which motivate the Japanese parent firm to invest in China. During development of 10 years, this subsidiary is basically sewn up between other local operation and importers. It is claimed that the environment factors as the most effective antecedents of networks in China, including regulation requirement by government and authorities, environmental uncertainty, and improve reputation or congruence with prevailing norms in institution environment. The parent firm in Japan involves significantly in critical area of decision-making, for instance, supplier evaluation, marketing strategy and technology control. 'The core technology of production is controlled by foreign parent firm and latest innovation fruit transferred from the R&D centre in Japan, which benefit new product exploration or development for us'. The branch office located in Beijing is not involved in any production, but play a role as headquarter in China in order to coordinate intra-firm and inter-organization relationships.

Three major Chinese suppliers in China are identified. As highly dependent on home market, 60% of inputs are procured from parent firm and other suppliers in Japan. Local supplies of the company in China are mainly located in Guangdong province. Attitude on strictly technology protection is also reflected by the company's conflict with suppliers 'one emerged issue we consider as untruthful behaviour is by current suppliers, giving away our technical index, and this happened recently made us to terminate contract and turned to another alternative company'.

'Our sale channel was previously limited to upscale urban cities, which were the most important consuming markets of petrochemical products. On the other hand, medium and small cities scattered throughout China have suddenly emerged to become a potential market as a result of rapid economic development in China in recent years'. Another critical characteristic of local linkages is distribution channel is completely internalized in the company, including from headquarter to sales offices and to customer or clients, the interviewee explained this as "the intrinsic strengths of our company lies in high quality products and providing the finest service, which represent in this way, to firmly establish linkages through coming directly into contact with clients". 4 sales offices are distributed in 2 provinces, and 'these linkages are controlled by highly hierarchy principles'. Furthermore, it is an important supply centre for South Asian and U.S. markets, which consume almost 54% of local output.

Case 3: U.S., 2003, WOS, Hebel

The parent MNE engaged in multi area of petrochemical industry. During four years operation from 2003 in China, it made a prominent change in its local network strategy. At the time of entrance, the company decided to import products made in Singapore to offer in Chinese market. Although this ensures product quality in certain degree, the logistics cycle is long so that brought tremendous pressure to the distributors and sales dealers. Thus, in 2006 it led to business suspension in mainland China, until the new CEO was on board and adjusted the direction. The new strategy concentrates on product development according to
the demand of local customers and selected more effective supply chain. At the end of 1998 the company set up R&D centre in Singapore with a first-class technical personnel and equipment, so that the company realized intra-firm technology development and innovation of systematic in Asian market.

It is seen from the interviewee’s explanation that forward linkages such as relationships with subcontractors and franchisees are pivotal to their success in China. In terms of the marketing linkages, there is clear hierarchy of importance placed on the management, the first and second sale dealers. There are about 16 first level business customers which directly connected with the company are indicated by the interviewee. ‘We establish a logistics-oriented marketing mechanism, by application of an advanced and integrated system which could support more than 60 clients and suppliers to run sales and logistics at the same time, so that every single business cycles is shorten to five days, and saving grand cost for all members in the networks’. These distribution and sale are based on a mix of long-term contracts and short-term transactions. At the same time, the company realized its sales force comprehensively localization for local market. And according to economy disparity cross regions and cities, the company introduced two different systems to meet different market needs. The company has formed the strategic layout of ‘Multi-location bases’ in China in order to adapt to the intense market competition. In addition to Anhui province, the foreign MNE has set up branches in central area-Sichuan province, coastal city of Guangdong and Shanghai in order to better serve the surrounding areas.

The company’s main production facilities are from the MNE’s chemical construction affiliate in China and, some material imported from Germany. As part of a major organization spanning a number of diverse sectors, the subsidiary in the case has massive annual purchasing requirements, some of which are supplied by other sister units in different countries. Purchasing from other affiliates of the MNE group overseas accounts for 25 percent of its total purchasing, while sales to other companies overseas market accounts for 30 percent of total sales. Among the 5 most important suppliers in China, one is sister-affiliate with the remainder Chinese domestic firms located in Guangdong province and Shanghai. These suppliers are essentially undertaking production processes on standardized materials and ancillary resources.

Case 4: Singapore, Hebel, 2004, chemical and engineering, WOS, 101-200 employees

The parent firm has moved the original manufacturing overseas to capitalize on the cost and take advantage of raw material and market demand in China. The move to manufacture outside Singapore consequently led to the chemical manufacturing business being run by two associate companies which are responsible for different parts of Asia. The MNE has also integrated downstream retailing on a regional network basis. The standardization of processing method and system according to international
specifications, and the realization of economies of scale in both the manufacturing and purchasing of inputs also encouraged the establishment of the subsidiary.

The parent MNE firstly show its appearance in china by established direct trading contracts with local clients when it was still exporting products to China. Since formation of equity joint venture, based on ‘abundant marketing knowledge and skills’ filled by respondent, the company has explored new forward relationships. At the early stage of JV, the affiliate imported large portion of raw material from home country and had a complex marketing networks locally. With the very high cost of import and sale management, the company had to suffer losses from selling its products at the same or even higher price than its local competitors. In order to lower the cost and improve its competitiveness, localization of the input supply became imperative. The first major step towards achieving this goal was the effort on locally producing upstream material, which now accounts for 50% to 60% in the overall procurement costs. The second step is to reduce number intermediates to the sole distributor in order to avoid repeated channel to the same region. Besides the indirect relationships with local clients, the company has been keeping more frequent contact with direct clients, and forming stable relationships with them. The deputy manager also suggests that the five most important suppliers and clients are all based in mainland China. The linked clients are concentrated in the same city and other province of neighbourhood, such as Shanxi and Beijing. Apart from these three types of relationships, the respondent indicates no other direct local linkages

As there is not significant gap of technology level between the Singapore parent firm and local partner, the affiliate focuses on adopting international advanced management systems which imported from U.S. market. According to the answer provided by interviewee, there is no advanced technology transferred from foreign parent firm, and the external linkages of R&D are relatively weak in local networks, which otherwise supported by technique department inside of the subsidiary.

Along with localization, the company’s finance and employees are mostly obtained from local Chinese market. The equal ownership on both the board of directors and the executive management committee allows the Chinese side to hold the positions of President and Managing Director, while the foreign side holds the other two important positions of Commercial Executive Director and Technical Executive Director. At the time of the interviews, there were 19 Singapore nationals among over 190 local employees. Although the two sides had different motives for forming the joint venture, both realized that the increase in production localization could help them reach their respective goals. As the interviewee explains, through the long history in China, conflicts caused by culture difference in the company have been alleviated, which is beneficial from close ethic background.
Case 5: Germany, 1996, Guangdong, 50:50 JV

The local partner of the joint venture is a wholly owned affiliate of SOE. The MNE set up the factory in China, including transferring the output from its Thailand operations to take advantage of a cheaper location and more efficient logistics. The Chinese partner’s raw material and local market are also important factors to maintain commitment in local networks building. For the Chinese partner, the JV is a milestone and turning point for its survival and development in the context of national economic reform.

During the first year of operation, the company mostly produce for international market: ‘We firstly made the step to enter the markets in Southeast Asia, South Asia, Europe, North America and other regions and establish stable customer relationships’. The proportion for local sale is increased gradually. ‘The business opportunities in Asia Pacific and Europe that is now supported by this venture, and this additional capacity will allow us to continue to grow in local markets as well as participate in new markets that, up to this point, we have been unable to support’. The business has also integrated downstream sale on a regional network basis. The company supplies products in China and overseas by using proprietary technology of the MNE. Now the company is tapping into its regional framework and expertise for all its businesses in Asia. According to interviewees, in 2006, there are 15% products exporting to North America, and 35% products are in other overseas mainly Asian markets. Part of local distribution was undertaken by a Sino-foreign JV company which had been in place for 5 years. The JV keeps direct customer relationships in distance and a few specialised customers in far provinces too. The company has a clear strategy of outsourcing most aspects of its operations from local networks, including sales and distribution were ‘owned’ by Chinese partner. Adaptation on product service specification, production planning and scheduling are claimed in response to customers’ request as many of them are SOEs and large petrochemical enterprises who have certain conventional methods. It also diversified products into four categories and various natures according to downstream application.

The JV is keeping stable contact with the MNE in order to ensure the most advanced technology and product application support within a shortest time. The venture adopted MNE’s supplier evaluation and award system to ensure their capability for specialized requirement. As the one of the country’s largest petrochemical production base, the Chinese parent firm is long-term supplier. The other four suppliers are also Chinese owned. Primarily a Chinese service supplier sequencing deliveries for other suppliers to the JV, and has just begun to undertake other ancillary services, such as spot-welding exhaust pipes for two German-based suppliers.

The JV project introduced desperately needed capital resource, as well as advanced technology for product design and manufacturing, and management ideologies regarding strategy, innovation, learning, service quality and human resource management. Regarding to the management structure of the joint venture, the company is attached with high localization of human resource. With the assent of the Chinese partner, the
Western partner sent a very large group of expatriate managers and technical personnel to the site to hold all key positions in the organization in the early stages of the JV development. As the JV has matured, the partners have agreed to employ increasing numbers of local management and technical personnel. Among the five members of the management board, three are held by Chinese partner. Governance principles have included that the two primary partners alternate appointments for the CEO position and senior management responsibility.

Case 6: Germany, 1995, Jilin, 60:40 JV, materiel for plasticizers and pharmaceuticals

The parent MNEs in China has established fourteen sole ventures and nine joint ventures. Subsidiaries in located in Yangtze River delta are the provision of services for the Chinese market and other periphery areas. Particularly, it established broad and intensive business networks and manufacture field in Nanjing and Shanghai, in order to realized scale economy in relatively short period and provide clients with basic petrochemicals of competitive standard. The R&D centre located in Shanghai play important role for the member development inside of corporate network. 'Local networks is the foundation of growth, innovation is the driving force for sustained development. And we rely on the technology platforms in its research and development units to develop and implement process and product innovations effectively'.

The interviewee understands that cost leadership is crucial to the company's long-term competitiveness. To achieve this, the joint venture relies on both technological advances in its production processes, and the inherent efficiency in its integrated large-scale plants to maintain high operational efficiency. The committed itself to transferring the technology required to set up the means necessary for the production and sales. At the first years, the Chinese partner provided the staff, technical assistance and the civil engineering work of JV plant. However, after just a few years, the Western partner's management expertise became more vital for the development of the JV, particularly in the areas of marketing and HR management (JV contract). With the help of the Western partner, the JV introduced new products and 'Westernized' systems and policies. Although the JV had planned to construct a new production base, in the beginning it produced in the Chinese partner's factory and absorbed employees from the Chinese partner.

In 2007, 80 percent of profits accredit from sale of local manufactured products. Although this case is located in Northeast of China, its customer firms spread into all of the major markets in China. There are more than 40 direct clients distributed in North and China, East coast and South China, accounted for 90 percent of its Chinese market, including other subsidiaries of the MNE. Case 5 according to interviewee, exists to vertically cooperate with these two production bases. However, its autonomy is not confined by its role in corporate network in China as decision over tactical purchasing processes is given by headquarter to subsidiary itself.

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There is significant knowledge sharing identified between the subsidiary and the local Chinese firms. During the jointly design on the manufacturing system, the foreign company contribute the advanced technique and subtract the building of manufacturing facilities and system to one local and one MNE companies. As 75% of total input are procured from Chinese partner located in short distance, the foreign company provide it with technical upgrade in material production. The marketing and sale outside northeast provinces is undertaken by local agents.

This joint venture enterprise also keeps frequent contacts with 15 local universities and research institutions all over China, and cooperate 31 technology development projects with them. In addition, The leadership role in the industry segment is assisted by the company’s formed long-term cooperation with a supplier firm owned by another MNE in the same city, with a trading contract which further reduced the distribution cost and upgrade sufficiency from local networks.

Case 7: U.S., 1998, Jiangsu, wholly owned, Polyester
The MNE's business covers the fields of international trade, storage, chemical manufacturing and engineer products, etc but core competitive advantage lies in production. It is a leading company in this industry segment owning two international advanced product lines. This is a resource and market dual motivated investment, and the opportunity for the company to pursue local linkages is affected mostly by the capability of local firm. Application of advanced management experience and first-class technology business are claimed by interviewees. In addition to full involvement in management and control of decision making, the local side has benefited from a high level of localization in many areas.

With wholly owned subsidiary offices in the primary markets of the world, it manages manufacturing and related service branches or international JVs throughout Europe and North America. The Beijing subsidiary office functions as the de facto Chinese 'centre', Its strategy is that the plant to be located in areas close to the customer, in many areas inside the large number of sites set up investment, which allows its business to have a good understanding of the market, and eventually better meet the needs of the market in China.

Since operation commenced the venture has made rapid progress towards local content in production. The MNE have accumulation of another three small and medium chemical projects in China. These manufacturing sites interact intensively with large amount of intra-firm transaction. The local content of products increased from less than 40% in 1998 to 60% in 2007 as a result of the developing local supply networks, pressure for cost reduction, and the large amount of local demand. All the main production equipment purchased from the MNE's engineer subsidiaries located in Japan and Germany. There are five key supply relationships indicated by the interviewee, of which three are Chinese enterprises located in
30km distance. Since the venture enforces high standards for supply, the local suppliers have been stimulated to improve product quality, management, and overall technology standards. This linkage effect has propelled four of the supplier plants in Jiangsu to sell their products in the international market, because these plants have derived advantages from becoming authorized suppliers of the foreign subsidiary when negotiating with other potential customers.

The plant is able to meet the demand of foreign parent firm’s current customers for these products in China, and enhances its global capacity for petrochemical production. ‘We expect a healthy growth in our market segment for these products and have an optimistic outlook for the future of the plant,’ said the interviewee. Ten local clients in China directly linking with the company are focus in large cities and open coastal area. The export markets are mainly located in ASEAN countries and North America, which takes over half of its total sale profit globally. Regarding to the marketing channel, the company’s products are distributed by logistic agents either national or international, and it establishes hierarchy relationships with 13 license sellers in China. The company provide free of charge every year to provide some key customers fabric of new products to encourage customers to design innovative products, and to assist in the worldwide promotion, customer driven the success of the fabric of New Varieties of sales, developed a benign interaction between the marketing cooperation.

Case 8: Japanese, 2002, Shanghai, 80:20, JV, agricultural chemicals
The MNE set up the JV subsidiary to meet the lowest requirement on local content of foreign firms, as well as conduct market-access objective. The MNE ‘Building these ventures in China not only reduces competition but specially allows itself to share the partners’ market power, and customer base and distribution channels’. Labour cost advantage is ranked as important as market factor which motivate the Japanese MNE to invest. In the first three years, the company suffered losses and managed to turn deficits into surpluses in 2005. From then on, the sales income began to rise steadily. More than 60% of the sales income in recent two years came from local sale.

The general manager attributes all to the policy of ‘concept innovation, brand marketing, effective investment and teamwork spirit’. The adoption of the advanced marketing management concept and methods of foreign MNE at the beginning contributed to the achievements of the company. The products made and marketed by the company embody the advanced technology patent transferred from Japanese parent firm. ‘The company is also trying to expand its export by the influence of the parent firm and its global sales networks while developing domestic market. After production facility improvement, the capacity is increased and the proportion of export is raised to the 1/3. ‘We have not only managed to turn deficits into surpluses but also maintained sustained development’. In average, the fund which is over 5% of sales income is used for new product development and upgrade of production facilities and devices.
This venture has very few supply linkages in China, yet appears sensitive to technology transfer. Because of difficulties with producing the main chemical compounds locally in early stage, the level of product localization was less than 50%, and over half of input is purchases from Japan. This subsidiary only purchases 25% of raw material from produced by the Chinese partner.

However, the local SOE partner has the support of the Shanghai municipal government. It possesses close linkages with a dozen enterprises in other provinces by means of coordination or alliance. The venture provides the same type of products as the local partner, and these products have a huge domestic market due to state policy emphasis on the development of agriculture, which is still a vast and vital economic sector in China. The local partner's economic and marketing strengths and China's huge market brought about the establishment of a research laboratory in Shanghai.

In order to coordinate a number of subsidiaries operating in China, and requirement in technology and production, the MNE established a wholly owned trading subsidiary in Shanghai. This is an integrated unit of storage and distribution aiming to coordinate with existing operations around the world working very closely together with scattered sale offices and Chinese associates. The company also has a few alliance and cooperative relationships with local agents.

**Case 9: Korean, 2001, 80:20 JV, Port Industrial Park, Tianjin**

It is seen that the interviewee considered most of the motives as equal important. The multinational activity is related to cheap factor supplies, export platform and on the other hand, domestic market access in China. 'These factors are essential for our location choice for investment. Tianjin is an ideal city for our petrochemical project where favourable policies are offered in industry park to encourage FDI projects', the interviewee suggested, 'the college graduate, the railway variables and trade share are positively perceived, and the agglomeration of Korean companies in this area gave us more confidence to invest in this project'.

The degree of sourcing from local Chinese companies is at 36% level of total. All the production equipments of the company are imported from pre-existing suppliers in South Korea which introduces world-class advanced technological process and production management methods. Purchase of material from local suppliers has declined by 20% since 2003 relative to direct imports from Japan and internal supplies from sister plants established in recently. This move is partly due to the cancelation of local content requirement and the centralization of corporate strategy. Customer relationships of the subsidiary are global-oriented with export rate 40%. Its major markets are ASEAN and U.S. countries. The regional distribution and sale of the MNE dependant on other 11 branch offices and nine after-sales and maintenance centre owned by the Korean parent firm, thus ensuring parent firm's control from production to sales and after-sales service of all the overseas operations.
The Korean subsidiary has a ‘consolidated’ basis for local cooperation especially with local community and government, the word used by the interviewee, and he also ranks personal relationship as the most important linkage as supplier relationships for their operation in China. There is an important cooperation scheme of the company with the local government and another three joint ventures in Tianjin, named ‘strategic cooperation agreement, in Tianjin, aiming to further strengthen bilateral cooperation, actively promoting a new cooperation project among them.

**Case 10: U.S., 2000, 50:50 JV, high-tech industry zone, Jiangsu, Eastotac resin**

The MNE has regional headquarter and technical service centre located in Singapore, and another joint venture subsidiary in China, producing downstream paints, adhesives and plasticizers.

The equal ownership on both the board of directors and the executive management committee allows the Chinese side to hold most management positions including of Vice president and General Manager, while the American side holds the other two important positions of Commercial Executive Director and Technical Executive Director.

It is the first affiliate of the MNE outside of US producing the Eastotac resin, which is motivated by the growing and mature of Asian economy. Previously, all Eastotac resin was produced at the MNE’s manufacturing site in Texas. Most of its customer relations in Asian-pacific market have transferred to this Chinese operation. Improvement has been made in both form and package; moreover products from this joint venture have such advantages of reliable supply, short delivery time and more competitive price. The company focus on high quality products and innovative solutions for all customers. Besides, the site focuses on adopting international advanced management systems. The venture takes advantages of the low production cost, the abundant feedstock resources and the good auxiliary facilities of utilities available in Chinese partner enterprise, and importing from American partner’s specialized material and the proprietary production process which meets the environmental protection requirements made by both the American and Chinese governments.

During the first years of production, the products from the joint venture are mainly exported to overseas market including Asia Pacific, Europe, and the Middle East. With the growing Chinese economy, the proportion for local marketing has been increased gradually to 48%. The JV plant package was imported from U.S. parent firm with the transfer of series derivatives technology. The JV purchased 64% of its input from the Chinese parent firm; 36% of technology and specialised intermediate products from the MNE. The interviewee suggests the synergy and long-term business relationship established with SOE partner, which ensure a stable and efficient supply of raw material in China. The two partners have known and established close linkages since the company registration in 1998. During a few years of successful
transactions, the two parties have adapted their behaviour extensively to each other, in terms of business routines, planning systems, information, etc. The important local suppliers are all Chinese enterprises and the JV’s relationships with them are largely based on mutual commitment and the readiness to change them is very low. Local sourcing is mainly decided by the venture itself. It possessed of a marketing team and collaborated with an international logistic company on transporting and warehousing for customers.

This venture seems to have great impact on the developing of downstream industry in Yangtze River Delta. For example, 4 paints and adhesives chemical enterprises have been established afterwards in the same city and Shanghai, and then become important clients of this JV. The second manufacturing JV started operation in 2004 which integrate production capacity of previous affiliate in Malaysia. It produces downstream products of resin, which also stimulates the needed for capacity extension of the case, as reported by the interviewee.

In terms of local technological benefit, this company provides a salutary example. The foreign parent firm transferred the most advanced technology to the subsidiary. ‘The plant is identical, both in design and operation process, with our plant in America and is tied into parent firm’s global operation’. ‘That means our customers will get the same consistent, high-quality products that they have come to expect from us.’ Early on, the technology gap in the petrochemical industry between China and advanced countries was very large (estimated by the interviewees as a 30-year gap). The company has since tried to improve its local R&D ability through various means, such as learning from participation in technology transfer, sending 20 local engineers to work in technical centre in Singapore, and associating with local universities and research institutes. Local technicians have made a great leap in developing the relevant technologies. The valuable contributions of this joint venture have narrowed the technology gap between Chinese and America partner, which, according to the interviewees’ estimation, at present has been reduced to only a few years.

The company started strategic alliance with a local university, with the support of foreign company’s strong technical stock and local intelligence to cooperatively develop quality product. This helps us to meet the strict quality requirement and meanwhile eliminate causes underlying to previous logistic strategy. Aligning with localization strategy, the company allot the university with certain responsibility during their production. In addition, there are two professional marketing alliance partners, one is under frame agreement with a B2B online platform and, the other is another marketing subsidiary of the investor operating in China. And these forward linkages are connected by this subsidiary as a general distribution agent based on long-term contract and high trust level.
Case 11: Taiwan, Shanghai, 1994, WOS

Taiwan's petrochemical industry urgently needs to digest the process through export products; many of the current manufacturers to reduce costs have seed investment in the mainland. Competition of petrochemical industry in North of China is not as high as in Southeast, but appears increasing demand, and operation cost provide us a very good landing opportunity' by the interviewee.

Marketing linkages are amongst the most priority local linkages, and personal relationships are treasured by interviewee as well. As a dependent subsidiary of the MNE, the affiliate purchase 50% of its input from parent firm in Taiwan, and spend 10% of input expenditure on equipment components and tools importing from Japan in 2007. Besides total influence by parent firm on both long term and short term decision making, the company indicate strong connection to its home country and foreign firms from home country. 4 suppliers of the affiliate locating in China are identified including critical material and ancillary material suppliers. Among them, one critical material supplier is a foreign affiliate of another petrochemical MNE who is the most important cooperative supplier in Taiwan. Furthermore, through inter-firm linkages, this FDI venture has brought along investment of correlative industry from Taiwan. 'Along with our investment, for example, 3 other companies from Taiwan have set up factories very close to us. They are already supplying equipment and some essential components to us in Taiwan'. 'This has also led these companies to explored new relationships with other demanding client in mainland market.'

The interviewee depicted that during the transactions in the past few years, they once stopped relationships with several local suppliers and turn to new ones, and described substitution of local suppliers as 'the cost difference in this industry (polymer) is decreasing in last few years between Taiwan and mainland China. We treasure supply chain established in Taiwan which could be alternatives for our local business. And we are also contacting and assessing more local factories'.

Similar to local backward linkages, forward linkages demonstrate the export-oriented nature of its investment in mainland China though China is the priory market, 52% of its revenue being accumulated locally. The company has an ambitious sale strategy toward global market. 28% products are exported to a few Asian countries, and 20% sell to U.S. market too. The company has entered secondary markets all over nearby provinces including medium sized cities and towns. It realized this market penetration by multi marketing channel including sale branches and local agents. There is no specialised input or output flows to local firms, and either significant knowledge transfer or sharing except essential product specification and technical service.

There is no formal cooperation identified. But communication and visiting embodied in major relationships are kept by high intensity and frequency to 'maintain and improve friendship'.
Case 12: Germany, 1989, WOS, Guangdong, Fine Chemical

It is seen that the company consider the environment factors as the most effective antecedents of networks in China, including regulation requirement by government and authorities, environmental uncertainty, and improve reputation or congruence with prevailing norms in institution environment.

This company is one of the few foreign companies that have nearly 20 years history of continuous involvement in the Hong Kong and China region. It produces a wide variety of products using very sophisticated technologies. Recognizing the major markets throughout China, the MNE further established liaison offices in Beijing, Shanghai and Guangzhou respectively. Its subsidiary in Shenzhen SEZ is a leading marketing and services group in the region as well, focusing on supplying industrial chemicals. In assessing motivators for their entry to China, the interviewee chose 'operational cost advantage' and 'local strategic asset' as the most important factors. The interviewee also pointed out that the company is highly dependent on parent firm in the aspect of finance capital, which indicated as 70%. Although the subsidiary is solely owned by the parent firm, the decision making is dominated by the subsidiary itself with respect to supplier decision, product development strategy.

The company has moved its strategy from cost-competitive products to higher value-added products which have affect enormously on it local orientation. As highly technology-intensive embodied in the production, which are not available in local networks, in addition to 25 percent input is purchased from Germany, 31 percent material and equipments are imported from other foreign countries, mainly Japan and Korea. Comparing with the early stage of operation in China, local purchase has increased and currently, 4 Chinese enterprises producing raw material and specialized ancillary material for the subsidiary. The performance of these suppliers is strictly inspected and monitored every monthly. Each individual is part of overall rating indicating level of performance. The results assist the managers to decide whether to keep the vendor. 2 Chinese suppliers have been maintain 3-4 years of supplying relationships to the subsidiary, and 2 relative new suppliers have 1-2 year contracts. Substantial specialized products are purchased from the local firm. And interviewee indicates their intensive communication and product technology sharing between them. The initiation of this relationship began with repeated negotiation and selection system, 'we assess potential supplier with high strict rules and choosing companies with specific conformity with us and after that communication and negotiation is important'. These relationships are maintained by frequently telephone communication and visits during production stage, which is ongoing every two weeks.

The company has a Hong Kong based trading agency to assistant the company's import and export. The company has only two local suppliers providing main material and another two enterprises supplying accessorial organs. According to interviewee, forward linkages play more significant role in their network strategy than other type of linkages. Its key customers are located globally, and over 55 percent local-
made products sell in diversified foreign countries. In 2007, it also imported 25% intermediate products from the parent firm specifically designed for European and U.S. markets. The manager responsible for supply chain indicated that development activities are highly adapted to customers’ needs and requirements and products are highly specialized according to different customers. Throughout the company’s history, the management and staff have been dedicated in maintaining well-built relationships with its customers, which has guaranteed its subsidiary prosperity. ‘The ability to adapt to the evolving business world and the well-established foundation of the Group's prosperous trading history has enabled its continued success the subsidiary in China’. ‘We are setting the standards for service excellence, professionalism and operational integrity. By introducing new ideas and concepts, it has striven to provide clients with advanced technology and high quality products, as well as efficient and first class after-sales service and professional advice’.

It is also seen that technology and innovation activities are within MNEs and between internal R&D centres. There are no important collaborations with local research institutions or other local organizations. The major collaborators are located overseas in Europe and Japan.


Advanced tech is the guarantee of high quality and production craft is introduced from Japanese partner with international level.

34% of the company’s products are exported to U.S. and Southeast Asia. The markets of the company cover a large area in China. It set up one or two sale representative offices in each province. The plant of the case is now fully integrated within Japanese partner’s Asia purchasing network. This was deemed necessary in order to achieve better economies of scale. Japanese MNE is a matrix organization which has its headquarters in China. But the subsidiary has its own local purchasing team responsible for the supplier base (quality, delivery and so forth) in its own area. Approximately 20 local companies feed into the subsidiary’s sourcing networks. Sourcing manager indicated over half of local sourcing dependent upon 4 Chinese suppliers and 1 sister-affiliate of the MNE. According to sourcing manager, 30 percent of its local sourcing is from Japan-based suppliers. Within China the input purchased from local Japan-based companies are main high-tech items including equipment and procedure control system. Linkages with other local domestic companies are limited to procurement of basic and staple material and service and they are standard resource supplier. All the major suppliers are located in Shanghai and Zhejiang province. When the venture was set up, a few of the parent company’s home country suppliers followed it to China to continuing supplying it locally.

Regarding to technology or knowledge transfer, staff training for local partner’s top management is the only way mentioned by the interviewee. A R&D department was established last year which was
influenced by local partner. However the company manager revealed its current function is not explore or
develop any specific technique, but assistant for technology application.

Since 2004, purchases from Japan, in particular, seem to be replaced by more arm's length purchases in
the local market: while shares of intra-firm purchases from Japan (total purchases from Japanese affiliates)
in China are decreasing from 30 percent (42 percent) in 1999 to 14 percent (30 percent) in 2007, arm's
length purchases in the local market (total purchases in the local market) are increasing from 16 percent
(21 percent) in 1999 to 40 percent in 2007. Such a rapid shift suggests the 'formation of local vertical links
in agglomeration in China, reflecting declining service link costs and more developed industrial clusters
(agglomeration) involving MNEs and increasingly competitive indigenous firms'.


It is equity joint venture of few formed by private parent companies of America and China. The
interviewee understood the achieving low cost production is the most important motive for MNE
investment in China.

Although the American company hold half share of the joint venture, it place great influence in
operational decision making. This was explained by interviewee that the U.S. MNE controlled the patent
right of core technology: 'All of the product use American technique formulation and staple and various
technique beacons conform'. The company has been set to introduce production equipment, automated
production lines, and senior engineer from US parent firm, and also core technique under the U.S.
standards guidance of the products Quality. The company used the parent firm's advanced management
and technology to produce international brand, high-quality but low-cost chemicals. In summary, the
MNE had a 'pragmatic internalisation strategy'.

The Chinese partner contributes the JV by its parent firms' output. Within a couple of years of its
establishment, a third of the venture's inputs were purchased local, and in 2007 the figure is as high as
80%, but around 30% being indirectly imported from U.S. and Korea. Some crucial compositions
chemicals are still imported from the parent firm. The limited amount of suppliers and distributors, local
relationships are managed efficiently by frequently contacts and realized mutual satisfaction and
agreement. According to interviewee, forward linkages play more significant role in their network strategy
than other types of linkages 'as pivotal role we are in such large area, our target is to explore and
maintain the markets and relationships with clients, in order to guarantee high sale profit. The
competitive advantage of the company developed since its establishment is the consolidated and
expanding customer base'. The companies' forward linkages include a mix of long-term contracts and
trading arrangements i.e. short-term transactions. The venture uses a number of agents locally with long-
term contract who are responsible for distribution of 70% products to most areas of Chinese market, and
also has the rights to award sub sale licenses. Apart from in domestic market, other 30% are selling to overseas mainly Asian countries through export agents.

Although the JV has no independent R&D capability, the venture claims to have considerable applied technical knowledge gained through close interaction with its customers, and a local institution. Some of its customers now request technical assistance from the venture, for instance, some design input when designing a new model. At present the company is cautious about undertaking its own design for customers, but views this as a longer-term objective.

Case 15: Taiwan, 1999, Jiangsu, 60:40 JV
The interviewee gave abundant information with regard to the selection of the plant’s locality in China. Favourable investment environment provide the MNE powerful confidence. As entering China, there were three options: Fushun, Nanjing (Jiangsu) and Guangdong. The general manager said: ‘The election of the investment environment, the election of investment partners, is half and half. The favourable policies include, tax, export facilitation, and thereafter the price promotion in industrial park. From a market point of view, is located in the economically developed Yangtze River Delta which provides the venture more choices on suppliers and provide the largest regional consuming market in China.’

According to the figure at the end of 2007, 46% of products manufactured in China are selling to overseas clients outside of china, and over half of them are mainly offering in Yangtze River district. The equipment for production line is imported from Netherland accounted for 30%, and 70% of input is purchased from the Chinese JV partner and other independent Chinese suppliers. Local suppliers make products according to the company’s technical specifications, and the company send quality-control team out to check on the quality. The quality of material supplied by local firms has improved significantly since the early days when reject rates were high.

Although highly localized, there are not intensive cooperative relationships reported by the interviewee, except the one small collaborative project with local university in 2005. The interviewee revealed that the MNE is planning to build a second plant in order to meet the actively diversified products demand.

Case 16: Taiwan, Guangdong, 2002, WOS, PTA
It is located in an industry zone along the port of Zhuhai city which is amongst the first batch of open city in China. Under the government’s focus on ‘Development strategy for South Township petrochemical industry’, this project received financial incentives. This company is based on a cost and outward looking export orientation. Low cost input underlies their internationalization advantage and strategy.
The parent MNE has a philosophy to design and develop products itself. It claimed the importance of intra-firm transactions, for instance, it buys from internal suppliers or sister plants where the proprietary or suitable external suppliers cannot found. It set up two branch offices responsible for local marketing. The Taiwan MNE is one of Asia’s largest petrochemical production enterprises. At the first several years since 2002, the subsidiary was outsourcing 80% raw material from Taiwan. From 2005, instead of reaching to these main suppliers in home country, the company has replaced one of important suppliers by a Taiwanese supplier operating in China.

Case 17: Japan, WOS, 2001, Tianjin, Polymer resin

This subsidiary has considerable in operational decision making autonomy but highly dependent on parent firm for technology and strategic decision. Similar to other Japanese firms, this company is motivated by China’s cheap labour, resources and presence of Japanese firms.

The subsidiary was based firmly on its region’s role in the parent company’s global networks and linked closely with other units. It serves the global market through its headquarter in Japan and serves as a bridge for the transfer of new products and technologies from its European, American and Japanese R&D centres to its subsidiaries around the world. The interviewee indicated that support from parent firm through headquarters include state-of-the-art manufacturing facilities, a well-equipped technical centre, and a world-class equipment assembly plant.

The company sources 45% raw materials in China, of which about half of local purchase is from Japanese suppliers in China. With its abundant experience and subsidiaries in periphery countries, the company source 25% input outside China, typically from Singapore. In the case of ancillary supplies such as container and packaging, interviewee indicated that they tends to use a local agent or distributor rather than buying or importing direct, though the parent or purchased from other countries.

In each country to which it exported, the corporate has an importer or some distributors, which in most cases was part of its parent company. These tended to be in partnership with related companies which also had relationships with the parent company. Regarding to forward linkages in China, the company places most importance on marketing its brand based firmly on the chemical’s regional identity. ‘In fact, many Japanese enterprises in China understand the market more than local Chinese firms, and very sensitive to the changes. We are controlling the rhythm of investment in time as the policy adjustments. As the increasing price of the petro, we are now prudent and not to make significant investment decisions.’ 85 percent of the company’s products are objected in mainland China, and a small share enters into North America.
The CEO and department managers in the company are exclusively appointed from Japan, who is fully responsible for the operation in the subsidiary. The interviewee marked personal relationships amongst the most important linkages together with marketing linkages. And he mentioned a few personal links outside the parent company networks, which was embedded in a number of relationships with local clients.

The interviewee also expressed his insight to the pressure to change the company's strategy, 'Japanese-invested enterprises in China are worried that expanding production in China will trigger more technology outflow, this illogicality eventually causes loss of many opportunities in the market.

Turning to the input procurement patterns by the affiliates, one finds relatively small changes overtime. The lower ratio of local linkages is consistent with the decline in the importance of local market for both sales and procurement, indicating an expansion of Japanese MNE's networks beyond their host market. This is also notable in other Asian markets, where the share of the procurements from ASEAN in total procurement increased sharply from 9 percent in 2003 to 25 percent in 2007. The main reason for local sourcing decline is 'the product cost has been increasing and the advantage is not significant any more comparing with our sites in ASEAN countries'.

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Appendix 3 Questionnaire for mail survey

1. Company Name:
2. Location (city):
3. When did the company register in China (or when is foreign share join in if it was acquired):
4. Legal arrangement of your company (tick as appropriate):
   Foreign wholly owned / Sino-Foreign equity joint venture / Sino-Foreign cooperative JV / Others
5. Equity share of ultimate foreign parent firm(s):
   1st: Nationality: Foreign stake (in JVs): %
   2nd: Nationality: Foreign stake (in JVs): %

6. Please choose the major business activities your company:
   1. Extraction of raw material
   2. Manufacturing Products
   3. Purchase/Procurement
   4. Service
   5. Sales/Marketing:

3. Yearly production capacity:

4. Position of respondent(s):

5. Please evaluate your company's regional location (one of Yangtze Delta, Bohai Rim, and Pearl River Delta) in terms of the degree of following environmental factors (tick as appropriate)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Very Low/small 1</th>
<th>Not so low/small 2</th>
<th>Moderate 3</th>
<th>High/Large 4</th>
<th>Very high/large 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional market size</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low cost/price</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural resources (e.g. Oil, electricity)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local technology capability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advancement of infrastructure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial/Credit FDI incentives</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government regulation requirement (e.g. import duties, local content rule, local partner requirement)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government's assistance (e.g. trade exhibition, foreign sector program, co-development scheme)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local industry agglomeration and support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other factors (please specify)</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
6. Please indicate the geographic distribution of sourcing, sale and number of local collaborative agreement with local firms

<table>
<thead>
<tr>
<th>Sourcing from</th>
<th>Chinese firms/organizations in Mainland China (including foreign-Sino joint ventures)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Please indicate with the percentage (0 to 100%) of local procurement from Chinese suppliers against the total purchase in last financial year</td>
<td></td>
</tr>
</tbody>
</table>

| Sale to | Please indicate with the percentage (0 to 100%) of local sale to Chinese customers against the total sale in last financial year |

| Collaboration with | Please indicate with Number of Formal Collaborative agreement with Chinese firms/organization in last three years |

7. Please indicate the degree of resource transfer (three types) to Chinese firms in Mainland China

<table>
<thead>
<tr>
<th>Type of resource</th>
<th>Degree of transfer</th>
<th>1. None</th>
<th>2. Some</th>
<th>3. Substantial</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hardware (equipment, machinery)</td>
<td>Knowledge (license, know-how, documentary, advices)</td>
<td>Software (training, assistance by engineer/manager)</td>
<td></td>
</tr>
<tr>
<td>Local Chinese suppliers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local Chinese customers/distributors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local Chinese collaborators</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other type of resource transfer, please specify: and the degree of transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Appendix 4 Pre-test for assumption, reliability and validity

4.1 Test of Normality

Tests of Normality

<table>
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<tr>
<th></th>
<th>Kolmogorov-Smirnov</th>
<th>Shapiro-Wilk</th>
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<td>Statistic</td>
<td>df</td>
</tr>
<tr>
<td>Localbuy</td>
<td>.078</td>
<td>63</td>
</tr>
<tr>
<td>Localsale</td>
<td>.049</td>
<td>63</td>
</tr>
</tbody>
</table>

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

4.2 Test of Common Method Variance by Harmon's single factor analysis with confirmatory factor analysis

Total Variance Explained

<table>
<thead>
<tr>
<th>Factor</th>
<th>Initial Eigenvalues</th>
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<td>Total</td>
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<td>3.946</td>
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<tr>
<td>2</td>
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<tr>
<td>3</td>
<td>1.695</td>
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<tr>
<td>4</td>
<td>1.447</td>
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<tr>
<td>5</td>
<td>1.243</td>
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<tr>
<td>6</td>
<td>1.217</td>
</tr>
<tr>
<td>7</td>
<td>1.108</td>
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<tr>
<td>8</td>
<td>1.071</td>
</tr>
<tr>
<td>9</td>
<td>1.058</td>
</tr>
<tr>
<td>10</td>
<td>.975</td>
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<tr>
<td>11</td>
<td>.654</td>
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<tr>
<td>12</td>
<td>.477</td>
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<tr>
<td>13</td>
<td>.386</td>
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<tr>
<td>14</td>
<td>.242</td>
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<td>15</td>
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<tr>
<td>16</td>
<td>.109</td>
</tr>
<tr>
<td>17</td>
<td>.081</td>
</tr>
<tr>
<td>18</td>
<td>.073</td>
</tr>
<tr>
<td>19</td>
<td>.054</td>
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</tbody>
</table>

Extraction Method: Principal Axis Factoring.
Appendix 5 Regression estimations for the influential factors on local orientation, local collaboration and resource transfer

Model 5.1 Influential factors on local orientation of sourcing (local sourcing extent)

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
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<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
<td>Tolerance</td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>.180</td>
<td>.074</td>
<td>2.420</td>
<td>.019</td>
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<tr>
<td></td>
<td>Western-Japan</td>
<td>.031</td>
<td>.014</td>
<td>.154</td>
<td>2.143</td>
</tr>
<tr>
<td></td>
<td>Asian-Japan</td>
<td>-.010</td>
<td>.013</td>
<td>-.044</td>
<td>-.753</td>
</tr>
<tr>
<td></td>
<td>Yangtzei-Bohai</td>
<td>-.018</td>
<td>.013</td>
<td>-.093</td>
<td>-.1441</td>
</tr>
<tr>
<td></td>
<td>Pearl-Bohai</td>
<td>-.026</td>
<td>.016</td>
<td>-.124</td>
<td>-.1608</td>
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<tr>
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<td>Entrymode</td>
<td>.045</td>
<td>.013</td>
<td>.229</td>
<td>3.569</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>.001</td>
<td>.002</td>
<td>.049</td>
<td>.727</td>
</tr>
<tr>
<td></td>
<td>Cluster</td>
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<td>.010</td>
<td>.246</td>
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<td>.010</td>
<td>.197</td>
<td>3.094</td>
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<tr>
<td></td>
<td>Cost</td>
<td>.037</td>
<td>.010</td>
<td>.310</td>
<td>3.652</td>
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<tr>
<td></td>
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<td>.000</td>
<td>.010</td>
<td>-.006</td>
<td>-.091</td>
</tr>
<tr>
<td></td>
<td>Gprogram</td>
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<td>.013</td>
<td>.180</td>
<td>2.558</td>
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Model 5.2 Influential factors on local orientation of sale (local sale extent)

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>.458</td>
<td>.125</td>
<td>3.681</td>
</tr>
<tr>
<td></td>
<td>Western-Japan</td>
<td>.016</td>
<td>.024</td>
<td>.066</td>
</tr>
<tr>
<td></td>
<td>Asian-Japan</td>
<td>.000</td>
<td>.021</td>
<td>-.002</td>
</tr>
<tr>
<td></td>
<td>Yangtzei-Bohai</td>
<td>-.087</td>
<td>.022</td>
<td>-.262</td>
</tr>
<tr>
<td></td>
<td>Pearl-Bohai</td>
<td>-.091</td>
<td>.028</td>
<td>-.361</td>
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<td>.021</td>
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<td>Cluster</td>
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<td>StrategicR</td>
<td>.014</td>
<td>.017</td>
<td>.083</td>
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<tr>
<td></td>
<td>Cregualtion</td>
<td>.003</td>
<td>.017</td>
<td>.014</td>
</tr>
<tr>
<td></td>
<td>Cost</td>
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<td>.017</td>
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<td>Fincentive</td>
<td>.019</td>
<td>.016</td>
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</tr>
<tr>
<td></td>
<td>Gprogram</td>
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<td>.104</td>
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</table>

a. Dependent Variable: Localbuy

b. Dependent Variable: Localsale
Model 5.3 Influential factors on local collaboration intensity

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>Std. Error</th>
<th>Wald</th>
<th>df</th>
<th>Sig</th>
<th>95% Confidence Interval</th>
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</thead>
<tbody>
<tr>
<td>Threshold</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
</tr>
<tr>
<td>Localcoop = 1</td>
<td>11.922</td>
<td>5.658</td>
<td>4.441</td>
<td>1</td>
<td>0.035</td>
<td>0.833</td>
</tr>
<tr>
<td>Localcoop = 2</td>
<td>20.304</td>
<td>8.656</td>
<td>9.564</td>
<td>1</td>
<td>0.002</td>
<td>7.436</td>
</tr>
<tr>
<td>Localcoop = 3</td>
<td>27.009</td>
<td>8.403</td>
<td>10.332</td>
<td>1</td>
<td>0.001</td>
<td>10.540</td>
</tr>
</tbody>
</table>

Location | Age | Cluster | StrategicR | Cregualtion | Cost | Fincentive | Gprogram | [Location=1] | [Location=2] | [Location=3] | [CoO=1] | [CoO=2] | [CoO=3] | [Entrymode=0] | [Entrymode=1] |
<table>
<thead>
<tr>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4.70</td>
<td>2.675</td>
<td>2.177</td>
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<td>-3.54</td>
<td>0.080</td>
<td>0.803</td>
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<td>-1.56</td>
<td>0</td>
<td>-2.443</td>
<td>-1.832</td>
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<td>-1.029</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(1.94)</td>
<td>(1.028)</td>
<td>(1.057)</td>
<td>(0.923)</td>
<td>(0.863)</td>
<td>(0.790)</td>
<td>(1.021)</td>
<td>(1.102)</td>
<td>(1.400)</td>
<td>(0)</td>
<td>(1.375)</td>
<td>(1.378)</td>
<td>(0)</td>
<td>(1.052)</td>
<td>(0)</td>
</tr>
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<td></td>
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</tr>
</tbody>
</table>

Link function: Logit.

a. This parameter is set to zero because it is redundant.

Model 5.4 Influential factors on the degree of backward transfer

<table>
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<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>Std. Error</th>
<th>Wald</th>
<th>df</th>
<th>Sig</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threshold</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
</tr>
<tr>
<td>[Sutransfer = 1.0]</td>
<td>-3.406</td>
<td>3.812</td>
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<td>[Sutransfer = 1.3]</td>
<td>4.439</td>
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<td>1.312</td>
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<td>[Sutransfer = 1.6]</td>
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<td>4.736</td>
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<td>[Sutransfer = 2.0]</td>
<td>12.703</td>
<td>4.541</td>
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<td>0.005</td>
<td>3.003</td>
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</table>

Location | Age | Cluster | StrategicR | Cregualtion | Cost | Fincentive | Gprogram | [Location=1] | [Location=2] | [Location=3] | [CoO=1] | [CoO=2] | [CoO=3] | [Entrymode=0] | [Entrymode=1] |
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<th></th>
</tr>
</thead>
<tbody>
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<td></td>
<td>-1.24</td>
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<tr>
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<td>(0.770)</td>
<td>(0.717)</td>
<td>(0.728)</td>
<td>(0.647)</td>
<td>(0.709)</td>
<td>(0.877)</td>
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Link function: Logit.

a. This parameter is set to zero because it is redundant.

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### Model 5.5 Influential factors on the degree of forward transfer

#### Parameter Estimates

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>Std. Error</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>95% Confidence Interval</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
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<tbody>
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<td><strong>Threshold</strong></td>
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<td></td>
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<td></td>
<td></td>
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<td>.791</td>
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<td>.383</td>
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<td>1.274</td>
<td></td>
</tr>
<tr>
<td>[CoO=3]</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Link function: Logit.

a. This parameter is set to zero because it is redundant.
Appendix 6 Regression results: impact of local orientation on intensity of local collaboration and degree of resource transfer

### Model 6.1 The impact of local orientation on local collaboration intensity

<table>
<thead>
<tr>
<th>Parameter Estimates</th>
<th>Estimate</th>
<th>Std. Error</th>
<th>Wald</th>
<th>df</th>
<th>Sig</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
</tr>
<tr>
<td><strong>Threshold</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LocalcoopR = 1</td>
<td>13.631</td>
<td>2.735</td>
<td>25.584</td>
<td>1</td>
<td>.000</td>
<td>8.472</td>
</tr>
<tr>
<td>LocalcoopR = 2</td>
<td>17.985</td>
<td>3.209</td>
<td>31.419</td>
<td>1</td>
<td>.000</td>
<td>11.686</td>
</tr>
<tr>
<td>LocalcoopR = 3</td>
<td>20.772</td>
<td>3.566</td>
<td>33.923</td>
<td>1</td>
<td>.000</td>
<td>13.782</td>
</tr>
<tr>
<td>Location Localbuy</td>
<td>17.018</td>
<td>4.518</td>
<td>14.189</td>
<td>1</td>
<td>.000</td>
<td>8.163</td>
</tr>
<tr>
<td>Location Localsale</td>
<td>8.733</td>
<td>3.357</td>
<td>6.787</td>
<td>1</td>
<td>.009</td>
<td>2.153</td>
</tr>
</tbody>
</table>

Link function: Logit.

### Model 6.2 Impact of local orientation on degree of backward transfer

<table>
<thead>
<tr>
<th>Parameter Estimates</th>
<th>Estimate</th>
<th>Std. Error</th>
<th>Wald</th>
<th>df</th>
<th>Sig</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
</tr>
<tr>
<td><strong>Threshold</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtransfer = 1.0</td>
<td>2.729</td>
<td>1.540</td>
<td>3.143</td>
<td>1</td>
<td>.076</td>
<td>-.288</td>
</tr>
<tr>
<td>Subtransfer = 1.3</td>
<td>5.194</td>
<td>1.599</td>
<td>10.551</td>
<td>1</td>
<td>.001</td>
<td>2.060</td>
</tr>
<tr>
<td>Subtransfer = 1.6</td>
<td>7.441</td>
<td>1.746</td>
<td>18.153</td>
<td>1</td>
<td>.000</td>
<td>4.018</td>
</tr>
<tr>
<td>Subtransfer = 2.0</td>
<td>9.533</td>
<td>1.819</td>
<td>22.002</td>
<td>1</td>
<td>.000</td>
<td>4.987</td>
</tr>
<tr>
<td>Location Localbuy</td>
<td>9.496</td>
<td>3.501</td>
<td>7.356</td>
<td>1</td>
<td>.007</td>
<td>2.634</td>
</tr>
<tr>
<td>Location Localsale</td>
<td>328</td>
<td>2.785</td>
<td>.014</td>
<td>1</td>
<td>.908</td>
<td>-6.129</td>
</tr>
</tbody>
</table>

Link function: Logit.

### Model 6.3 Impact of local orientation on degree of forward transfer

<table>
<thead>
<tr>
<th>Parameter Estimates</th>
<th>Estimate</th>
<th>Std. Error</th>
<th>Wald</th>
<th>df</th>
<th>Sig</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
</tr>
<tr>
<td><strong>Threshold</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cutransfer = 1.6</td>
<td>3.125</td>
<td>1.506</td>
<td>4.289</td>
<td>1</td>
<td>.038</td>
<td>.166</td>
</tr>
<tr>
<td>Cutransfer = 2.0</td>
<td>5.318</td>
<td>1.606</td>
<td>10.965</td>
<td>1</td>
<td>.001</td>
<td>2.170</td>
</tr>
<tr>
<td>Cutransfer = 2.3</td>
<td>7.154</td>
<td>1.718</td>
<td>17.389</td>
<td>1</td>
<td>.000</td>
<td>3.791</td>
</tr>
<tr>
<td>Location Localsale</td>
<td>5.285</td>
<td>2.847</td>
<td>3.420</td>
<td>1</td>
<td>.064</td>
<td>-316</td>
</tr>
</tbody>
</table>

Link function: Logit.
Appendix 7 Scatter plots of local orientation, marked by local collaboration intensity, degree of backward and forward transfer
Degree of backward resource transfer

- 1.0
- 2.0
- 1.3
- 2.3
- 1.6

Degree of forward resource transfer

- 1.6
- 2.0
- 2.3
- 2.6

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