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Multinational Investment Projects in the Petrochemical Industry in China[♦]

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Abstract

Purpose - The paper discusses the new concept of ‘Multinational Investment Projects’ (MIPs) and its application in the context of international business operations in China. The petrochemical industry in China is used as the industrial context in which we investigate the interplay between the Chinese government, which encourages growth and investment activities in the sector, and the multinational petrochemical firms competing for global market share in this sector.

Design/methodology/approach - We investigate the nature of the petrochemical value chain and the investment activities in all of its segments. Using an originally created database of the top 180 multinational investment projects in the petrochemical industry in China and additional context information the business environment in China, we review the investment strategies of multinational petrochemical corporations, and discuss their strategic choices for mode of entry in China, geographic location, and location within the value chain.

Findings - The overview of multinational investment projects in the Chinese Petrochemical industry confirms the theoretical expectations of the critical impact of Chinese Government policies. We explain the emerging shape of international competition in this sector of the Chinese economy.

Originality/value - The main contributions of this paper are the new conceptual framework for analysis of the drivers for strategic investment choices, the assembly of a database with the top 180 multinational investment projects in the petrochemical industry in China, and the analysis of the relationships between the regional endowments, concentration of value-chain activities and location choices by multinational firms from different countries of origin. Our results demonstrate the factors that drive growth in a knowledge-intensive, technology and capital intensive sector.

Key words: Multinational Investment Projects, China, Petrochemical Industry, Value Chain, Location advantages

1. Introduction

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 increased level of participation from multinational enterprises (MNEs).

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These liberalization policies are creating a business climate and business conditions that are conducive to the establishment and operations of multinational investment projects (MIPs), whereby multinational firms engage in investment activities in partnership with Chinese or other foreign firms.

This paper examines the strategies adopted by MNEs in the petrochemical sector to form MIPs, against the background of the global competition and the domestic business environment in China. We exploit the theoretical argument of specific environment–strategy–performance (E-S-P) relationship, and attempt to analyze the fit between MNEs’ strategies and the dynamic environmental conditions. The fit between strategy and the business environment is theorised as their mutual determination, where strategic choices mount to environmental conditions in a self-reinforcing relationship. This paper focuses on the MIPs in the petrochemical industry, which are established by MNEs in China with or without Chinese partners, and the impact of the business environment on the MNE strategic choices. Under strategic choices we investigate the choices of: geographic location, scope within the value chain, and mode of entry.

We exploit the information available from a business directory on foreign direct investment (FDI) in China containing data on 180 major MIPs in the petrochemical sector. We review the literature that establishes the theoretical foundations for analysis of MIPs and develop a new multi-theoretical framework for investigation of the conditions affecting MNE strategies. We consider multiple factors that contribute to the uncertainty of environment affecting strategic choices during the MIP life cycle, including factors from the domestic and the global multi-partner and multi-cultural environment.

2. The Nature of a Multinational Investment Project (MIP)

The petrochemical industry is an industry that requires multi-sector and multi-partner capabilities, which are assembled on a project basis. MNE investment in the petrochemicals is usually initiated by a project feasibility study, leading to the subsequent establishment of a legal entity in order to implement the project. Projects are *temporary administrative structures designed to achieve specific goals, and which result from the search for horizontal cooperation in organizations* (see also Harold, 2003). Complex projects may include both horizontal and vertical cooperation and coordination of activities (Keegan and Turner, 2001), and may span across multiple organisations.

Projects can exhibit multiple forms, as they face different contexts and may aim at several kinds of goals. Projects result from various forms of cooperation between companies such as strategic alliances, partnerships, joint-ventures, or consortiums with other organizations that support the collaborative strategic efforts of the members (Hamel, Doz, & Prahalad, 1989). Within these alliances and partnerships individual organisations pursue independent strategic aims, as well as shared goals. Often collisions of interests has to be resolved with political negotiations and trade-offs. As a result, project constellations remain fragile formations driven by contract liabilities and agreements where ownership and control do not bring directly competitive advantage.

A project structure encompasses heterogeneous entities, or different types of individuals, organizations and institutional participants, who are co-located within a cooperation field (Todeva and Knoke, 2002) and experience mutual influence (Grabher, 2002). MIPs are established by one or more parties from different nationalities who contribute resources towards the business venture, where there is a link between domestic and foreign business operations. Examples of such MIPs are various turnkey contracts (Young, 1989), cross-border infrastructure projects, and collaborative explorations. MIPs are contract-based establishments that may or may not include ownership clauses. Hence, there could be equity and non-equity element of the complex agreement.

In the literature contracts and the market are considered to be effective governance mechanisms for discrete transactions (Powell, 1990; Ring and Van de Ven, 1992). On the other hand, hierarchical organizational forms are primarily associated with the production of wealth and the rationing of resources under unitary control (Zairi, 1999). A collaborative relationship such as an MIP is conducted as a long-term business relationship that includes repetitive transactions which are neither sanctioned by a market, nor monitored by a hierarchy mechanism. Relationship costs in MIPs can emerge out of opportunistic behaviour of individual partners, or failure to negotiate a common approach within the partnership.

MIPs are governed by negotiations and agreements which are alternative to the price mechanism (Hardy and Phillips, 1998). It is believed that collaborative relationships are better fitted to the local institutional conditions in China, rather than the capitalist market relationships (Phillips and Jeffery, 2000). Richardson (1996) describes such relationships as pre-planned repetitive trading relationships that facilitate production and accomplishment of final outcomes. Such collaborations involve specific grouping of activities and co-specialisation of individual organizational partners.

Collaboration within MIPs can take place under different leadership. In case of a single MNE leading the investment activities in a specific segment of the Chinese petrochemical industry, the project is hosted by the MNE's subsidiary in China. When the project involves a joint venture established with a Chinese partner-firm, the coordination and integration of project activities takes place within the joint venture. In cases of multi-agent leadership by two or more MNEs, the project control and coordination is distributed between different MNEs from different countries, with limited or extended involvement of Chinese firms and authorities. Multi-agent MIPs are complex business networks that involve a multitude of shared resources, knowledge, and coordination of operations crossing the ownership boundaries of individual corporate entities (Todeva, 2006).

The effectiveness of such partnerships is attributed mainly to the division of labour, the specialisation of resources and capabilities, the co-alignment of aims, and the sharing of risks and liabilities. All these mechanisms require long-term optimisation of co-ordination and control that ultimately increases the interdependencies between partners (Todeva, 2006). The agency costs in MIPs multiply by the multi-agent structure of these projects,

and can not be easily offset by ultimate control (Jensen and Meckling, 1976). Optimisation of control is also required for the co-alignment of interests by the partners.

The multi-cultural aspect of MIPs only exacerbates the complexity of collaboration that is already induced from technological and capital requirements of the multi-agent configuration. Most of the literature on joint ventures supports the cultural argument that JV activities depend on the country of origin (CoO) of the MNE. The motives for a joint venture are known to be different between the foreign and the domestic partners, which is expected to put more pressure on the coordination capabilities of individual partners.

MIPs in the high value added segments of technology-intensive and capital-intensive industries seek to protect their knowledge base from spill-overs through optimization of management. The competitive advantage of their outputs is mainly embodied in scientific and technological applications, which partners try to protect from leakage and uncontrolled transfer of know-how. Hence, knowledge agreements are often part of MIPs.

The relationships with the Chinese government and with state owned enterprises (SOEs) also add a further layer of complexity to the management of MIPs. This affects the configuration of the MIPs, their contractual commitments, and their operation licenses. The domestic business environment in China is very much structured by various policy initiatives of the Chinese government that shape the incentives of market players throughout the entire value chain of the petrochemical industry. Both input and output markets of MIPs in this sector are externally influenced through policy initiatives.

Before we discuss the complexity of this environment that influences the strategic choices of MIPs we develop an overview of the petrochemical sector, its value chain, and relationships with other sectors of the economy, and the presence of foreign competition in each segment.

3. The Value Chain of the Petrochemical Industry and Its Impact on MIP Strategies in China

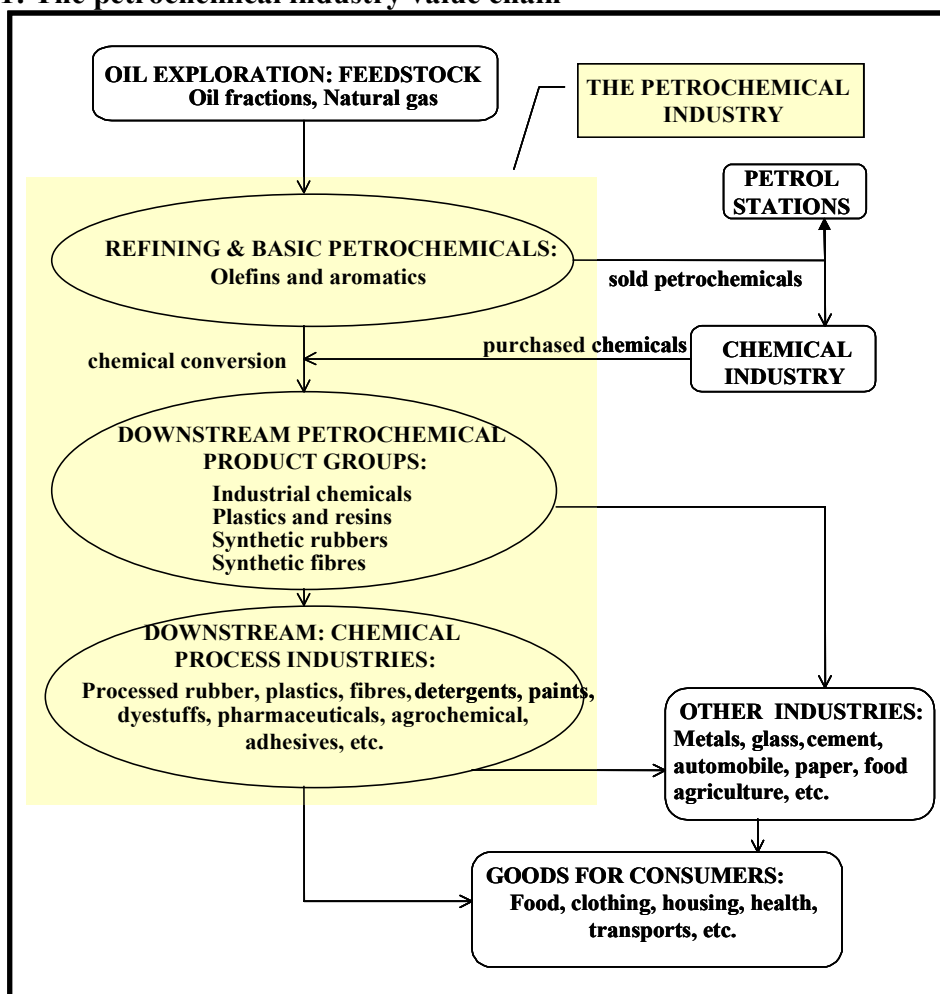
The value chain of the petrochemical industry explains to a great extent the strong government interest in its development. This is a key industry supplying a wide range of industrial products to the rest of the economy - from crude oil, to synthetic products and consumer goods (Fig. 1). It is a capital-intensive industry using complex type of processing technologies. The world's largest multinational petrochemical companies have begun their investment operations in China since the 1990s and have shown a tendency for accelerating investment commitments, increasing market power, and broadening their investment range. Multinational firms own advanced know-how and cutting-edge technology, specially, in certain areas of fine chemicals, functional chemicals, and specialty industrial chemicals.

The petrochemical industry embraces numerous activities with highly complex relationships. 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 1 represents the core value chain of the petrochemical industry (shaded on the diagram) and its connectivity to other industrial sectors.

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 fibers and synthetic rubbers, accounts for more than three-quarters of the total investment output (Lu and Todeva, 2000).

Figure 1: The petrochemical industry value chain

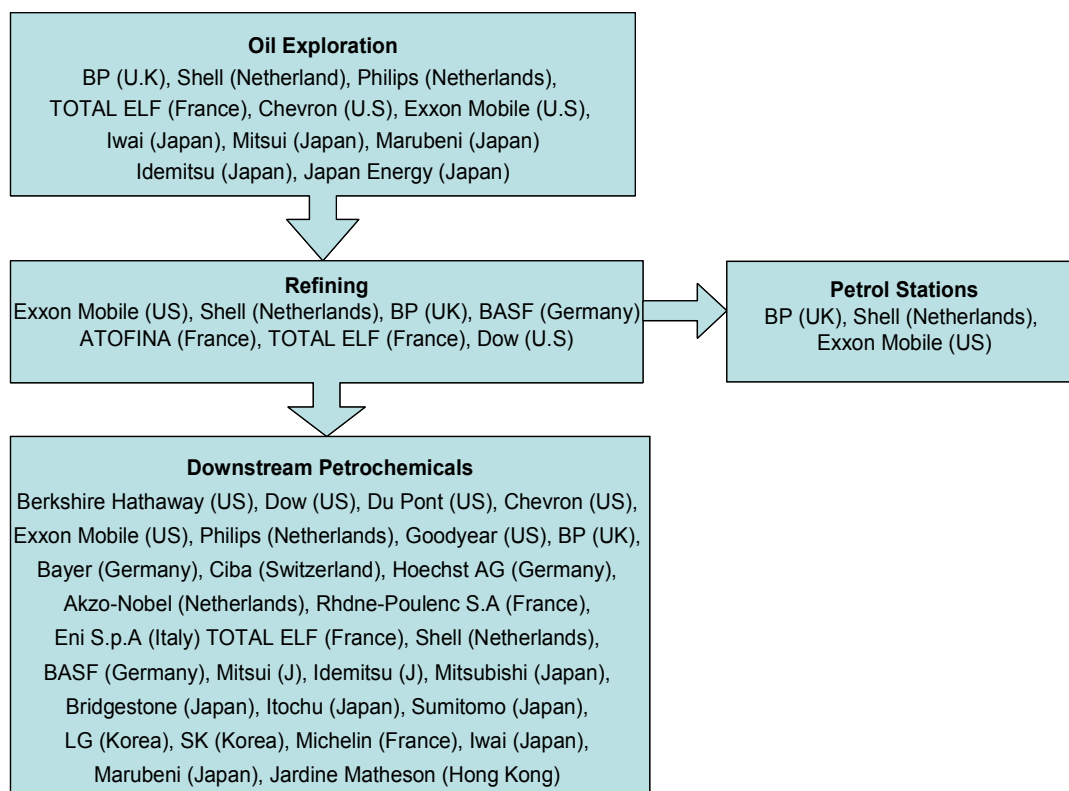


Source: Lu and Todeva, 2000

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 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, fibers, dyers and adhesives, agrochemicals and pharmaceuticals (Fig. 1). 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 in the previously in-company operations of the Chinese Conglomerates of Sinopec (China Petroleum and Chemical Corporation), CNPC (China National Petroleum Corporation) and CNOOC (China National Offshore Oil Corporation).

Figure 2: Distribution of MIPs in sub-segments of the petrochemical industry in China



All top 100 petrochemical MNEs from Europe, US, Japan and Korea have invested in China and their investments spread across all segments of the industry. Data on the location, country of origin of the lead MNEs, ownership structure and industry segment for each project was collected for a selection of the top 180 MIPs in the petrochemical industry. This data is extracted from the ‘Reference Document for Foreign Investment in Petrochemical

Industry' by Shanghai Foreign Investment Commission (www.investment.gov.cn/file0/13.pdf) and the online Chinese national information centre (<http://www.ceie.com.cn/>). The lead MNEs in our selection are all listed in 'Fortune 500'. Figure 2 shows the distribution of these MNEs' operations within the petrochemicals value chain in China.

Most investments in the petrochemical industry are typically in the higher value-added segments of chemicals, oil refining, processing refined oil, oil distribution, and petrol stations. Foreign companies in China are not only involved in production of final output from upstream to downstream, but also include 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 (see figure 2 and table 1). 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.

The composition of partners in individual MIPs is also an evidence of successful government strategies to attract FDI and to spread the capabilities of these foreign investors across the entire value chain. Our database with the top 180 largest MIPs in the petrochemical industry in China provides a good foundation for the assessment of the factors that influence and the outcomes from the strategic choices of these large project operations. The next section of the paper discusses the theoretical foundations that explain these influences.

4. Antecedents to MIP Strategic Choices

International business research has continued to broaden the scope of the field and to address different aspects of FDI and foreign market operations, including: entry modes (Kogut and Singh, 1988), forms of ownership (Gomes-Casseres, 1990), and the location of operations in sites within a host country (Swamidass, 1990). A stream of work has studied the wide variety of conditions influencing FDI decisions, including home market and host market conditions. Among such factors are resource endowments for particular locations, market opportunities, efficiency and cost-related factors, and access to strategic assets such as knowledge and technology. Dunning (2009) contrasts these factors in a typology of motives for location of FDI: a) resource seeking; b) market seeking; c) efficiency seeking; and d) strategic asset seeking.

While this existing research represents the broad context for our study, none of the theories can serve as immediate foundations for investigating the antecedents to MIP strategic choices. The main reason for that is the dominant assumption in the literature that international business operations are driven primarily by corporations that exercise a unitary form of decision making and control. Although the literature on strategic alliances

and joint ventures makes a major contribution in the discussion on collaborative strategies and co-alignment of interests, the theoretical and empirical foundations for such research are lacking integration with major strategic management concepts such as: the value chain, economies of scope, environmental fit, and collaborative advantage. In addition, the international business literature is still dominated by transaction cost economics, and greatly ignores the institutional factors and processes that shape the business environment in host and home countries. The present study seeks to fill this gap in existing theory and to investigate the complexity of factors that affect the formation of MIPs, including characteristics of the institutional and technological environment specific to the petrochemical industry and specific to the Chinese political context that shapes strategic decisions of MIP partners.

This paper attempts at a synthesis of several approaches that underpin a theoretical investigation of the driving forces behind MIPs. The early work of Bain (1959) on industrial organization, found that structural conditions determine the behaviour and subsequent firm's performance. According to the structure-conduct-performance (SCP) framework (Scherer, 1996), industry structure influences firms' conduct which in turn impacts both on the industry structure and the performance of individual firms. Industry structure affects firm choices via a number of mechanisms such as barriers to entry, concentration of market power, and the level of competition. Contingency theory also emphasizes the impact of environmental conditions, and promotes the idea that organizations should design their strategies to fit the environment (Lawrence and Lorsch, 1967; Donaldson, 2001). The notion of strategic alignment has emerged in many empirical studies in the organization literature, which fundamental proposition is that organizational performance is the consequence of the fit between two or more factors such as strategy, structure, technology, culture, and environment (Burns and Stalker, 1961).

Being a multi-agent agglomeration, an MIP with shared control represents a common strategy, negotiated and adopted by the agents that co-align to multiple industrial and country environments. Such co-alignment includes the home market of the MNE, the host market environment in China, and the global business environment.

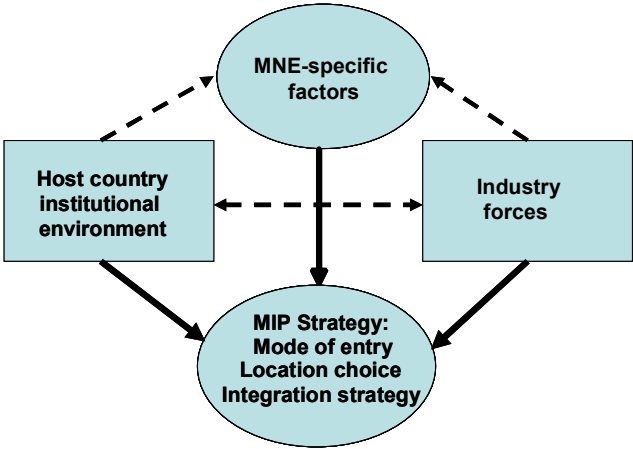
With respect to the MNE, John Dunning's OLI (1993) (ownership, location and internalisation) framework is used to analyse the effect of firm-specific, industry-specific and host country factors on MNEs' strategic choices. This framework, however, treats the multinational firm as a uniform strategic agent, rather than as a business network of agents co-aligned to common strategic aims. The resource-based-view of the firms (RBV) on the other hand puts more emphasis on the internal resource structure (Barney, 1991), and regards organizational resources, skills and competencies as having a greater impact on firm's strategies. In the international management and strategy literature, firm and industry heterogeneity are discussed in the context of factors such as subsidiary-specific variables (the nationality of the parent, the age of the operation, the embeddedness of the MNE in the host market, or the size of the subsidiary and its impact on the host market).

The link between strategic choices and competitive advantage of the MNE remains an assumption in the strategic management literature that focuses primarily on bundling internal capabilities and ignores collaborative advantage that derives from partnerships, or the impact of externalities such as co-location of firms, government policies and institutional practices. Overall, the conceptualisation of the environment into political, economic, social, and technological (Porter, 1980) does not facilitate more critical evaluation of the institutional impact and the role of government policy. The distinction between domestic and foreign business environment and the generic reference to the global business environment also serves as a barrier to recognising its full impact through multinational and multilateral business interactions. The MIP concept embraces the complexity of the internal structuring of resources and external leveraging of capabilities. The political sensitivity around the growth of the Chinese petrochemical sector requires a full recognition of the interaction between Chinese and foreign partners, and the impact of local and global competition and the host government and foreign corporate policies and strategies on this interaction.

The complexity of the global environment for petrochemical products is more than the combined environments in China and in various domestic markets, where the multinational firms originate from. Therefore, a fundamental challenge to analysis of MIPs is the level of alignment in strategic coordination, given the influence from different economic and regulatory environments on the partners. Strategic coordination in a multi-agent project network will be affected by the constraints and opportunities from the environment in their domestic market, as well as from other countries of operation (Todeva, 2006), and the host environment in China.

MIP strategic choices are affected also by the firm attributes of all members of the MIP network, and in particular – the lead MNE. The strategic choices, however, of the MIP partners are moderated by the environmental conditions and the industrial competitive forces within individual segments of the petrochemical value chain (Fig. 3).

Figure 3: Antecedents to MIP Strategic Choices



Industry competitive forces in terms of Porter five forces' determine potential profitability in an industry and provide the basis for effective strategy formulation to sustain above average return on investment, or to control competitive advantage (Porter, 1980). These industry forces, commonly used in strategic analysis, are barriers to new market entry, substitutes, bargaining power of buyers and suppliers, and the nature of competition in an industry segment. These however, assume lack of institutional interventions such as pricing policies and investment priorities set by the government.

As a result of synthesis of this broad literature, we have identified 3 groups of factors that affect strategic choices at the level of MIPs (Fig. 3). These are: MNE specific factors (which we capture with the concept of 'country of origin'; the host country institutional environment (which we investigate through Chinese government policies that induce constraints and opportunities for foreign investors in the petrochemical industry); and the industry forces (or the specific technology / capital / resource intensity and the market risk of individual segments of the petrochemical value chain).

Impact of MNE factors

The main attributes of the MNEs that contribute to their MIP strategies are: country of origin, scale and scope of global operations, technological capabilities within the industry value chain, collaborative experience, and experience within the Chinese market. MNEs in the global petrochemical industry have different scope of operations determined to a great extent by their access to oil-extraction facilities, their technological integration with refining operations, their industrial links to the chemical industry, capabilities in various downstream process technologies, and established distribution facilities. Many of these characteristics are strongly influenced by their country of origin, their history and international experience. The diversification within the petrochemical industry and across other related industries is very much shaped by strategic choices of the MNE which are path-dependent from their establishment.

These characteristics are strong determinants for the type of wholly owned subsidiaries (Roth and Morrison, 1992; Taggart, 1997). In cases of collaborative ventures such as MIPs, selecting MIP ownership structure depends on many factors, including: industry segment, the project initiators and their financial and technological capabilities, the business environment in the host region, including tax incentives and other regulatory factors, and the priorities set by the Chinese government. In global industries such as the petrochemical industry, a foreign firm may seek alliance either with a local partner, or with another foreign firm in order to share country risks (Pan and Tse, 1996). Following from this, the ownership structure of the MIP could vary by the number of participants - from only one MNE, or several firms from Chinese or foreign origin.

Impact of Institutional factors

The institutional environment in a host economy is one of the critical elements of the business environment of an MNE. The local institutions provide incentives, constraints and business support infrastructure enhancing performance (Lewin et al., 1999; Lewin and Koza, 2001). Government regulations have been consistently discussed as part of the firm's

environment (Thompson, 1967; Kohli and Jaworski, 1990). MNEs entering emerging economies have to consider upfront the specific regulatory environment in the host economy. MNE decisions are also moderated at multiple stages by political negotiations with host governments that have indirect impact on future performance. MNEs are likely to confront a significant level of complex government decisions. Such institutional factors trigger multiple efforts towards co-alignment of interests between domestic and foreign actors, including the host government and the foreign multinational. The multi-agent structure of an MIP requires co-alignment of multiple interests, capabilities and strategic orientation of individual MIP member organisations.

The institutional environment in a host country determines significantly the way MNEs engage in investment activities, and how local firms respond to foreign competition. Government regulations are introduced to protect domestic companies' assets and to encourage new infusions of capital, technology and management know-how into the economy. Although China is undergoing a transition of the economic system from a centrally planned economy towards a market-oriented one, the government influence is still overwhelming particularly in the petrochemical sector (Child and Tse, 2001). Provided that China includes vast territories and a number of regions with specific regional policies designed to attract FDI, we would expect that different regions would attract different concentration of MIPs.

In a centrally planned economy in transition, institutional forces are generally stronger and more complex than in a free-market economy (Peng and Heath, 1996). As a consequence, foreign enterprises are particularly constrained by cognitive and socio-political pressures, and hence cannot freely make strategic choices. These institutional constraints are raised by governments for the purpose of efficiency (Roberts and Greenwood, 1997) and control over the market power of dominant firms. Hence, we expect that institutional factors will play predominant role in distribution of investment activities in China.

Our focus is limited to the institutional environment of a host country that comprises of foreign policy, laws, and regulations, affecting incentives, costs, and operations of the MIP. Previous studies of the impact of institutional factors on entry modes cover issues related to political hazards (Delios and Henisz, 2000), legal restrictions on foreign ownership (Delios and Beamish, 1999; Yiu and Makino, 2002) and host-country risks in general (Brouthers et al., 2004). Entry barriers are considered to originate from political and social constraints, and are regarded as factors that induce inter-firm cooperation (Hitt, et al, 2004).

The impact of institutional factors is explained with the organisational ecology argument. In order to cope with isomorphic pressures, to attain legitimacy and to increase the opportunity for survival, an organization must adjust its structures and processes (Meyer and Rowan, 1977; DiMaggio and Powell, 1983). Example of such isomorphic behaviour is the acceptance by MNEs to engage in joint ventures in capital intensive and technology intensive sectors as a second best option with high risk, coordination costs and interdependence on Chinese government decisions. A moderating factor in this process is

the liberalisation that took place in China as part of its transition to WTO membership, which served as an incentive to MNEs.

Before 2007 and the WTO entry, Sinopec was authorized by the Chinese government as the sole oil distributor for China. During this stage, MNEs had to choose a joint venture mode of entry in the oil distribution segment, and to team up with branches of Sinopec, or other Chinese firms. The opening of China's economy from early 2007 allowed more domestic private companies and foreign companies to established independent operations, and in particular, to enter the crude oil distribution market.

With the gradual opening of the domestic market in China, MNEs were progressively allowed to form sole control MIPs. Restrictions that were eliminated in conjunction with the WTO membership have been related to trade and foreign-exchange balance requirements, to local content requirements and export performance requirements, as well as foreign ownership restriction on refining operations. This, liberalisation was conducted with the knowledge that Chinese state-owned companies significantly dominate the crude and oil product markets, where MIPs have relatively small market share. The direct impact of the institutional environment is most visible in relation to the approval criteria and process by which the Chinese government has allowed operations by MNEs.

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 MIPs (Tan, 1997), and to attract more large scale and integrated projects. Such political requirements are becoming a driving force in shaping future MIP strategies and partnerships, and represent a clear form of direct institutional impact.

Impact of Industry forces

The implementation of government policies driven by political and economic objectives has been shaping all sectors of the Chinese economy. The structure of the petrochemical industry is a product of such policies. An industry structure comprises of technical (Gomes-Casseres, 1989) and economic dimensions (Bain, 1972) within which firms compete. Industry structure is expressed by different segments of the value chain, where different MIP strategic choices prevail - both in terms of geographic location, and location within the value chain (or industry scope of operations).

Research in the past has suggested that industry characteristics influence the choice of entry mode for international operations. Greenfield investments are considered as the most appropriate mode of entry for technologically intensive operations because through them companies reduce the chances of dissemination of knowledge and firm-specific advantages (Hennart and Park, 1993). On the other hand, it is argued, that firms would be more likely to establish JVs when they enter into an R&D intensive industry (Kogut and Singh, 1988), and in a growth industry (Hennart, 1991), in order to share R&D costs and risks. Hence,

there are theoretical expectations in both directions. Segments of the value chain with high technology intensity may attract both Greenfield and JV investments.

A number of studies have observed a positive relationship between asset specificity and higher level of ownership (Kim and Hwang, 1992; Erramilli and Rao, 1993), and this is particularly important for the petrochemical industry, which involves a lot of asset-specific investment decisions. Luo (2001) suggests that if the asset specificity of the industry is high, an MNE seeking long-term profitability is likely to choose a sole ownership that facilitates the receipt of sustained financial returns generated from monopolistic or oligopolistic positions. Following from these studies, we may expect that segments of the petrochemical value chain that exhibit high asset specificity, such as refining or other processes, will be associated with modes of entry that involve more equity control.

Most of this literature assumes that the institutional environment is indifferent to choices of foreign market entry. However, in the context of China, the requirements for substantial equity control by the MNE are moderated by the Government requirements for control over the petrochemical sector, and hence, we may expect mixed forms, or equity joint ventures, facilitating shared control.

High industry competition has also been recognized as an influential factor on entry mode choice. As an environmental factor competition induces motives to select an ownership form that allows foreign firms to exercise significant control (Kim & Hwang, 1992; Pan, 1996). This however, may not be realised due to other moderating factors, such as institutional and technological requirements imposed by the host government.

Industry competition is mainly associated with the concentration of firms in individual segments. Subsequently, an industry's concentration level implies the degree of monopoly power that the MNEs could exercise (Luo, 2002). One of the leading arguments suggests that high levels of industry competition lead to the establishment of jointly owned subsidiaries (Hennart and Larimo, 1998), as companies seek to share the risks. Beamish (1985) argues that the degree of competition in a particular industry affects both the configuration and the stability of JVs. As a result, we may expect that segments of the petrochemical industry that are exposed to direct industry competition, will host more joint venture type of investments, which is an ownership form that receives most institutional support by the government as well.

Determinants of geographic location choices and positioning within the value chain

In our theoretical framework by location choices we mean both geographic location, and location or positioning within the value chain. The theories that inform us about determinants of location choices come mainly from the strategic management and the economic geography literature. The emphasis has been mainly on the co-location of firms in geographic regions, and its impact on local labour market and local economic growth (Piore and Sabel, 1984, Doeringer and Terkla, 1995).

The existing international business literature on the choice of location by MNEs has focused either on host country characteristics (location advantages), or on the impact of firm and industry characteristics in the host economy (internalisation advantages gained through strategic asset seeking) (Dunning, 2009). Dunning (1993) explains the rationale for investment location choices, and develops the argument that location advantages can be industry-specific as well as country-specific. The close relationship between agglomeration dynamics in specific geographic regions and the location of FDI has also been acknowledged (Bartlett and Ghoshal 1986; Krugman, 1991; Birkinshaw, 2000).

Firms prefer to enter a region that already has a large pool of workers and other firms, even if they forgo some monopoly power (Amiti and Pissarides, 2005). Among the main regional ‘attractors’ are: regional resource endowments, a pool of educated labour, innovation capabilities and universities, support infrastructure, local and global market reach, presence of other foreign investors, low trade barriers, and other related industry sectors (Goldstein and Gronberg 1984; Amiti and Pissarides 2005). Therefore, it could be expected that industry concentration or competition in a region will attract additional foreign investments to that region. Existing domestic firms and foreign firms in a region may exert different effects on new foreign firms, as they have different access to political resources and different market power. Geographic distribution of foreign firms results also from differences in investors’ preferences which depend on their sector of activity (Markusen and Venables, 1995). MNEs select segments of the value chain as a result of their capabilities, as well as the regional specificities. They may engage in mergers and acquisitions of foreign assets, driven by the gap of their capabilities, therefore seeking to improve their economies of scope.

In summary from the theoretical perspectives discussed above, we have adopted an approach that investigates multiple factors affecting MIP strategies. According to our multi-theoretic framework, described in Fig. 3, the firm’s environment encapsulates the environmental pressures and in particular those stemming from institutional barriers and government policies and decisions. These factors are location specific - for different regions in China, and industry specific – for different segments of the industry value chain. MNE strategies to invest in different locations in China, in different segments of the value chain, and to employ a variety of modes of market entry will be determined both by the specific characteristics of the MNE and the moderating influence of the host institutional and industrial environment, as well as other members of the MIP.

We distinguish between characteristics of the lead MNE and characteristics of the MIP. While the MNE selects mode of entry in the context of its strategic motives, the decision for the MIP formation is very much moderated by the Chinese government. As a result, we treat mode of entry as an outcome of MIP strategies, negotiated between the MNE and the other Chinese and foreign counterparts. Once established, the MIP develops as a business formation and begins to affect its environment through its capabilities and strategic intent.

The MIP characteristics that affect all other strategic choices include: government endorsement, age, size, composition of the partnership, country of origin of each partner,

including their strategic capabilities and the specific characteristics of the lead MNE. These MIP choices further affect the interaction with the environment through co-evolution and mutual adaptation (Todeva, 2007).

We discuss the MIP strategy as an outcome from the characteristics of the lead MNE and other partners, from the influence of the industry structure and the associated with it competition (or industry forces at specific targeted segments of the value chain), and from the host institutional environment in China (Fig. 3). In the context of the petrochemical industry in China, the institutional environment varies in different geographic locations and in different segments of the value chain, due to specific regional and industrial policies.

We discriminate between 4 types of geographic locations – mainland China, liberalised economic zones on the east coast, locations around major metropolitan cities (such as Beijing, Hong Kong and Shanghai), and strategic locations containing major transportation arteries and hubs. For our comparison we have selected 4 regions:

- **The Pearl River Delta** covering Guangzhou and Fujian province - consists of a number of the earliest special economic zones (SEZs) established since 1980, with the major metropolitan and global city of Hong Kong, and the major transportation arteries of Pearl River Delta and Hong Kong International Port, with access to major consumer markets and industries in the area and in mainland China, and access to off-shore oil extraction facilities in the South China see.
- **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 and the Yangtze River Delta as transportation roots to major inland provinces, with an established industrial basis of steel, heavy industry, equipment manufacturing and petrochemicals.
- **Bohai Economic Rim** includes the economic hinterland surrounding Beijing, and the coastal provinces of Tianjin, Hebei and Shandong which surround the Bohai Sea, with numerous SEZs with established heavy industries and manufacturing and access to new off-shore oil extraction facilities in the Bohai Bay area.
- **The Central and Western Regions** includes 5 inland autonomous regions (Guangxi, Inner Mongolia, Ningxia, Tibet and Xinjiang) and 7 neighbouring to them provinces (Chongqing, Gansu, Guizhou, Qinghai, Shaanxi, Sichuan and Yunnan) – enormous pool of labour and consumer market, some tax incentives and preferential policies, but limited industrialisation, scarce natural resources and located at long distance from the eastern coast.

The MIP strategies that emerge under the influence of specific institutional and economic environment in each region and the global competition in the entire petrochemical sector include entry mode for the foreign partner, location choice, and industry scope. All three elements of the MIP strategy are strongly influenced by the lead MNE preferences and capabilities, by the strategic choices of the Chinese government (or what we refer to as the impact of the institutional forces), by the competitive and demand conditions in individual regions and by the specific industry environment in individual segments of the

petrochemical industry, and the risk / technology / capital intensity, or what we refer to as industry forces.

For the investigation of the MIP strategies we compare the number of investment projects in each segment of the value chain and in each selected region. Our underlying assumptions are the following:

- **MNEs** with *specific capabilities (and other characteristics that stem from their country of origin)* will select specific regions and specific segments of the petrochemical value chain; among the MNE-specific characteristics, listed in the literature, are the following:
 - country of origin;
 - size;
 - international experience;
 - production capacity and specific technological capabilities;
 - technological and resource constraints.
- **Regions** with *strong regional endowments* will attract higher concentration of MIPs; among the regional endowments, listed in the literature, are the following:
 - attractive labour market;
 - concentration of factors of production, including proximity to oil extraction facilities;
 - high level of industrialisation and industry demand for petrochemical products, including high level of consumer demand;
 - advanced support infrastructure such as transportation and logistics;
 - existing high agglomeration of domestic and foreign firms;
 - intensive import/export activities demonstrating growth;
 - preferential government policies and special incentives.
- **Segments** of the value chain that exhibit *high capital and technology intensity and high competition* will attract both types of entry modes - joint venture investments (for sharing risk) and wholly owned subsidiaries (for control); among the characteristics of specific industry segments, listed in the literature, are the following:
 - capital intensity and associated with it investment risk;
 - technology intensity and associated with it knowledge spill-over risk;
 - level of local/ global competition and associated with it market risk
 - preferential government policies.

In this context we treat location choices as dependent variables, the institutional and industrial environment in regions as independent variables, and the characteristics of the lead MNE as moderating variables.

5. Analysis of the Outcomes from Strategic Choices by MIPs in the Petrochemical Industry in China

The Chinese large petrochemical producers all operate under the big three integrated enterprises, Sinopec (China Petroleum and Chemical Corporation), CNPC (China National

Petroleum Corporation) and CNOOC (China National Offshore Oil Corporation). These firms remain dominant producers and sellers of petrochemical products in all key markets.

MIPs in China face direct competition both from the local Chinese players and from other global players. For example, the global resin industry has five major players excluding China, but the Chinese resin segment has nearly 100 such companies and MIPs that operate in the domestic market in this segment (Floyd, 2002).

Many Chinese state-owned enterprises (SOEs) are capable of producing high quality and perfectly serviceable products, despite their financial difficulties. As a result, MIPs that involve a merger, an alliance or a joint venture with a Chinese company, gain competitive advantage and establish a strong market position. In some cases, the Chinese partner in a JV continues to operate its older facilities, posing a latent threat to its own JV activities.

U.S, Europe, Japan and Korea are the main investors in the Chinese petrochemical industry that compete with each other as much as they compete with the Chinese ‘big-three’ – Sinopec, CNOOC, and CNPC. Furthermore, home environment and culture distance of these MNEs does impact on the configuration of the MIP investment projects. For instance, U.S. MNEs tend to invest in projects with high technology intensity by themselves, while European MNEs hold more positive attitude towards technology cooperation or a joint venture with a Chinese company. European MNEs engage in market-oriented MIPs, while Japanese and Korean MNEs prefer export-oriented wholly owned subsidiaries and projects (Park and Lee, 2003, Child, 2003). In the rest of this section, we analyse the variation of strategies and these can be explained with the ownership structure of the MIPs. We also investigate the relationships between the host environment, the MNEs, and their location choices (including both geographic location and location within the value chain). We discuss how institutional and industry factors influence these choices.

MIP ownership structure as a strategic choice

The literature on mode of foreign market entry is dominated by the assumption that this is a choice that is made by the MNE, and this choice is affected by both - its internal capabilities, experience and strategic objectives, and the external environmental conditions. The mechanisms, however, remain little explored. The literature also acknowledges that the Chinese government actively interfere with all strategic choices. The section below explains these mechanisms and instruments used by the Chinese government to guide the strategic investment process in the petrochemical industry.

According to the Chinese Ministry of Commerce, the institutional arrangements available for foreign investment projects in the Chinese oil and petrochemical sector are: wholly owned ventures/projects (WOP), equity joint ventures/projects (EJV), and cooperative or contractual joint ventures/projects (CJV). The distribution of MIPs by major MNEs is across all modes of entry (Table 1) and all segments of the petrochemical value chain (Table 1 and Table 2).

Table 1 classifies the top 180 MIPs in a matrix, based on three variables: country of origin (CoO) of the lead MNE, type of ownership and industry segment. In our selection of the largest MIPs we observe a distribution of modes of entry which is dominated by equity joint ventures (54%), followed by WOP (34%), and contractual joint ventures (12%). WOPs cannot be used in every sector, because the government requires Chinese company participation or control in oil refining and distribution. For example, the largest concentration of WOP is in the downstream segment (33%) of the total number of projects (Table 2), of which the Japanese MNEs have secured the largest stake (14%) (Table 1).

Table 1: Ownership structure of the major petrochemical MIPs in China (%= (count / total N of cases/180))

Segment CoO	Type of Ownership	Oil Exploration		Refining		Downstream		Petrol Station		Total	
		Nb	%	Nb	%	Nb	%	Nb	%	Nb	%
US	EJV	0	0%	3	1.7%	17	9.4%	1	0.6%	21	11.7%
	CJV	1	0.6%	2	1.1%	0	0%	0	0%	3	1.7%
	WOP	0	0%	0	0%	19	10.6%	0	0%	19	10.6%
	ALL	1	0.6%	5	2.8%	36	20.0%	1	0.6%	43	24.0%
Europe	EJV	5	2.8%	5	2.8%	22	12.2%	2	1.1%	34	18.9%
	CJV	8	4.4%	1	0.6%	1	0.6%	1	0.6%	11	6.1%
	WOP	3	1.7%	0	0%	11	6.1%	0	0%	14	7.8%
	ALL	16	8.9%	6	3.4%	34	18.9%	3	1.7%	59	32.8%
Japan	EJV	2	1.1%	0	0%	31	17.2%	0	0%	33	18.3%
	CJV	7	3.9%	0	0%	0	0%	0	0%	7	3.9%
	WOP	0	0%	0	0%	25	13.9%	0	0%	25	13.9%
	ALL	9	5.0%	0	0%	56	31.1%	0	0%	65	36.1%
Other (Korea, Singapore Taiwan)	EJV	0	0%	1	0.6%	7	3.9%	0	0%	8	4.4%
	CJV	1	0.6%	0	0%	0	0%	0	0%	1	0.6%
	WOP	0	0%	0	0%	4	2.2%	0	0%	4	2.2%
	ALL	1	0.6%	1	0.6%	11	6.1%	0	0%	13	7.2%
Total		27	15.0%	12	6.7%	137	76.1%	4	2.2%	180	100%

Source: Investment Shanghai (2007).

Note: MIPs are sorted by CoO, the industry segment, and the legal status of MIPs (WOP, EJV, CJV). Percentages are calculated on the basis of our selection of 180 MIPs.

JVs are known to benefit foreign investors as the Chinese partner usually has certain strengths, such as central or local government support, brand reputation, land, licenses, distribution facilities, and access to suppliers. These strategic capabilities of the Chinese partner reduce initial costs and improve the foreign investor's chances of success. This is employed particularly by the European investors whose joint venture activities represent 25% on the total investment activity in the Chinese petrochemical industry, followed by Japan (22%) and US (13%) (Table 1). The variation in ownership has increased along with the development of the reform.

Collaborative MIPs in oil exploration are usually governed by cooperative or contractual development agreement because of their short term, high risk and capital intensive nature. Table 1 indicates that CJV is the most applied type for oil exploration project (17 out of 27 projects). As investments and exchanges tend to be short-term in oil extraction, flexibility is attained through switching partners and negotiating new terms of exchange as appropriate. In addition, most of these operations are off-shore and in territorial waters, where ownership advantages stay with governments. Another advantage of CJVs compared with WOPs is that they generally facilitate intangible and critical political alliances as well as secure access to scarce inputs like crude oil, foreign exchange and expertise. Foreign firms undertaking CJVs in the crude oil segment usually do so with local SOEs or other local governmental authorities.

With regard to oil refining, there are only 12 projects lead by large MNEs from U.S and Europe (including one from Japan), with the dominant form of investment being EJVs and CJVs with SOEs without exception (Table 2). One of the earliest MIPs 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 located in the south coast, involving oil refining and finished oil products. MIPs in the refining segment are still scarce, compared with the number of MIPs in other segments. The Chinese government still places some requirements on MIPs 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 crude oil externally.

Table 2: Type of ownership by industry segment (%=count / total N of cases180)

		Industry Segment									
		Oil Exploration		Refining		Downstream		Petrol Station		Total	
		Count	%	Count	%	Count	%	Count	%	Count	%
Type of Ownership	CJV	17	9.4%	2	1.1%	1	0.6%	1	0.6%	21	11.7%
	EJV	7	3.9%	10	5.6%	77	42.8%	3	1.7%	97	53.9%
	WOP	3	1.7%	0	0.0%	59	32.8%	0	0.0%	62	34.4%
	Total	27	15.0%	12	6.7%	137	76.1%	4	2.2%	180	100%

Source: Investment Shanghai (2007).

Note: All MIPs are classified by the ownership type (CJV= contractual joint venture, EJV=equity joint venture, WOP= wholly owned project) and the industry segment.

The high level of capital intensity for investment in the refining segment is associated with great resource commitment and increases business and political risk for foreign firms (Chen and Hu, 2002), which induces the need by MNEs to seek ownership advantages. Government regulations of this segment, however, have not permitted WOP, which confirms the expectation of strong government impact on the selection of ownership type. In addition, the competitive threat for MIPs from SOEs in oil refining is very high. As a result, spreading the risk through JVs with SOEs has been also a safer choice for the MNEs.

MIPs in downstream petrochemical segment have exhibited a different set of regulatory requirements, and as a result their strategic choices have shifted towards more equity control. Overall 43% of all MIPs are registered as EJV, and another 33% as WOP (Table 2). In terms of production process, the downstream petrochemical sector (and especially fine chemicals) have lower capital intensity but higher technology intensity, higher product diversification, and higher value-added based on product innovations. This segment is less regulated and exhibits fierce competition. Equity control has been preferred by MNEs in this segment in order to protect technology and know-how. Nevertheless, MIPs are established mostly by shared ownership which could be explained by the industry competition and some institutional constraints. At the time of the initial investment 43% of all MIPs are EJVs and 33% are WOPs (Table 2).

MIP in distribution of finished oil products is an emerging investment area 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 foreign petrochemical companies. However, foreign companies entering this segment face intensive competition from established SOEs. In response to this situation, MIPs 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 distribution companies. For example, in 2004, subsidiaries of Shell and BP acquired and formed EJVs type of projects 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 have set up new subsidiaries with Chinese domestic petrochemical giants to construct retail networks for the refined oil products. 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 (<http://www.chinacsr.com/>). The number of MIPs in this segment, however, remains small – only 4 projects in total (Table 2).

Location of MIPs in a geographic area

According to distribution statistic of petrochemical MIPs published by the Chinese Ministry of Commerce, there are four locations in China. These are the Pearl River delta (L1), the Yangtze River regions (L2), around the Bohai Bay and large cities in North China (L3), and central and western provinces (L4). These geographic locations are characterised by a significant diversity in economic development, transport infrastructure, industry

concentration, and government policy. Local conditions are inevitably influenced by the local government policies and are path dependent on historical factors. The intensity of competition is also not uniform at regional and segment level. Location factors such as degree and content of favourable trade policies, or regional investment and industrial policies, vary across types of geographic locations. Locations with stronger government support, higher degree of industry agglomeration, and less institution barriers (such as Yangtze River regions along the east coast) have attracted more MIPs.

Table 3: Location by type of ownership (%=count / total N of cases180)

		Type of Ownership							
		CJV		EJV		WOP		Total	
		Count	%	Count	%	Count	%	Count	%
Location	1	11	6.1%	16	8.9%	11	6.1%	38	21.1%
	2	2	1.1%	52	28.9%	41	22.8%	95	52.8%
	3	5	2.8%	25	13.9%	10	5.6%	40	22.2%
	4	3	1.7%	4	2.2%	0	0.0%	7	3.9%
	Total	21	11.7%	97	53.9%	62	34.4%	180	100%

Source: Investment Shanghai (2007).

Note: All MIPs are classified by the ownership type (EJV, CJV, WOP) and the location (L1= Pearl River delta; L2= Yangtze River regions; L3= Bohai Bay and large cities in North China; L4= Central and Western Regions).

Tables 3 and 4 indicate the variation in location strategies by MIPs in China. The highest concentration of MIPs in the Yangtze River Delta surrounding Shanghai is striking – 53% of all MIPs, compared with 21% in the Pearl River Delta (anchored around Hong Kong). Looking at the profile of the two regions, they are similar in their regional endowments. Both have access to a global city, international air and water transportation facilities, good transportation access to inland China, and a number of SEZs with liberalized regimes.

The major cities in Pearl River delta (L1) were reformed as early as China started the ‘open door policy’, and they have become the most developed economic zones. Pearl River delta is recognized as the FDI preference location for MIPs because of low institutional barriers. The preferential policy to attract foreign investment has promoted the international trade of petrochemical products, which has especially attracted more export-oriented MIPs and those strongly dependant on imported raw material. However, the structure of the regional economy with focus on light manufacturing industries confines the even distribution of

MIPs in different positions of the petrochemical value chain. For example, Guangdong and Fujian provinces in this region are the concentration destination of refining MIPs. This is because they are major consumer market, and have advantages for transporting crude oil and petroleum products to inland areas along the coast. They are also the location of two JV refineries that import crude oil from overseas.

Table 4: Industry segment by country of origin of the lead MNE ($\% = \text{count} / \text{total N of cases} 180$)

		Country of Origin									
		US		EU		Japan		Other		Total	
		Count	%	Count	%	Count	%	Count	%	Count	%
Industry Segment	Oil Exploration	1	0.6%	16	8.9%	9	5.0%	1	0.6%	27	15.0%
	Refining	5	2.8%	6	3.3%	0	0.0%	1	0.6%	12	6.7%
	Downstream	36	20.0%	34	18.9%	56	31.1%	11	6.1%	137	76.1%
	Petrol Station	1	0.6%	3	1.7%	0	0.0%	0	0%	4	2%
	Total	43	23.9%	59	32.8%	65	36.1%	13	7.2%	180	100%

Source: Investment Shanghai (2007).

Note: All MIPs are classified by the country of origin of the MNEs, the industry segment, and the location (L1= Pearl River delta; L2= Yangtze River regions; L3= Bohai Bay and large cities in North China; L4= Central and Western Regions).

The potential explanation for the difference between the two regions is their global connectivity. While Hong Kong in Pearl River Delta is more outward oriented with focus on exports, Shanghai in Yangtze River Delta is more inward oriented attracting inward investment to complement its manufacturing base.

The concentration of activities in L1 and L2 is as a result of the common characteristics of economic development, including large market size, and advanced infrastructure. The Yangtze River location however, is an agglomeration of both MIPs and Chinese domestic enterprises, which creates a different environment, compared with the Pearl River delta location. There is a full range of activities along the entire petrochemical value chain in the provinces of Yangtze delta. Established petrochemical industry parks in this location are among the most important factors to attract MIPs.

These industry parks are supported by the local governments, where preferential taxes are offered. For licensed operations of MIPs it is a precondition to establish cost-effective MIP

operations, that are able to optimize the use of public infrastructure, and to take advantage of cross-industry coordination within sectors, to avoid duplication of cost, to enable each of the units to focus on the development of its core business, and to make better use of synergies across co-located plants.

Another main MIP location (L3) is along Bohai bay and large cities in North China. This region is with strong foundation of domestic petrochemical industry with large and integrated petrochemical facilities. Such areas include concentration in Shandong province, Tianjin, Hubei province and major cities in Hebei province. Contrary to the concentration of foreign capital in Pearl River delta and Yangtze River delta, state-owned capital is overwhelming in this region. Foreign companies are facing the challenges of competing with the largest Chinese firms in this sector. To reduce the threat of competition, MIPs in these cities and regions are located near a number of large or medium-sized local Chinese enterprises. Shared control between foreign and Chinese companies is predominant choice for MIPs in this location, as this represent combing the location and the ownership advantages. Three quarters of MIPs are a form of a joint venture. By setting up joint ventures and collaborative projects with Chinese companies, foreign MNEs have been able to source raw materials and to access utilities at low cost, engineering services and marketing knowledge from local petrochemical partners, which in turn reduce their investment costs.

Until the late 1990s, the investment activities in the petrochemical industry created fragmentation which dampened any integration effort. Subsequently, with the large number of new signed MIPs, many local governments have implemented preferential policies to develop industry districts encouraging large integrated projects. The improvement of existing industry parks has attracted more large-scale MIPs. According to the selected cases, 44% of MIPs decided to locate their project in Yangtze Delta, and 95% of their production sites were located in industry parks, especially for the large refining and cracker projects. The remaining 5% of MIPs choose to invest in other locations for marketing purposes. The largest MIP in China's petrochemical industry is an integration project which is a joint venture between Yangtze Petrochemical and BASF.

Another factor to attract MIPs in these locations have been the infrastructure advantages such as: advanced transport system (water, air, rail and road) and a more comprehensive transport infrastructure, allowing MIPs to solve the transportation problem for raw materials.

6. Conclusions

Our study utilizes the most recent data from China's industrial census and business directory of MIPs. The principle effort in this paper is to discuss the proposition that both the host country institutional environment and the industry conditions are important determinants of the strategic investment choices. made by MNEs in their operations in China. MIP ownership structure is a result of a complex political process that involves a

foreign MNE in collaboration with the Chinese government and other partners in the project. Strategic choices in this context are not attributes of the MNE to establish a subsidiary, but are outcomes from negotiations and co-evolutionary adaptations between the political environment (Chinese government policies and priorities), the industry environment (the demand and supply conditions in different segments of the value chain), and the main actors (foreign MNEs, Chinese SOE, and government officials).

Location choices are affected by the motives of the MNEs and the moderating factors of the partners. Confirming this expectation we found that the JV investment projects represent 66% of the total number of projects in our selection.

From the total number of MIPs, 24% are lead by an American corporation, 33% are lead by a European MNE, 36% are lead by a Japanese firm, and 7% - by a corporation from other countries, including Korea and Taiwan. This distribution is consistent across all other variables – geographic location and positioning within industrial segments. MIPs for which foreign companies do not have a controlling interest tend to be those contracted before the liberalization of regulations for entrance restriction and prohibiting majority ownership. Following the liberalisation of this sector in conjunction with China's WTO entry, foreign investors have been able to establish more wholly owned projects.

The most attractive locations, according to the literature, are close to the consumer market, in order to capture market opportunities. Examples of such areas are Shanghai, Jiangsu, Zhejiang, Guangdong, Fujian, Shandong, Tianjin and other cities along the south and east coast, and all of them have a status of SEZs. They have large consumer market for petrochemical products, and MIPs in these regions have been facilitated by reduced costs of sales, and concentration of high-quality and comprehensive services. These factors have been the motives of MIPs to invest in the coastal cities and along the Yangtze River, Pearl River, although there are no oil deposits in these places. Exception, however, is the lack of MIPs in mainland China where there are market opportunities but not sufficient other incentives such as preferential policies on growth of the input and output markets.

MNEs rely on their superiority in capital, technology, and marketing. However, their strategic choices are very much influenced by the institutional environment in China and the industry structure in different segments of the petrochemical industry.

The results in our study indicate support for the theoretical expectation that the external environment is an important determinant for strategic choices of MNEs in the petrochemical industry. It is believed that these factors are complementary to one another and explain the configuration and strategies of MIPs. The findings show that industry concentration, in particular the clustering of foreign and domestic firms, exert strong positive effects on FDI location choices. Higher FDI concentration tends to attract more foreign firms. Better institutional support such as open policies, government efficiency also has positive effects on FDI location. Institutional support in term of infrastructure and some government policies to promote integration MIPs have also had a positive impact on location choices.

Contrary to some theoretical expectations, our study did not find strong effects of the country of origin of the lead MNE. Although European MNEs have shown higher propensity to engage in joint ventures (19% in EJV, and 6% in CJV), the US and the Japanese MNEs also were compelled to use this mode of entry (12% - 2% for the US and 18%-4% for Japan). Their distribution within the value chain also shows strong similarities with concentration of investments in downstream petrochemicals.

Overall, the results show the strong exposure of the Chinese petrochemical industry to global competition and access of global manufacturing capabilities, both of which are prerequisites for its global integration and upgrade.

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