

Foreign Invested Enterprises and Economic Development: The Case of China

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Middelheimlaan 1

2020 Antwerpen

ABSTRACT

This paper tries to further the understanding of subsidiary management, role and strategy, by specifically examining an un(der)explored dimension, i.e., the relationship between the multinational subsidiary and the developing host country, in particular China. This paper acknowledges that subsidiaries vary in their contributory role to the multinational system, based on head office assignment, subsidiary choice and host country environment. Instead of adopting the usual simplifying assumption that the host country environment is more or less given, or even that subsidiaries are seen as tapping into or drawing from the host country environment, subsidiaries are seen and analysed as contributors to the local economy. Based on host localisation, global integration and group responsiveness, a three dimensional model at the subsidiary level is developed to assess the economic impact on the host country for different clusters of companies, especially in terms of linkages, and research and development.

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1. Background and motivation

The presence and activities of multinational corporations (MNCs) in the developing world have often been the subject of controversy in discussions about development policy. The first serious discussions about the effects of foreign direct investment (FDI) on host countries date back to the late 1950s, when neo-classical economists started to analyse the implications of capital movements in standard models of international trade. Treating foreign investment simply as a capital flow between countries, it was shown in those models that foreign investment and trade could be substitutes for each other and that both were welfare improving (MacDougall, 1960). The liberal attitude towards FDI during the immediate post-war period was consistent with this theoretical understanding.

The unreservedly positive picture of the impact of FDI on host country welfare changed dramatically by the end of the 1960s. A strand of academic literature began to emphasize the connection between market imperfections and foreign investment, with focus on market structure issues. In line with Hymer's (1960) pioneering contribution, foreign direct investment was often seen as a result of oligopolistic home country markets. Consequently, it was feared that FDI would spread those market imperfections of the industrialised countries to the rest of the world. The earlier discussions of potential gains from the inflow of foreign capital in terms of tax revenues, economies of scale, and external economies gave way to analyses of the manipulation of transfer pricing, uneven development, and dependency in general. The emerging scepticism was often based on some negative experiences in the late 1960s and early 1970s, with certain blatant examples of incorrect behaviour by certain

multinational corporations (MNCs), e.g., inappropriate influence of political decisions, exploitative wages and poor social conditions.

With the failure of import substitution in Latin America and a number of Asian countries, and the international debt crisis of the early 1980s, attitudes towards multinationals changed again. More research was devoted to various positive external effects or spillovers of foreign investment that were important determinants of the development of host country industry (Blomström, 1989). The importance of multinational corporations for the international diffusion of technology, as well as their central role in world trade, was increasingly emphasized. During the 1980s, comparative research and surveys by the United Nations Center for Transnational Corporations (UNCTC) and the International Labour Organisation (ILO) of social conditions, effects on employment, choice of technology and training by multinationals and local companies painted a more positive picture for multinationals, and illustrated their better performance in comparison with local companies. This generally meant that foreign direct investment was more and more perceived as being an important determinant of economic growth in developing countries.

Another sea-change event that has significantly contributed to the growth of foreign direct investment was the increasing integration of China in the world economy that started with the opening up of the Chinese economy. Following the policy changes of 1978 –which the Chinese government announced as a means of accomplishing the Four Modernisations– the second session of the Fifth National People’s Congress approved as part of its Open Door policy on July, 1, 1979, the “Law of the People’s Republic of China on Joint Ventures Using Chinese and Foreign Investment.” This turnaround in China has to be seen against the disastrous economic performance of the centrally planned economy before 1979 and the successful examples of Japan and the four Asian Tigers (Wei, 1995). A ‘state foreign investment commission’ was installed to direct and oversee the investment process, and a number of agencies at the national and provincial level were set up to promote investment

from overseas. The objectives of soliciting and attracting FDI, as mentioned in various Chinese documents, was to develop a diversified industrial base, introduce and diffuse the transferred technology, stimulate economic growth, upgrade managerial and labour skills, and increase exports, especially manufactured goods (Kamath, 1990). However, China's attempt to foster economic growth with an emphasis on foreign trade and investment has been encompassed in its much broader strategy of modernisation, reconstruction, and reform, most directly aimed at moving the country toward some form of "market socialism," though the specific form and content of this evolution has not really been specified.

2. Literature review and research questions

There has been a profound evolution in thinking about the operations, organisations, and strategies of MNCs. Traditionally, researchers assumed that ownership specific advantages were developed at the corporate headquarters and leveraged overseas through the transfer of technology to a network of foreign subsidiaries (Hymer, 1960, Vernon, 1966, Buckley and Casson, 1976, Dunning, 1981). As these overseas subsidiaries grew in size and developed their own unique resources, however, it became apparent to many researchers that corporate headquarters was no longer the sole source of competitive advantage for the MNC. Scholars developed models such as the heterarchy (Hedlund, 1986) and the transnational firm (Bartlett and Ghoshal, 1989) to reflect the critical role played by many subsidiaries in the group's competitiveness, and research attention began to shift towards attempts to better understand the crucial roles played by subsidiaries. The increasing attention on the roles and/or strategies of manufacturing affiliates of multinational corporations is driven by the incessant search by MNCs for sustainable competitive advantage (Porter, 1990; Yip, 1992). As part of this process, proactive MNCs seek –and the reactive ones are forced to seek– a variety of ways in which their foreign affiliates can help increase the 'vibrancy' of corporate strategy (Bartlett and Ghoshal, 1986).

The basic concept underlying such research is that of subsidiary evolution. Research, mainly about FDI in industrialised countries, has shown that subsidiaries typically evolve along a number of trajectories. As subsidiaries are established for a variety of motives (e.g., resource, market, efficiency, or strategic asset seeking (see Dunning, 1993; Behrman, 1972)) and through a variety of modes (e.g., greenfield, acquisition, or joint venture), the reality is that a single evolutionary process for subsidiaries cannot be readily identified. Subsidiaries may shrink or die out, as well as expand, become larger and more specialised, and there are many different factors that influence such processes. There is already widespread acknowledgement that subsidiaries evolve over time, typically through the accumulation of resources and through the development of specialised capabilities (Hedlund, 1986, Prahalad and Doz, 1981). There are also a number of popular typologies that are based on the different roles and responsibilities of subsidiaries (e.g., Bartlett and Ghoshal, 1986, Jarillo and Martinez, 1990, White and Poynter, 1984).

While there is no shortage of typologies suggesting that subsidiaries are different in their contributory role to the multinational system, they all vary in their perspective on the reasons for these variations. In particular, three complementary perspectives can be determined from the MNC subsidiary literature (Birkinshaw, Hood and Jonsson, 1998). The first perspective is one of head office assignment, in which the head office is responsible for defining the strategic imperatives of the whole company and understands best how subsidiary roles can be attributed to ensure that those imperatives are met (Bartlett and Ghoshal, 1986; Gupta and Govindarajan, 1991, 1994; Roth and Morrison, 1992; Birkinshaw and Morisson, 1995). The second perspective starts from the so-called 'subsidiary choice,' whereby the role of the subsidiary is to a large extent open to the local managers and the decisions can be taken by them without prior authorisation from the parent company (White and Poynter, 1984; D'Cruz, 1986; Roth and Morisson, 1992; Birkinshaw, 1997; Taggart, 1997b). The third perspective focuses on environmental determinism, in which the role of each subsidiary is seen in large part as a function of its local environment (Bartlett and Ghoshal, 1986; Ghoshal and Nohria,

1989; Jarillo and Martinez, 1990; Westney, 1994). For instance, Birkinshaw and Hood (1997) specifically studied the impact of industry clusters on subsidiary roles and strategy.

Obviously, each of these three perspectives have considerable merit, but for a complete understanding of the phenomenon, it is necessary to present a more complete picture and to consider subsidiary, corporate, industry, and country factors. However, at the same time those three interpretations are competing with one another for relative salience (Birkinshaw, Hood and Jonsson, 1998). Furthermore, typologies indicate that evolution of strategy types is likely to occur (Prahalad and Doz, 1987; Jarillo and Martinez, 1990; Malnight, 1995; Taggart, 1998). Intuitively, very few subsidiaries indeed are likely to remain unchanged across both dimensions of integration and responsiveness (Prahalad and Doz, 1987; Taggart, 1998).

This paper tries to further the understanding of subsidiary management, role and strategy, and specifically examines an un(der)explored dimension, i.e., the relationship between the MNC subsidiary and the host countries, in particular developing economies. Although the economic impact of FDI on host countries is very well researched (for a review, see Dunning, 1994), the managerial dimensions, particularly as they relate to the subsidiary, have not been studied so extensively. It has long been recognised that one of the distinctive features of the MNC subsidiary is its dual allegiance to its host country and its parent company (Prahalad and Doz, 1987). The use of institutionalisation theory in the international context, for example, is built up on the observation that the subsidiary faces competing isomorphic pulls from the host country and the parent company (Westney, 1994). Also the research of Ghoshal and Nohria (1989) indicates that MNCs function like a differentiated network in which each subsidiary unit is on the one hand differentiated according to its immediate task environment and on the other hand integrated into its corporate system. Moreover, a number of subsidiary typologies explicitly consider the host country environment as a key distinguishing variable (for example, Bartlett and Ghoshal, 1986; Ghoshal and Nohria, 1989).

The nature of the relationship between the subsidiary and its host country environment is seldom spelled out, however. The most common approach is to adopt the simplifying assumption that the host country environment is more or less given, and that the subsidiary has to somehow adapt to it. A second approach is to see the subsidiary as tapping into or drawing from the host country environment. Examples of this approach are Porter's (1990) view that foreign-owned subsidiaries typically tap into local industry (clusters) in order to keep their parent company informed about leading-edge thinking in that cluster, and studies by Frost (1996, 1998) and Almeida (1996) that show how subsidiaries draw from local sources in their innovation processes.

A third approach, which has not been argued to any great extent in the academic literature, is to look at the subsidiary as a contributor to the host country environment. This view is conceptually and intuitively straightforward, because many national economies do indeed rely to a large degree on foreign-owned subsidiaries to provide employment, investment and exports (Birkinshaw, 1998). At the same time, though, most models of regional development of FDI (e.g., Ozawa, 1992; Dunning, 1993; Porter, 1990) are still based on the implicit assumption that an economy's principal firms are indigenous. This, it is argued, is a limiting assumption, and there is therefore need for research that looks explicitly at the impact that foreign-owned subsidiaries have on their host country economy. Such factors as the level of decision-making autonomy, the presence of R&D activities, and the relationship with local suppliers, are all likely to influence the development process in the host country and consequently the foreign subsidiaries themselves.

This impact of multinational subsidiaries is evident in many aspects of the host country's 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). The indirect economic impact is based on

industrial linkages of foreign subsidiaries with local and other foreign firms, particularly backward linkages by supplying materials, components and services. The importance of such indirect impact has been highlighted by many studies (Dicken, 1992, Kueh, 1992, Young et al., 1994, Williams, 1996, UNCTAD, 2001). However, the impact might be different according to the host country, depending on the government's intervention-based local content policies (ILO, 1981, 1984, Dicken and Quevit, 1994) and the particular strategies of MNCs (UNCTAD, 2001). Also the regional effects might vary because of differences in the levels of economic development and economic structure. Indeed, some regions in China, for instance, seem to have witnessed relatively stronger linkages with MNCs (Lan and Young, 1996).

The three approaches referred to earlier to model the relationship of the subsidiary with its host country are, of course, all partially true. When superimposed on one another, they suggest an ongoing process of development, whereby the subsidiary reacts and draws from the local environment at the same time as contributing to the local economy as a whole as well as to specific business partners. Over time, it is argued, the subsidiary co-evolves with its environment and gradually plays a more important role in the local economy. The subsidiary itself typically goes through a development process where it gains enhanced value-added scope and greater decision-making autonomy (Birkinshaw and Hood, 1997), and this process is both driven by and a source of benefit to the local economy.

In sum, multinationals decide their strategies depending upon a number of characteristics related to their technologies and products as well as the characteristics and policies of the host countries. The MNCs strategic decisions then determine how their affiliates affect the host economy. Most host country governments simultaneously try to influence the behaviour of the foreign MNCs operating in their territory, either directly through regulations or indirectly by affecting the environment in which the MNCs operate. To the extent that these interventions affect the behaviour of the foreign MNCs, they also have an impact on the host

economy. As a result of this intricate interplay between firm strategies and host country policies, it is possible that foreign subsidiaries may either contribute significantly to the growth and development of the host country, or that they may have negative or negligible effects on the local economy.

The purpose of this paper is to report on an empirical study of the issues discussed above. More specifically, the focal interest is the process of subsidiary strategic evolution over time, and the extent to which that process impacts on the host country. The research, then, has a dual focus, in that at the one hand it is straddling the perspectives of subsidiary managers and on the other hand host country policy-makers. While the empirical analysis is strongly based on the activities of subsidiaries, the discussion will lean towards understanding the implications of such activities for policy-makers. This approach makes it necessary to develop a categorisation of subsidiaries that focuses on the subsidiary roles/strategies vis-à-vis the host country economy.

The primary research questions follow from the preceding discussion and, in particular, from the specific conceptualisation of the Integration-Responsiveness (I-R) framework (Prahalad and Doz, 1987, Bartlett and Ghoshal, 1989, Jarillo and Martinez, 1990, Taggart, 1997a, 1998). Prahalad and Doz (1987) formally described the integration-responsiveness framework, within which direct trade-offs between the two strategic dimensions could be detected in a number of MNCs. This notion of a spectrum of strategies on the reverse diagonal of the model (high integration-low responsiveness to low integration-high responsiveness) was given impressive empirical validation in a multi-industry survey by Roth and Morisson (1990) and in a single industry study by Johnson (1995).

Jarillo and Martinez (1990) developed the I-R framework with specific reference to manufacturing subsidiaries of MNCs, though they used the term localisation instead of responsiveness. In a study of 50 foreign affiliates located in Spain, they identified three

strategies. Corresponding to the 'global organisation' of Bartlett and Ghoshal (1989) and the global businesses of Prahalad and Doz (1987), they first identified a cluster which they termed 'receptive subsidiaries.' These are likely to belong to global firms competing in global industries. Here, few value chain functions (including, though, marketing and sales) would be performed within the host country, and the affiliates would be highly integrated within their networks. Based on Bartlett and Ghoshal's 'multinational organisation' and Prahalad and Doz's locally responsive businesses, they also labelled a group of subsidiaries 'autonomous,' likely to be competing in multidomestic industries. These affiliates are strongly decentralised with respect to their headquarters and sell a high proportion of their manufactured output in the host country. The third cluster consists of 'active subsidiaries,' and may be linked to Bartlett and Ghoshal's 'transnational organisation,' though they lack an obvious parallel in the Prahalad and Doz's typology. This strategy implies the location of a substantial number of value chain activities in the host country, though these are explicitly coordinated with similar activities in other parts of the international network. While accepting that a subsidiary may occupy any of the four quadrants of their model, Jarillo and Martinez do not give a name or description to the low integration-low responsiveness variant. Neither did they find any examples within their sample of companies.

The Jarillo-Martinez model was later adapted and extended by Taggart (1997b, 1998) who also identified a group of affiliates, which he entitled 'quiescent,' in the low integration-low responsiveness quadrant. Corresponding to Bartlett and Ghoshal's 'international organisation,' this type of subsidiaries bears a strong resemblance to aspects of White and Poynter's (1984) miniature replica subsidiary, adopter or adapter type. Taggart also observed an anticlockwise evolutionary trend for the four groups of subsidiaries. In line with the predictions of Prahalad and Doz (1987), quiescent subsidiaries appear to gain some responsiveness at the cost of giving up a degree of integration, while active subsidiaries make the opposite change. Autonomous subsidiaries, on the other hand, show gains in both integration and responsiveness, while receptive affiliates lose on each dimension (Taggart,

1998). Taggart tentatively proposed a three dimensional framework including network responsiveness in order to accommodate for the positive relationship between integration and responsiveness on the leading diagonal and the negative relationship between integration and responsiveness on the reverse diagonal.

In order to be able to differentiate among the different subsidiaries and their economic impact on the host economy, an appropriate –additional to the subsidiary strategy– typology had to be developed (see Figure 1). Figure 1 gives an overview of former I-R typologies with the new framework superimposed. Quiescent subsidiaries are managed as ‘zions’ and are likely to have fewer value chain activities than autonomous subsidiaries. The latter subsidiaries seem to concentrate on the subsidiary’s own needs as autonomous affiliates are most sensitive to the host market needs when adapting or developing new and improved products. Autonomous subsidiaries typically are highly involved in the host country economy. The quiescent subsidiary may have significantly fewer linkages with the remainder of its internal network than the receptive subsidiary, which improves the global integration of the host economy. Active subsidiaries are highly responsive to the market needs of other subsidiaries belonging to the group while retaining a high degree of localisation, bringing the highest contribution to the host country.

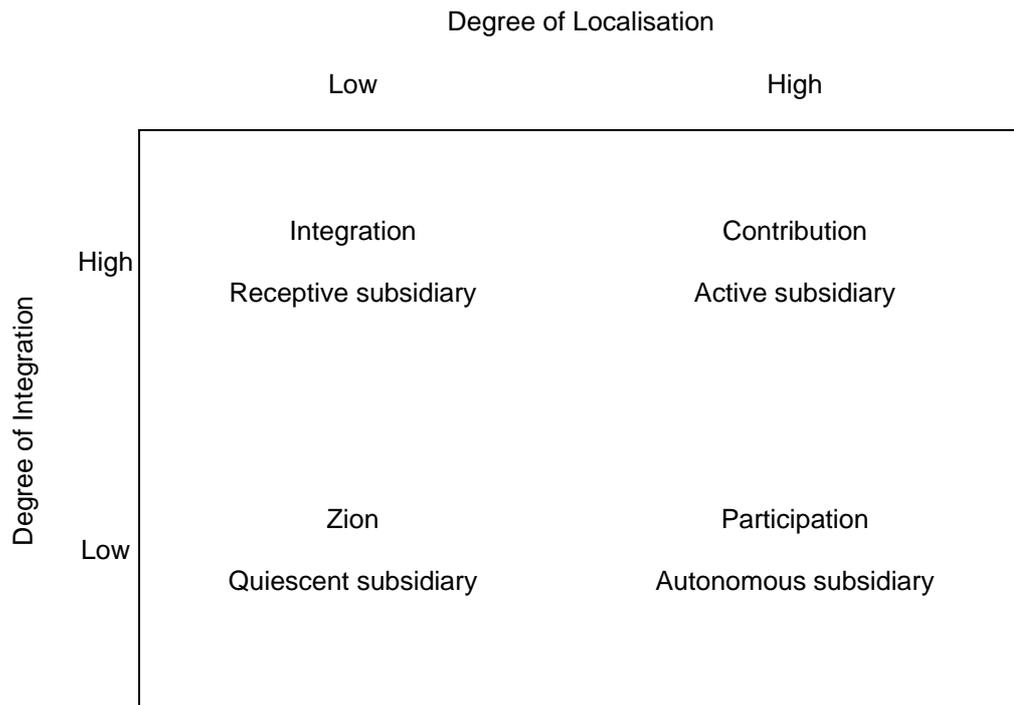


Figure 1. Integration-responsiveness framework at subsidiary level in terms of host country impact and development.

The following research questions are addressed:

1. What differences exist between the four types of subsidiaries (in terms of their profile, their relationship with the parent company, the multinational network, and the host country)?
2. What are the prospects for a significant economic impact on the host country for each type of companies in terms of linkages and research and development?

3. Methodology

3.1. Sample

The survey focuses on subsidiaries in the People's Republic of China for which Belgian firms were responsible. This means that a certain number of firms are included, which are foreign owned, but for which Belgian firms are in charge. The list of subsidiaries was drawn from

several sources, including information provided by the Chinese Ministry of Foreign Trade and Economic Cooperation (MOFTEC), the Belgian Embassy and Consulates in China, employer's federations, and the financial press. About 100 relevant subsidiaries were identified on the basis of these sources, while the data collection was based on a postal questionnaire. The questionnaire was sent to the General Manager of these companies in the summer of 2000. However, to complement the written answers to the questionnaire, supplementary information was collected by telephone calls and personal interviews that were carried out throughout China from July through October 2000. These interviews were conducted, either with the general manager or another top manager, starting in Guangzhou and surroundings, onto Shanghai and surroundings, including Suzhou, Wuxi, and Nanjing, and finally Xi'an and Beijing.

At the end of this information gathering process 48 valid responses were obtained. About half of the replies were given by the General Manager of the Belgian subsidiary in China, while the other half was answered by members of the top management of the firms. Just over half of the respondents were Belgians, while about a third were Chinese, and the rest belonged to another nationality, mostly a European one. The average representative Belgian manufacturing subsidiary has been established in China for some 8 years now, employing just over 400 people and realising annual sales of almost 400 million yuan, of which 22 percent was exported (including sales to other affiliates of the same multinational group). About a quarter of the responding firms were involved in some aspect of engineering (instrument, electronic, electrical, mechanical, vehicle) and in the food industry, respectively. Almost twenty percent operated in the chemical industry, with just over ten percent each in the non-metallic mineral and metal industries.

4.2. Measurement

In order to categorise subsidiaries according to their localisation in the host country, global integration and network responsiveness, a construct was developed for each of these three dimensions. Prior research does not necessarily provide a trustworthy construct for either dimension (Prahalad and Doz, 1987, Jarillo and Martinez, 1990, Taggart, 1998). Most variables in previous research studies are not intuitively unidirectional, meaning that sometimes variables do not load significantly and uniquely on either dimension. For instance, one of the measures of localisation of Jarillo and Martinez (percentage of inputs that comes from the group) would be more readily interpreted as a measure of integration.

Local responsiveness or localisation was operationalised by two variables that were measured in percentages on the basis of answers on the following questions:

- What percentage of products, sold by the subsidiary, have been created or substantially modified for the Chinese market?
- What percentage of R&D, incorporated into the products sold by the subsidiary, is actually carried out in China?

Global integration was operationalised by two variables, drawn from Prahalad and Doz (1987) and Taggart (1998), and were measured on a five-point Likert-type scale and were based on:

- Manufacturing decisions that involve the Chinese subsidiary are made with a view to acquire international market linkages.
- Product specifications that are developed and coordinated by the subsidiary serve many of the corporate parent's geographically defined markets.

Network responsiveness was operationalised by two variables, also drawn from Prahalad and Doz (1987) and Taggart (1998). They were also measured on a five-point Likert-type scale on the basis of answers to the following statements:

- Technology development that is carried out in different locations throughout the multinational group, with each location specialising in a specific technical area or product line. The output is shared by all subsidiaries.
- Substantial movement of semi-finished and finished products exists between the subsidiary and other subsidiaries belonging to the same multinational group.

In order to validate the typology, it should be tested with alternative variables. The different classifications in a conceptualised typology may be regarded as a derived taxonomy if significantly different values of the alternative variables are associated with each classification. The following variables will be included:

- the size of the subsidiary, measured in sales (million yuan) and number of employees;
- the export propensity, measured as a percentage of overall sales;
- the extent of value adding activities: marketing, sales, after sales service, manufacturing, research and development;
- the level of production complexity, measured on a five-point Likert-type scale ranging from 1 = assembly only, through 5 = fully fledged manufacturing;
- the level of ownership, measured as a percentage of equity ranging from 1 = 10-50%, 2 = 51-99%, and 3 = 100%;
- the mode of entry, with 0 = greenfield and 1 = acquisition;
- the extent of R&D, measured as a percentage of total sales;
- the nature of R&D, measured on a six-classification scale including none, customer technical services, adaptation of manufacturing technology, development of new or improved products for Chinese customers, development of new products and processes for world markets, generation of new technology for the corporate parent;

- the sourcing strategy, measured by purchases from local suppliers, Asian suppliers, other foreign third party suppliers, subsidiaries of the multinational group and finally headquarters;
- the sales strategy, measured by sales to customers in China, in Asia, in the rest of the world, to affiliates belonging to the group, and headquarters;
- the decision-making authority, measured on a five-classification scale from 1 = “decided mainly by the parent company or headquarters without consulting with or seeking the advice of this subsidiary” to 5 = “decided mainly by this subsidiary without consulting with or seeking the advice of the parent company or headquarters.”¹

3.3. Data analysis

The analysis consisted of three stages. Initially, a principal factor analysis was carried out on the three two-variable dimensions (host localisation, global integration, network responsiveness) to ensure that the variables loaded significantly and uniquely on the appropriate dimensions. It is generally accepted that for a sample of approximately 50 companies, with significance based on a 0.05 significance level, and standard errors assumed to be twice those of conventional correlation coefficients, the required minimum factor loading is 0.75 (Hair et al., 1998).

Second, and with respect to the proposed framework, both hierarchical and non-hierarchical cluster analysis was used to assess and identify the underlying group structure of the sample.

¹ Due to limitations in terms of the length of the article, an average was taken of the following variables: the market area served, the product range supplied/service offered, changes in product design/service offering, the production capacity, subcontracting, advertising and promotion, approval of annual budgets, human resources, research and development, introduction of a new manufacturing process, new manufacturing technology. This aggregate average was used in the statistical analysis.

Hierarchical clustering was used to determine the number of underlying clusters of affiliates in the sample, using the cubic clustering criterion. Average linkage cluster analysis was used as this is particularly efficient when the sample contains natural and distinct clumps of firms. This was checked by non-hierarchical K-means clustering.

Finally, while multivariate analytical techniques –using the host localisation, global integration and network responsiveness constructs– may yield a classification of subsidiaries, it was deemed interesting to classify these strategies according to the “control” variables discussed above. Besides, in order to avoid a self-fulfilling prophecy, it has been strongly advocated in the literature that alternative variables are used to test the validity of any such derived classification. In addition, this allows for a richer interpretation of the results (Harrigan, 1983, Venkatraman and Grant, 1986, Morrison, 1990, Roth and Morrison, 1992). Thus, a real taxonomy could be obtained, and not a mere typology, for it would be based on empirically based dimensions. As such, analysis of variance was used to identify significant differences between the clusters across the alternative variables, as an assessment of Research Question 1. As this represents an assessment of systematic variation across subsidiaries rather than assessing a hypothesis, a post hoc procedure, such as Duncan’s multiple range test, is the appropriate tool for evaluating significant differences between pairs of clusters (Roth and Morrison, 1990).

4. Results

The six variables measuring host localisation, global integration and network responsiveness variables were subjected to principal factor analysis using an orthogonal varimax rotation, and the three factor solution is shown in Table 1. The factor analysis retained three factors by default. It can be seen that the variables load on the three factors as expected, and that they load significantly and uniquely. All the variables load above the 0.75 threshold, while none of the residual correlations are significantly higher than the 0.2 value that would be accepted as

adequate. The total variance explained is more than 75 percent, which is quite a reasonable amount, giving good confidence in the model. The first factor loads on the global integration variables, the second on the network responsiveness variables, while the third loads on the host localisation variables.

Table 1. Principal factor analysis, orthogonal varimax rotation, Belgian firms in China (2000)

Variable	Factor 1	Factor 2	Factor 3
What percentage of products, sold by the subsidiary, have been created or substantially modified for the Chinese market?	0.03282	0.12227	0.81333
What percentage of R&D, incorporated into the products sold by the subsidiary, is actually performed by the subsidiary itself?	-.16114	-.22773	0.81456
Manufacturing decisions that involve the subsidiary are made with a view to provide international market linkages for this subsidiary.	0.92915	0.07727	0.07051
Product specifications developed and coordinated by this subsidiary serve many of the corporate parent's geographically defined markets.	0.87941	0.18584	-.021586
Technology development is carried out in many locations throughout the multinational group, with each location specialising in a specific technical area or product line. This output is shared by all subsidiaries.	0.03954	0.85856	-.19719
Substantial movement of (semi-)finished products exists between the subsidiary and other subsidiaries of the same multinational group.	0.20327	0.77874	0.12260
Variance explained	0.3624	0.2205	0.1818

In the second stage of the data analysis, hierarchical clustering was used to make an assessment of the number of clusters. This approach indicated that four natural clusters of affiliates seemed to be present, as the cubic clustering criterion jumped from 1.87 for three clusters to 7.11 for four clusters, where it hovered about for higher number of clusters. This was verified by the non-hierarchical K-means clustering method. Again, the four clusters solution was the first where the cubic clustering criterion was higher than the final seeds

criterion, indicating that four clusters are the most appropriate solution. Table 2 presents some more information about the results that were obtained.

Table 2. Non-hierarchical clustering on the host localisation, global integration and network responsiveness of Belgian firms in China (2000)

Number of clusters	Final seeds criterion	Cubic clustering criterion	Pseudo F-statistic	Approximate overall R ²
2	13.6119	1.894	51.25	0.50102
3	9.8433	2.719	63.61	0.71072
4	6.2422	7.107	122.43	0.79609
5	4.8064	8.713	163.46	0.84682

The means of the host localisation, global integration, and network responsiveness are shown in Table 3. The four cluster solution yields a group of 21 quiescent, 5 autonomous, 12 receptive and 10 active subsidiaries. However, there seems to be a skewness towards quiescent subsidiaries in comparison to the other categories, which is probably due to the relatively recent opening up of the Chinese market and the resulting limited existence of most of the subsidiaries (average year of establishment: 1994). These quiescent subsidiaries seem to be poorly localised with a low percentage of products created or substantially modified for the local market and with a low percentage of R&D (incorporated into the products sold by the subsidiary) actually performed by these subsidiaries. They are neither globally integrated nor responsive to their ‘sister subsidiaries’ needs. Autonomous subsidiaries are, however, even less globally integrated or responsive to other subsidiaries in the multinational group, but are highly localised with high R&D and product adaptations. Active subsidiaries also have high product adaptation, but not all the R&D that they perform is to their own benefit. Receptive subsidiaries are poorly localised, but they are highly integrated and internally responsive.

Table 3. Cluster analysis: Means of four cluster solution

Variable	Cluster 1, Active n = 10	Cluster 2, Autonomous n= 5	Cluster 3, Receptive n = 12	Cluster 4, Quiescent n = 21
Host localisation				
Products for Chinese market (%)	81.5	87.3	7.5	7.9
Subsidiary R&D in products (%)	8.3	74.5	10.0	3.1
Global integration				
Manufacturing decisions (1-5)	2.3	2.0	3.0	2.3
Product specifications (1-5)	2.7	1.8	3.0	2.6
Network responsiveness				
Technology sharing (1-5)	2.7	1.8	3.5	2.0
Material flow linkages (1-5)	2.6	1.6	3.0	2.0

Note: Higher scores signify either higher localisation, integration or responsiveness.

In stage three of the data analysis, ANOVA and Duncan's multiple range tests were carried out across the alternative variables, and the results are shown in Table 4. The model is generally well corroborated by the multitude of variables, although the post hoc tests indicate that the amount of sales and the production complexity are not effective separators of the clusters, though all other variables are effective in some way. This is especially true for the variables with regard to R&D. Autonomous and especially active subsidiaries register the highest R&D expenditures, although these are clearly directed towards the development of new or improved products for Chinese customers and the development of new products and processes for world markets, respectively. Receptive subsidiaries are clearly developing new products or processes for world markets or generating new technology for the multinational group, with a score of 4.5. Quiescent subsidiaries have the lowest sort of R&D with customer technical services or perhaps some adaptation of manufacturing technology.

Table 4. Comparison of means of alternative variables among four clusters of Belgian subsidiaries in China (2000).

Variable	Cluster 1, Active n = 10	Cluster 2, Autonomous n= 5	Cluster 3, Receptive n = 12	Cluster 4, Quiescent n = 21	F-statistic	Differences between clusters
Sales	486.5	251.6	150.0	392.1	1.37	None
Employees	504	552	51	381	2.22	1,2,4>3
Exports	30.8	3.6	50.0	20.67	2.01	3,1,4>2
Value added	2.4	2.6	2.5	2.0	2.37	2,3,1>4
Production	4.6	4.8	4.0	3.7	1.42	None
Equity	2.1	1.6	2.5	2.1	1.91	2<1,3,4; 3>1,4,2
Acquisition	0.2	0.6	0	0.14	2.99	2>1,4,3
R&D (%)	1.86	1.80	0.23	0.76	2.92	1,2>3,4
R&D	3.6	3.0	4.5	1.5	3.39	3,1,2>4
Local sourcing	58.8	48.0	25.0	33.8	2.18	1,2>4,3
Group sourcing	19.8	9.0	60.0	16.2	2.57	3>1,4,2
Local sales	79.4	96.0	45.0	79.86	2.31	2>4,1,3; 2,4,1>3
Group sales	13.60	2.40	45.0	6.67	3.95	3>4,2,1
Autonomy	3.375	3.7955	2.3636	3.0574	4.02	2,1,4>3; 2>1,4,3; 2>4;

Local sourcing is the highest for autonomous and active subsidiaries, while receptive subsidiaries source the most from other group subsidiaries. Autonomous subsidiaries sell most of their output on the local market, while receptive subsidiaries divide their sales almost equally between Chinese customers and group affiliates, with active and quiescent subsidiaries situated somewhere in between these categories. The analysis confirms that decision-making autonomy is the lowest for receptive subsidiaries, with most of the decisions

being taken by the corporate parent or headquarters after consulting with or seeking the advice of the subsidiary. As expected, autonomous subsidiaries take most of their decisions themselves, sometimes after consulting with or seeking the advice of the parent company or headquarters. Quiescent and active subsidiaries again take up an intermediate position. A final but interesting result are the differences with regard to the mode of entry and degree of ownership. Autonomous subsidiaries have the highest propensity for acquisition, with the lowest degree of equity ownership. If you want to get a head start with regard to market entry, which is a major reason for establishing an autonomous subsidiary, an acquisition is obviously a preferred choice. Partners, for instance the former owner of the acquired firm, are seen as important ways to broaden inroads into the Chinese market. Receptive firms have the highest ownership degree, with no acquisitions at all. For them, partners and existing distribution channels and customers are not as important as control over the subsidiary's contribution to the multinational network.

5. Interpretation and discussion: Prospects for development

The analysis thus far was closely based on the data. In order to address the second research question, namely in terms of prospects for development and impact on the Chinese economy, this section is somewhat more speculative. While based on the data above, it also draws on the authors' general understanding of subsidiary companies and on the specific understanding of the situation in China.

Group 1. Participation by autonomous subsidiaries

The so-called 'autonomous' group consists primarily of subsidiaries that were set up mainly to serve the Chinese marketplace. Almost all of the sales of these affiliates are made locally, with a very low percentage of exports. They have the most value-added activities in the sample and score highest in terms of production complexity and employment. Autonomous subsidiaries spend relatively high amounts on R&D, although mostly for local projects. About

half of their inputs is sourced in China, despite their relatively high decision-making autonomy. Acquisitions are an often chosen option, while ownership levels are quite low. In terms of their impact on the host country economy, these autonomous subsidiaries are actively engaged in the local economy, although there is lots of room for improvement. This is especially so, if one takes into account that only a handful of affiliates qualify for this cluster of companies that are supposed to have a substantial impact on the host country, in particular with regard to local linkages.

Group 2. Contribution by active subsidiaries

‘Active’ subsidiaries are the most intense sourcers in China as almost 60 percent of their purchases are carried out locally. They spend most on R&D, and not just for local adaptation purposes. They also sell a substantial proportion of their production in the Chinese market, although they do export about a third of their output, divided equally between other group affiliates and foreign customers. Their decision-making authority is relatively high, although they participate in some group sourcing with other subsidiaries. In a way, these active subsidiaries can be considered as improved autonomous subsidiaries, with equally high local linkages but with stronger global integrative links, and especially more intense network responsiveness. The contribution of these subsidiaries not only consists of adaptation, but also includes innovative activities beyond the local market.

Group 3. Integration by receptive subsidiaries

‘Receptive’ subsidiaries are the smallest in size, both in terms of sales and number of employees. All of these subsidiaries in the sample are greenfield investments, with high degrees of ownership. Although very little R&D is carried out, some engage in research and development for global purposes. While group sourcing is very high, local sourcing is quite low as only about 25 percent of components, parts and equipment are sourced in China. Exports constitute about half of their sales, with almost all of them directed to other group affiliates. The decision-making autonomy of receptive subsidiaries is rather low, with most

decisions being taken at the level of the headquarters. While these affiliates are not really oriented to the local market, they contribute to China's integration in the global economy.

Group 4. Zion by quiescent subsidiaries

The largest group of affiliates in the sample are the quiescent subsidiaries. They take up an intermediate position in most of the variables, although their R&D is of a lower order, with some customer technical services, but mostly adoption of group technology. As mentioned before, the presence of such a large number of quiescent subsidiaries is probably due to the fact that many only started up their operations in China during the last few years. Recently established subsidiaries are typically less autonomous than older ones. Most of these subsidiaries currently still function as some sort of stronghold to test the Chinese waters, but their impact on the host economy is rather limited, especially in terms of sourcing linkages, and research and development, but also in terms of their integration into the global economy.

It should be noted that the general level of some variables with respect to host localisation, global integration and network responsiveness is rather low, and not just for the quiescent type of subsidiaries. However, through supply linkages, industrial growth, technology transfer, management improvement and job creation, regional development can indeed be spread over many local enterprises (Lall, 1980, Dicken, 1992, UNCTAD, 2001). Given the significance of inter-firm linkages in economic development, the government of the host regions should employ proper measures to develop and extend these linkages.

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