MNC Overseas Subsidiaries in Japan:
In Search of Centres of Excellence

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[Abstract]
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- Doctor of Business Administration
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This research aims to 1) analyse the key roles and activities performed by foreign MNC subsidiaries in Japan, and 2) investigate the key factors leading to the creation of centres of excellence among those subsidiaries.

We surveyed 134 MNC foreign subsidiaries in Japan and identified three key areas for the formation of centres of excellence in Japan. The first is the continuous expansion of R&D activities; the second is the integration of R&D processes and functions within the rest of the MNC; the third is subsidiary linkage with external suppliers.

Whilst we have many in-depth studies of multinational MNC activities in markets outside of Japan, fewer investigate foreign MNC activities in Japan. Our study has practical implications for senior management of multinational MNCs who intend to start up or expand operations in the Japanese market.

In summary, centres of excellence in Japan need to have all-round balanced capabilities with strong competence in the R&D area.
According to a survey conducted by JETRO (2002), many potential overseas investors claim that Japan still has many barriers to market entry. For instance, when Phillips established a marketing division for its subsidiaries in Japan, aiming to use them as a ‘Japanese Window’ through which to keep their eyes and ears on the Japanese market, they could only detect market developments after a new wave had moved through – they never managed to penetrate the market (Bartlett and Ghoshal, 1989). According to a senior Philips manager in Japan interviewed by Bartlett and Ghoshal at the time, a company coming into the Japanese market must get ‘inside the bloodstream’ of the business and gain access to distribution channels, component suppliers, and equipment manufacturers. Thus, academic research to assist this area is quite beneficial for non-Japanese Multinational Corporations (MNCs) who are considering entry into Japan. In the long run, we believe it will help to generate more FDI (Foreign direct investment) inflow to the Japanese market.

As the Japanese economic structure further matures, especially with the domestic market shrinking, some key measures are essential to keep the Japanese economy thriving. One of such measure would be to increase Japan’s level of exports; this is already the key focus, and a number of necessary measures have been taken by political and industrial leaders in Japan. However, another key initiative, to increase the level of inward investment into Japan through FDI, has received less attention within Japan.

The Japanese government has tried to promote FDI inflow as a generator of new technology and know-how, with an eye to promoting the chances of developing high value-added business through innovation and technology accumulation. FDI in Japan reached a historical record of ¥9,000 billion in 2007, a steady and continuous rapid increase from ¥2,300 billion in 2001 (Ministry of Finance, 2012). However, 2007 was the peak of FDI expansion in the Japanese market, and FDI inflow since has dropped steadily.

![Chart 1-1: Comparison of FDI inflow to Japan](¥0.1 billion)

<table>
<thead>
<tr>
<th>Year</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>22,201</td>
<td>40,304</td>
<td>27,275</td>
<td>35,508</td>
<td>38,135</td>
<td>53,615</td>
<td>80,201</td>
<td>38,449</td>
<td>41,609</td>
<td>38,239</td>
<td>32,565</td>
</tr>
</tbody>
</table>

Source: (Japanese Ministry of Finance 2012)

Also, when we compare the recent impact of FDI inflow on G5 nations, as we discover that
FDI inflow has had a significant impact on most of the G5 countries; FDI inflow (stock-based) ranges from around 20% to 50% comparing with size of GDP, whereas Japan's FDI inflow (stock-based) has ranged only around 3% to 4% in last several years. This is a remarkably low level. Therefore, it is also possible to say that FDI inflow to Japan still has an enormous potential to grow from this perspective. As Japan moves toward a more mature economic structure, it is important to understand the nature of FDI and to make the Japanese market more attractive for further FDI, as has already been done in other developed nations such as Britain. In particular, given the recent nature of FDI inflow within the Japanese economy, the expected role and activities of MNC foreign subsidiaries in Japan need to be clarified and understood better. By identifying key factors for the formation of centres of excellence among MNC subsidiaries in Japan, both Japanese government officials and MNC management will be able to focus more on entry into the Japanese market, enabling an increase in the level of FDI.

Major researchers such as Frost, Birkinshaw, and Ensign (2000), and Holm and Pedersen (2000) have focused on the emergence of centres of excellence, which are viewed as ‘subsidiaries recognised within the MNC for specific functional activities’ (Birkinshaw, Pedersen, 2008, 371).

However, whilst we have many in-depth studies of multinational MNC activities in markets outside of Japan, very few investigate foreign MNC activities in Japan. One of few exceptions was an empirical examination of American MNCs and their subsidiaries in Japan (Robinson, 1995). But the Robinson study focusing on the inter-relationships between US headquarters and their Japanese subsidiaries, such as the sharing of Sales/R&D activities between Japan and the US. In terms of pure MNC subsidiary strategy review from an academic viewpoint, unlike cases in Europe and in Canada, we were not able to find any significant works so far on foreign MNC subsidiary operations in Japan. Thus, a key motivation of our research to fill the void with an academic business strategy study of foreign MNC activities in Japan.

This research aims to 1) analyse key roles and activities performed by foreign MNC subsidiaries in Japan, and 2) investigate key factors leading to competence-creating subsidiaries among foreign MNC subsidiaries in Japan. This study utilises well-established existing academic frameworks in order to give practical guidance to MNC senior management, who often view the Japanese market as an especially difficult market to get into.

Although there are few substantial studies which concentrate on foreign MNC activities in
Japan, we were able to use existing academic frameworks developed by analysing MNC subsidiary activities in non-Japanese markets and adjust them accordingly. For instance, to identify ‘strategic subsidiaries’ and to investigate the key factors involved in the creation of those strategic subsidiaries, we referred to several notable studies. We focused especially on Frost, Birkinshaw, and Ensign’s ‘centre of excellence model’ (2002), as this gave a clear definition of superior subsidiaries and laid out the relevant factors which had helped them attain that status. In addition, in order to articulate ‘strategic subsidiaries’ precisely, other notable studies identifying ‘strategic subsidiaries’ – such as Jarillo and Martinez (1990), Bartlett and Ghoshal (1989), and Cantwell and Mudambi (2005) – were carefully examined. Anderssen, Forsgren, and Holm’s ‘embedded multinational model’ (2002) was also important for us as their model brought in the concept of linkages with external players outside the MNC boundary. This is an especially important point for our study, as success in the Japanese market must take account of the impact of *keiretsu*.

Reflecting the key findings from the above studies, our research methodology is based on the ‘centres of excellence’ model of (Frost, Birkinshaw, Ensign, 2002), and was enhanced by the ‘business network’ model presented by Anderssen, Forsgren, and Holm (2002), which we used mainly to analyse external linkages of MNC subsidiaries in Japan.

Following the introduction in chapter 1, we analyse the key academic literature on MMC subsidiaries studies in chapter 2, and chapter 3 gives an overview of the methodology of the study and explains how we constructed our research framework. This chapter examines the respective virtues of quantitative and qualitative analysis and their suitability for this study. It also looks at what kind of MNC subsidiaries should be targeted as research objectives (with regard to nationality, industrial sector, and so on). We define dependent variables (for the selection of centres of excellence) and independent variables (factors influencing the formation of centres of excellence), set hypotheses, formulate the questions for the questionnaires to collect the necessary data, then explain how we have collected the actual data.

Chapter 4 discusses the descriptive analysis of dependent and independent variables based on the findings of our field study. Chapter 5 examines the most influential independent variables involved in the formation of strategic foreign MNC subsidiaries (centres of excellence) in Japan by going through applicable regression and robustness analyses, and verifying our initial hypotheses. Chapter 6 summarises the key findings of the study and suggests next steps.
This research makes two key contributions.

First, we aim to identify common issues affecting less strategic foreign MNC subsidiaries in Japan clearer, and to give them the keys to open the door to become more strategic players—to become Centres of Excellence in a market where many foreign MNC subsidiaries are struggling to maximise their potential. Especially, we hope our study can give the clear guidance to MNC management newly trying to get into the Japanese market. As we have discussed, because of the substantial lack of the profound study on foreign MNC subsidiaries activities in Japan, we tend to see quite subjective observations to put the blames on the Japanese market structural problems to justify the difficulty to make foreign MNC subsidiaries operation successful in Japan. When we look into the key findings from our study, we believe that the management of foreign MNC subsidiaries in Japan can identify lots of areas where they can improve, thus turning their operations in Japan more strategically successful.

Second, although our study clarifies many key areas foreign MNC subsidiaries in Japan can improve by themselves, our study sends a clear message to Japanese government officials responsible for expanding FDI into the Japanese market that changes are needed to address the Japanese market’s structural problems as well.

Ultimately, the most valuable input from our study is the understanding of conditions necessary for MNC subsidiaries to form centres of excellence in Japan in contrast to those necessary for the formation of centres of excellence in the Western market. Thanks to help from a number of contacts, this was achieved by collecting high-quality data from MNC subsidiaries in Japan; we could therefore analyse this data effectively by utilising the established academic frameworks on MNC subsidiaries, adjusting them to suit the Japanese market situation.

We would like to express our gratitude to all those, and especially Dr. Axele Giroud, for giving us the guidance to achieve this ambitious study.
Chapter 2: Literature review

1. Introduction

In this chapter, we review key academic literature which examines foreign MNC subsidiaries' development and roles. As Birkinshaw and Pedersen (2008) have reviewed key works on MNC subsidiaries, we also especially aimed for an overview of the key literatures discussing the activities and responsibilities of MNC subsidiaries, and how the key literatures analyse these MNC subsidiary activities especially in terms of their relationships with the other entities inside and outside MNC group.

MNC literature has recently shifted its focus from the HQ-subsidiary relationship to concentrate more on subsidiary development and the subsidiary role stream, as studies of MNC subsidiaries from a hierarchical viewpoint do not match the actual current roles of MNC subsidiaries (Harzing, 2002). In order to identify factors contributing to the formation of strategic subsidiaries in the Japanese market, we planned to utilise academic frameworks found in existing studies of MNC subsidiary activities in non-Japanese markets, so we had to conduct a thorough review.

In the first section of this chapter, we observe trends in the development of studies of MNC subsidiaries. Harzing (1999) has noted the way that studies of MNC operations, and especially the relationship between HQ and subsidiaries, accelerated in the 1970s, while analyses of the roles of MNC subsidiaries roles flourished in the 1980s, and studies of MNC subsidiary development increased throughout the 1990s.

In this section we focus especially on key literature such as ‘Managing across borders’ (Bartlett and Ghoshall, 1998), discussions of the ‘Differentiated network (Transnational) model’, and ‘Managing the embedded multinational’ (Forsgren, Holm and Johanson, 2005) as well as discussions of the ‘Business network model’. The main aim for reviewing these key works is not only to understand these important academic studies, but also to identify important differences between these models in order to select the most appropriate academic models for our study.

In the second section of this chapter, we focus on academic literature analysing typologies of MNC subsidiaries that define ‘strategic’ and ‘less strategic’ subsidiaries. This is especially important for us in that it is vital to our study to distinguish between ‘strategic/centres of excellence’ and ‘less strategic’ foreign MNC subsidiaries in Japan. We have paid special attention to ‘centres of excellence’ (Frost, Birkinshaw and Ensign, 2002) and the ‘competence creating subsidiary’ (Cantwell and Mudambi, 2005) because these
two academic studies divide MNC subsidiaries into two types, whereas other major studies focus on a four-type classification. Because our study required a clear distinction between 'strategic/centres of excellence' and 'less strategic' non-Japanese MNC subsidiaries in Japan, these two academic studies better suited our purpose.

In the third section of this chapter, we review literature that discusses the essential elements and independent variables that combine to form strategic MNC subsidiaries such as ‘centres of excellence’. In order to precisely analyse the impacts of independent variables on the formation of ‘centres of excellence’, we have identified each independent variable by referring to several key studies such as ‘Centres of excellence’ (Frost, Birkinshaw, and Ensign, 2002), ‘Competence creating subsidiary’ (Cantwell and Mudambi, 2005), and ‘Knowledge flow in multinational companies’ (Gupta and Govindarajan, 2000).

2. Overview of development of studies on MNC overseas subsidiaries

Together with ‘Business network theory’, ‘differentiated network theory’ (Ghoshal and Nohria, 1989) is considered one of the most influential academic research streams on MNC strategy. We have based our research on ‘Business network theory’, but before turning to in-depth analysis of this study, we will first focus on the academic literature on ‘Differentiated network theory’ in order to articulate discussion points and highlight the strengths of ‘Business network theory’.

Ghoshal and Nohria (1989) have classified MNC subsidiaries into four types based on ‘Local resources’ and ‘Environmental complexity’. They analyze the relationships between these four types of MNC subsidiaries and ‘Centralization’, ‘Formalization’, and ‘Socialization’ as we can see in chart 2-2-1. They measure ‘Environmental complexity’ in terms of local competition and technological dynamism, and ‘Local resources’ in terms of factors such as technology, capital and managerial resources. For ‘Centralisation’ this is measured by subsidiary autonomy; ‘Formalisation’ is measured in terms of MNC internal policies and systems formalization; and ‘Socialisation’ is measured by how much MNC subsidiaries are in line with parent companies’ values and goals.

As we can see in chart 2-2-1, Ghoshal and Nohria discovered that MNC subsidiaries designated high ‘Environmental complexity’ and ‘Local resources’ have low ‘Centralisation’, moderate ‘Formalisation’, and high ‘Socialisation’. Thus we can infer that these MNC subsidiaries have strong ‘Autonomy’, moderate ‘Integration into the MNC system’, and strong ‘sharing with MNC HQ values and goals’.
Bartlett and Ghoshal, the leading researchers of 'Differentiated network theory', are considered the first international business strategy researchers to develop the concept of the MNC as an inter-organisational network through the analysis of nationality, ownership, and boundaries, enabling us to bridge our understanding of international MNC activities and inter-firm relationships (Giroud and Scott-Kennel, 2009). To clarify and classify global MNC group global activities, Bartlett and Ghoshal (1989) have developed what they call 'Transnational theory'. At first, they categorize existing MNC companies into three types, as we can see in chart 2-2-2. The 'Multinational' type of MNC is represented by Unilever, Phillips, and ITT; the 'Global' type of MNC is represented by Kao, Matsushita, and NEC; the 'International' type of MNC is represented by P&G, GE, and Ericsson. They claim that the 'Multinational' type of MNC (Unilever & Phillips) originated mainly in Europe, the 'Global' type of MNC (Matsushita & NEC) originated mainly in Japan, and the 'International' type of MNC (PG & GE) originated mainly in the US.
Bartlett and Ghoshal (1998) categorize the three types of MNC by focusing on three criteria (2-2-3). The key classification is based on ‘Configuration of assets and capabilities’.

According to Bartlett and Ghoshal, ‘Multinational’ type MNCs tend to be more ‘Decentralised and nationally self sufficient’, meaning that they give more autonomy to their overseas entities. Thus, ‘Multinational’ type MNC subsidiaries tend to have more autonomy to sense and exploit local opportunities. As a result, knowledge can be developed and retained within each unit. ‘Global’ type MNCs tend to be more ‘centralised and globally scaled’ as we can observe from most Japanese MNC subsidiaries. These ‘global’ type MNC subsidiaries have less autonomy. As they concentrate on implementing parent company strategies, knowledge develops only at the centre and is retained there. ‘International’ type MNCs lie between ‘multinational’ type and ‘global’ type MNCs. Sources of core competencies are centralised but others are decentralised, and thus these MNC subsidiaries can adapt and leverage company competences, and knowledge develops at the centre and is then transferred to other overseas units.
We can observe two key strengths of the ‘Transnational’ model which are of benefit to our study. First, Bartlett and Ghoshal not only categorize MNCs based on overall strategy but also on the roles of the MNC’s subsidiaries as well. In other words, they connect the global strategy of a given MNC with a MNC subsidiary typology. This is important for our study. Although we focus on the activity of foreign MNC subsidiaries in Japan, these activities cannot be isolated from a given MNC’s global group strategy. Second, they have designated the ‘Transnational’ type as the ideal / target model for MNCs and define its characteristics clearly, citing how the three more conventional types of MNCs can be transformed to ‘Transnational’ MNCs. As our study also focuses on how to identify ‘strategic’ and ‘less strategic’ MNC subsidiaries in Japan and to clarify their differences, the implications of the work of Bartlett and Ghoshal are quite significant for us.

As we can see from chart 2-2-4, the ‘transnational’ MNC, which Bartlett and Ghoshal (2002) cite as the ideal MNC structure, is structured not on conventional HQ-Subsidiary lines but more as an interconnected network. The ‘transnational’ MNC has a dispersed and specialised structure. Thus, the roles of a given MNC’s overseas subsidiaries are differentiated but integrated globally, and knowledge is developed and stored globally.
However, Forsgren, Holm, and Johanson (2005), who are the key researchers of the ‘Business network theory’ are critical of ‘Differentiated network theory’. They claim that Ghoshal and Bartlett focus too much on the differences between internal parts of MNCs rather than on MNC subsidiaries’ relationships with entities outside of the MNC’s organizational structure (chart 2-2-5).
Forsgren, Holm, and Johanson (2005) state that relationships within the network are above all business relationships associated with resource interdependencies. Thus, different units exchange resources with each other because they are linked to each other through their own business activities. They assume that these MNC subsidiaries' activities have evolved over time to exchange broader resources and capabilities beyond the MNC's organizational boundaries.

‘Business network theory’ scholars see the relationships of different organizational units with external customers, suppliers, and competitors—that is, their ‘embeddedness’ or their ‘linkages’—as crucial points. Forsgren, Holm, and Johanson (2005) state that relationships within the MNC cannot be understood without an explicit analysis of the relationship of different organisational units with their external customers, suppliers, competitors, and so on. Frost, Birkinshaw, and Ensign (2002) have also focused on the nature and strength of these MNC subsidiaries’ linkages with their respective local business environments.

Therefore, we can infer that the ‘Business network theory’ covers and analyses a much broader range of elements around MNC subsidiaries’ activities than those of the
‘Differentiated network theory’.

Criticism has been directed at the ‘Differentiated network theory’ from a different viewpoint as well. Rugman and Verbeke (1989) point out that MNCs have most of their assets and sales within their home region; they are in need of regional, not transnational strategy or structure. They point out that the ‘MNC can use its specific combinations of non-location-bound firm-specific advantages and location-bound firm-specific advantages as strategies to achieve an optimal resource deployment across borders.’ (Rugman and Verbeke, 1992, 2001, 2003). They also claim that MNCs are very nationally responsive in various countries, as multinational firms derive their strengths mainly from location-bound firm-specific advantages (not from firm-specific advantages) embedded in their subsidiaries. Rugman and Verbeke (1989) observe that the main weakness of the transnational solution model is its underlying hypothesis that ‘firms have widely dispersed assets and sales, and can become global industry leaders only by building upon their existing administrative heritage and complementing this with capabilities from other MNC archetypes, focusing on socialization at the expense of organizational structure to achieve coordination and control of their internal network, and simply managing their national subsidiaries as a set of interdependent businesses.’

For this study, we have based our framework mainly on the ‘Business network theory’. This is mainly because the prime purpose of our study is to identify ‘centres of excellence’ among foreign MNC subsidiaries in Japan, and identifying the key factors leading to the formation of centres of excellence. Thus, by utilising ‘Business network theory’, we can identify more factors associated with the formation of centres of excellence from a wider perspective, which will be more productive for MNC managers who would like to form their own centres of excellence in the Japanese market. As Birkinshaw and Pedersen (2008) state, subsidiary-level research has shifted its centre of gravity towards network conceptualisation; we posit that ‘Business network theory’ can be considered part of the ‘subsidiary development stream’ detailed in chart 2-2-6.
In the initial stages of MNC academic research, Fouraker and Stopford (1968) and Stopford and Wells (1972) analysed MNC strategy and structural relationships using schemes such as the ‘mother-daughter structure’, and ‘the international division structure’. This early MNC research stream is referred to as the ‘strategy-structure stream’ in chart 2-2-6. The connection between strategy and structure in large corporations grew out of early work on organizational theory, with a key concern being more flexible structures as alternatives to the traditional hierarchy (Paterson and Brock, 2002). The strategy-structure stream focuses on the whole MNC structure but is based on a hierarchical viewpoint, as we can see from chart 2-2-7. Birkinshaw and Pedersen (2008) find that the strategy-structure stream concentrated on understanding why MNCs adopted certain structures such as global product divisions, area divisions, and matrixes. They did not focus much on the convergences in their findings. MNC subsidiaries were not given much attention.
After the strategy-structure stream, the ‘HQ-subsidiary relationship stream’ was presented in Transnational theory by Bartlett and Ghoshal (1989). The ‘Transnational organisation’ was seen as the preferred structure for MNCs, and this concept became one of the dominant schemes of the HQ-subsidiary relationship stream (Paterson and Brock, 2002) as we can see from chart 2-2-6. We can also see from chart 2-2-7 that this stream focuses only partially on the structure of MNCs and is dominated by a hierarchical viewpoint. It assumes that MNC ‘strategy itself was under the control of headquarters and little consideration was given to the resistance the headquarters might face’ (Paterson and Brock, 2002). Thus, the HQ-Subsidiary relationship stream focuses on the centralisation and formalization of decision-making (Gates and Egelhoff, 1986, Hedlund, 1981). However, this stream was also willing to accept the idea that subsidiaries might have considerable autonomy and influence (Paterson and Brock, 2002), and that formal control mechanisms might have been growing harder to enforce (Kim and Mauborgne, 1993). Following this, headquarters’ power over the subsidiary would gradually deteriorate and headquarters would eventually try to reassert control (Forsgren, Holm, and Johanson, 1995, Ghauri, 1992). According to Birkinshaw and Pedersen (2008), the ‘HQ-subsidiary relationship stream’ was the first business academic wave to give explicit attention to MNC subsidiaries, and the main focus of this stream was on the ‘centralization and formalization of decision-making, and approaches to coordination and integration across the portfolio of subsidiaries.’

The subsidiary role stream follows the HQ-subsidiary stream, as we can observe from chart 2-2-6. Paterson and Brock point out that the emphasis is no longer on MNC subsidiary as a unit of analysis; rather, this stream understands headquarters as an external factor, allowing researchers to look at the various strategic roles of those subsidiaries. This stream has explicitly focused its analysis on the MNC subsidiary (Birkinshaw and Pedersen, 2008). As we can see from chart 2-2-7, the subsidiary role stream views subsidiaries more from the network point of view than from the hierarchical point of view, but still includes some MNC-dominated points.

The MNC subsidiary can be classified in various ways. In Birkinshaw and Pedersen’s (2008) analysis, the subsidiary is classified based on the scope of its activities (White and Poynter, 1984). It can also be classified based on its knowledge (Birkinshaw and Morrison, 1995, and Bartlett and Goshall, 1996), or on the degree of its global and local integration (Jarillo and Martinez, 1990). These trends have emerged as part of the MNC subsidy role stream.
Following the above developments, the focus has shifted to the emergence of strategic MNC subsidiaries, and analyses such as ‘Centres of excellence’ (Frost, Birkinshaw, and Ensign, 2002), and the ‘Competence creating subsidiary’ (Cantwell and Mudambi, 2005) have come to predominate.

We have reviewed how MNC academic studies have been developed, and which academic framework is most suitable for this study. As we said earlier, we will focus on ‘Business network theory’ in order to have a bigger picture of how MNC subsidiaries are connected and how they influence each other and other entities. The next section will focus on a discussion of MNC typology, and on how we can identify key factors in the formation of centres of excellence.

3. Overview of studies on MNC subsidiary typology

As we observed above, as the MNC research stream reaches the ‘subsidiary role stream’, many approaches to subsidiary classification have emerged in the business strategy academic arena.

[Chart 2-3-1: Transnational model: Strategic roles of national subsidiaries]

```
+----------------+------------------+
|                |                  |
| High           |                 |
| Strategic      | Strategic        |
| importance     | leader           |
| of local       |                  |
| environment    |                  |
| Low            |                  |
| Low            | High             |
| Level of local |                  |
| resources and  |                  |
| capabilities   |                  |
```

Source: Bartlett and Ghoshal (1986, P323)

Bartlett and Ghoshal (1986) categorise MNC subsidiaries into four types based on two variables: ‘strategic importance of local market’ and ‘capability of local subsidiary’. They point out that the ‘Strategic leader’, the most competent MNC subsidiary type, is a national organisation (subsidiary) with ‘high internal competence’ located in a ‘strategically important market’. The ‘Strategic leader’ must be a legitimate partner with headquarters in developing and implementing broad strategic thrusts. In addition to ‘detecting early warning signals for change’, ‘they must fully participate in analysing the resulting threats
and opportunities and developing appropriate organisational responses. Although the variables for classification are different, the ‘Centre of excellence’ as defined by Frost, Birkinshaw, and Ensign (2002) and the ‘Strategic leader’ as defined by Bartlett and Ghoshal (1986) have much in common as both of them are seen as the most competent type of MNC subsidiary.

The ‘Contributor’ describes a subsidiary ‘trying to capture the benefits of certain local facilities or capabilities and apply these to the broader worldwide operations.’ The ‘Implementer’ describes a subsidiary ‘having just enough competence to maintain its local operations in a non strategic market. It is characteristic of many subsidiaries in the developing countries such as in Africa.’ The ‘Black hole’ is a subsidiary in a strategically important market such as US, Europe, or Japan which is incompetent to meet the MNC’s expectations (Bartlett and Ghoshal, 1986). Bartlett and Ghoshal (1986) clearly state that the ‘Black hole’ is not a strategically acceptable subsidiary under any conditions within an MNC.

[Chart 2-3-2: Jarillo and Martinez model: Strategic roles of national subsidiaries]

Another influential study on MNC subsidiary classification by Jarillo and Martinez (1990) has also categorised MNC subsidiaries into three types based on ‘Degree of integration’ and ‘Degree of localisation’ criteria (chart 2-3-2). ‘Degree of integration’ means how well the applicable subsidiaries are integrated into the larger MNC. They call the most well localised and integrated MNC subsidiaries ‘active subsidiaries’. As regards a subsidiary’s ‘Degree of localisation’, Jarillo and Martinez claim that well integrated subsidiaries would be likely to have more influence in the internal MNC network, thus gaining more recognition from HQ and having more access to internal resources. ‘Degree of localisation’ means how well local subsidiaries respond proactively to local market needs. Unlike the
initial Phillips Japan example, these subsidiaries will create and form new trends in local markets. As an example of ‘degree of localisation’, US car companies sold left-hand-drive cars in Japan in spite of the fact that the Japanese drive on the left, so when the German car company Mercedes properly identified market needs and introduced right-hand-drive cars, they quickly succeeded in penetrating the Japanese market.

[Chart 2-3-3: Birkinshaw, Frost, and Ensign model: Centres of excellence]

Frost, Birkinshaw, and Ensign (2002, p997) have defined a ‘centre of excellence’ as ‘an organization unit that embodies a set of capabilities that has been explicitly recognised by the firm as an important source of value creation, with the intention that these capabilities be leveraged by and/or disseminated to other parts of the firm.’

There are several key points to this definition. First, the authors assume that centres of excellence will tend to have a physical presence. Second, centres of excellence represent a focus for a superior set of capabilities supported by both tangible and intangible resources. Tangible assets are assets such as capital investments by the MNC’s parent company. This is an important element, as it helps subsidiaries significantly improve their capacity. Intangible assets are assets such as skills, knowledge, and expertise. Basically, the centre of excellence designates a competent MNC subsidiary which excels in research, development, and manufacturing capabilities (chart 2-3-3). Frost, Birkinshaw, and Ensign (2002) have mainly analysed the effects of the ‘external environment’, ‘external & internal sources of competence’, ‘parent firm investment’, and ‘subsidiary autonomy’ on the creation of ‘centres of excellence’. Academic classifications such as this one tend to focus on the manufacturing sector, as it is more difficult to identify centres of excellence in the service sector. This is because key elements for centres of excellence are likely to emerge in the areas of R&D and manufacturing.
Cantwell and Mudambi (2005) have identified the ‘competence-creating subsidiary’, an MNC subsidiary comparable to the ‘centre of excellence’ as defined by Frost, Birkinshaw, and Ensign (2002) and also to the ‘strategic leader’ as defined by Bartlett and Ghoshal (1986). This classification hinges on ‘whether subsidiaries have reached competence creating mandate or not’ in areas such as ‘sales, service, assembly, manufacturing, product development, international strategy development, and R&D intensity’. Compared with the other studies on MNC subsidiary classifications discussed above, the ‘MNC competence-creating subsidiary mandate’ classification has distinct advantages. Like centres of excellence, the ‘MNC competence-creating subsidiary mandate’ classifies subsidiaries as either ‘Competence-creating subsidiaries’ or ‘Competence-exploiting subsidiaries’. MNC subsidiaries designated ‘competence creating subsidiaries’ are more strategic subsidiaries, while ‘competence exploiting subsidiaries’ are less strategic subsidiaries. Also, the variables that define MNC subsidiaries as ‘competence-creating subsidiaries’ or ‘non competence-creating subsidiaries’ are clearly delineated.

Another MNC subsidiary typology by White and Poynter (1984) classifies the MNC subsidiary as a ‘Miniature replica’, a ‘Product specialist’, or a ‘Strategic independent’ by using ‘product scope’ and ‘market scope’ as variables. The most competent subsidiaries with wide product and market scope classified as ‘strategic independent’ MNC subsidiaries according to this typology could be considered comparable to the ‘centre of excellence’ defined by Frost, Birkinshaw, and Ensign (2002) and the ‘strategic leader’ defined by Bartlett and Ghoshal (1986).

Porter (1986) has also classified MNC subsidiaries. His categories—‘country centred’ strategy subsidiary, ‘purest global strategy’ subsidiary, and ‘complex global’
subsidiary—use ‘coordination’ and ‘configuration’ as the main variables. He classifies the most well coordinated and configured MNC subsidiaries, that is, the most competent MNC subsidiaries, as MNC subsidiaries with ‘complex global strategy’.

As we can see from chart 2-3-5, and as we have observed in this section, many of existing typology studies of MNC subsidiaries such as ‘Strategies for foreign-owned subsidiaries in Canada’ by White and Poynter (1984), the ‘Transnational national model’ of Bartlett and Ghoshal (1986), and ‘Different roles for subsidiaries’ of Jarillo and Martinez (1990) all classify MNC subsidiaries into four categories based on two variables. However, these four categories are not very suitable for us. This is because we aim to distinguish between ‘more strategic players’ and ‘less strategic players’ as we survey MNC subsidiaries in Japan in order to analyse factors associated with forming ‘more strategic players’. In addition, these studies do not include explicit analyses of the relationships of MNC subsidiaries with external customers, suppliers, competitors, and so on (Forsgren, Holm, and Johanson, 2005). Thus, it is more suitable for us to focus on academic studies classifying MNC subsidiaries into two types, such as the ‘Centres of excellence’ model of Frost, Birkinshaw, and Ensign (2002), and the ‘Competence creating subsidiary’ model of Cantwell and Mudambi (2005), in order to clearly define more strategic MNC subsidiaries in Japan.
Finally, it is important to emphasize that in order to identify MNC subsidiary typologies effectively, we should not lose sight of the bigger picture of overall MNC strategy. This is mainly because, according to Birkinshaw and Pedersen (2008), although certain resources and capabilities can be clearly separated between HQ and subsidiaries, other resources and capabilities cannot be so easily classified. For example, for purchasing purposes, a certain MNC subsidiary may be able to procure supplies locally, but another MNC might require that supplies be obtained centrally from HQ. Thus, it is possible to say that MNC typologies are not isolated issues that can be discussed separately, but rather should be discussed as part of an MNC’s integrated network and strategy. In order to keep our focus on overall MNC strategy, we will use the frameworks established in ‘Centres of excellence’ (Frost, Birkinshaw, and Ensign, 2002) and ‘Competence creating subsidiaries’ (Cantwell and Mudambi, 2005) for our MNC typology. In the next section we will discuss ...
how to identify the key determinants of centres of excellence.

4. Determinants of centre of excellence creation

Centres of excellence are classified as more competent MNC subsidiaries, but determining how to select these more competent MNC subsidiaries from the crowd is crucial. Unless we set applicable and optimised classification criteria, we may end up selecting the wrong MNC subsidiaries as centres of excellence. Setting clear and logical criteria here is important.

Frost, Birkshaw, and Ensign (2002) and Forsgren and Andersson (2000) have both identified criteria for the selection of centres of excellence. As we can see from chart 2-4-1 and chart 2-4-2, both define ‘External embeddedness’ and ‘External environment’ as key criteria for centres of excellence. This is in line with the ‘Business network model’, as they also focus on the importance of MNC subsidiaries’ external linkages.

[Chart 2-4-1: Independent determinants for ‘centres of excellence’]

![Chart 2-4-1]

Source: Table based on Frost, Birkinshaw, and Ensign (2002)

[Chart 2-4-2: Independent determinants for searching for ‘Centres of excellence’]

![Chart 2-4-2]

Source: Table based on Forsgren, and Andersson (2000)

In addition to the points above, Frost, Birkshaw, and Ensign (2002) have referred to the ‘autonomy of the MNC subsidiary’, the ‘parent company’s investment’, and the ‘MNC’s internal sources of competence’ as key criteria for identifying ‘centres of excellence’.
Forsgren and Andersson (2000) argue that the ‘psychic distance of the MNC subsidiary’ and ‘subsidiary size’ are also key elements for defining centres of excellence.

Birkinshaw and Pedersen (2008, p371) argue that recent academic literature sees subsidiary ‘autonomy’ more as input for subsidiary development, rather than as ‘an antithesis of control and an outcome that subsidiaries were striving for’. Cantwell and Mudambi (2005) also note that it is not strategic independence per se that is important, but the manner in which strategic independence is used by the subsidiary in the context of competence-creating mandates. Thus, we can infer that the ‘greater the extent of subsidiary autonomy, the better the ability of the subsidiary to form favourable external network linkages with other companies and institutions in its own local environment’ (Birkinshaw et al., 1998; Andersson and Forsgren, 2000) in order to become more strategic subsidiaries within the MNC group. White and Poynter (1984) have identified ‘strategic independent’ subsidiaries; that is, the most competent MNC subsidiaries based on how much these subsidiaries could expand ‘value added scope’ and ‘market scope’ for the MNC. Taggart (1998) has also classified competent MNC subsidiaries partly based on how much market scope the MNC subsidiary has. However, as we can see from the section on ‘autonomy’, it is also possible to say that ‘scope expansion’ of a given MNC subsidiary may materialise only when MNC gives it the freedom to do so. The ‘subsidiary-driven charter extension process actually requires the foreign subsidiary to have considerable autonomy in terms of the ability to identify and pursue interesting market opportunities without explicit permission from the parent company’ (Frost, Birkinshaw, and Ensign, 2002). Therefore, it is important for us to note that ‘autonomy’ will only become effective in forming ‘centres of excellence’ when MNC subsidiaries use ‘autonomy’ wisely and effectively to improve their access to ‘resources’ and ‘capabilities’.

(Birkinshaw, Pedersen, 2008)

We formulated the following hypothesis:

**Hypothesis 1:** ‘The greater the subsidiary’s autonomy, the higher its likelihood of becoming a centre of excellence’.

HQ investment in MNC subsidiaries may also be an important factor in the formation of centres of excellence, as it is very difficult for many foreign MNC subsidiaries to gain access to financial resources by themselves. This can be observed from the fact that most subsidiaries of foreign MNC are not publicly listed. Dierickx and Cool (1989), Barney (1991), and Birkinshaw and Hood (1998) have confirmed that the sustained parent-driven...
investment is important in developing the competitive advantage of MNC subsidiaries through developing capabilities and positions in local markets. Birkinshaw and Hood (1998) have also identified parent driven investment as one of the classic processes through which subsidiaries develop capabilities, thus forming the basis for a given subsidiary’s expanded role and position within MNC. Subsidiaries performing well in their role as centres of excellence may be rewarded by the parent company with additional investment.

However, once MNC subsidiaries are formally recognized as centres of excellence, they may be forced to give up some of their autonomy as the parent company seeks to integrate MNC subsidiaries more tightly into its global network. (Frost, Birkinshaw, and Ensign, 2002) Although this is an important and timely issue, it is only recently that researchers have begun to address the question of ways in which this process of sequential investment from the parent company affects the subsidiary (Birkinshaw and Pedersen, 2008). But, as autonomy was simply one precondition for MNC subsidiaries to become centres of excellence, HQ investment is just another precondition for MNC subsidiaries to improve their capabilities through using investments from HQ wisely in order to improve their performance to get yet more HQ investment. In this sense, HQ investment could be considered to be a cumulative and evolutionary process (Frost, Birkinshaw, and Ensign, 2002). Indeed, it is up to the subsidiary management to utilise the opportunities given, but as Birkinshaw, Hood, and Young (2005) states that the external factor (in terms of MNC subsidiary viewpoint), especially such as HQ investment in the subsidiary to enhance its activities/or competences largely shapes the options of the subsidiary to become a centre of excellence.

We formulated the following hypothesis:

**Hypothesis 2:** ‘The greater the HQ’s investment in the subsidiary to enhance its activities and/or competences, the higher the likelihood of its becoming a centre of excellence’.

Andersson and Forsgren (2000) look at how MNC subsidiaries are embedded in the local market based on the degree to which the product development and production process development of a particular MNC subsidiary are adapted. ‘Subsidiary embeddedness is specifically defined in terms of mutual adaptations in developing production processes and products between a focal subsidiary and a small number of counterparts, mostly customers or suppliers.’ (Yamin and Andersson, 2011, P152) For our study, this can be
seen from the way the Japanese market affects foreign MNC subsidiaries in Japan—especially in terms of their competence development.

For example, when the local market is a competitive place for the relevant subsidiary, it has to improve its efficiency to survive there. Thus, in order to assess the specific market impact on a particular MNC subsidiary, Frost, Birkinshaw, and Ensign (2002) identify the local market's impact based on the viewpoint of suppliers, customers, and the competition.

Bartlett and Ghoshal (2002) have described the way Matsushita has had to reverse its trend toward standardization of global designs; rather than address these designs en masse, it has begun to focus on target groups and respond to differences across markets. ‘Localised R&D is certainly likely to be a crucial element in the ways that creative subsidiaries assert their individualised position within the group's technological scope.’ (Pearce, 1999, P127)

Andersson and Forsgren (2000) have discovered that MNC subsidiaries that are strongly embedded in terms of product and production development are deemed important within the MNC’s interactions with the subsidiary.

In terms of the adaptation of MNC subsidiaries to the Japanese market, Bartlett and Ghoshal (2002) have stated that to be successful in the Japanese market, it is essential for MNC subsidiaries to lead the new products development through the strategic initiative by deeply understanding the Japanese market.

We formulated the following hypothesis:

Hypothesis 3-a: ‘The higher the degree of a subsidiary’s embeddedness, the higher the likelihood of its becoming a centre of excellence’,

Hypothesis 3-b: ‘The higher the degree of adaptation of the subsidiary to the Japanese market, the higher its likelihood of becoming a centre of excellence’.

The area of subsidiaries’ links to sources of MNC knowledge flow is attracting specific focus from MNC strategy researchers: the primary reason for the MNC’s existence is its ability to use knowledge more effectively and efficiently within its own structures rather than through external market mechanisms, and the recombination of knowledge sourced from different locations is the important function of the MNC (Gupta and Govindarajan, 2000). Thus, it is important for us to see the impact of knowledge flow within the MNC and
its subsidiaries. Sumelius and Sarala (2008) point out that the influences that derive from internal and external knowledge should be viewed together. For internal knowledge flow, they discover that greater flow of knowledge from other MNC subsidiaries is likely to lead to the development of specialized subsidiary knowledge.

[Chart 2-4-3: Gupta and Govindarajan model: Knowledge outflows and inflows]

<table>
<thead>
<tr>
<th>Value of knowledge stock</th>
<th>Knowledge outflows from the subsidiary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivational disposition to share knowledge</td>
<td>Knowledge outflows from the subsidiary</td>
</tr>
<tr>
<td>Existence and richness of transmission channels</td>
<td>Knowledge inflows into the subsidiary</td>
</tr>
<tr>
<td>Motivational disposition to acquire knowledge</td>
<td>Knowledge inflows into the subsidiary</td>
</tr>
<tr>
<td>Absorptive capacity</td>
<td>Knowledge inflows into the subsidiary</td>
</tr>
</tbody>
</table>

Source: Gupta and Govindarajan (2000, P477)

In a study of internal knowledge flow (chart 2-3-5), Gupta and Govindarajan (2000) analyse the factors most strongly associated with knowledge transfer of MNC subsidiaries within their MNC in terms of knowledge inflow and outflow. They assert that only the ‘existence and richness of transmission channels’ (Gupta and Govindarajan, 2000, p475) has a positive impact on both knowledge inflows and outflows of MNC subsidiaries within an MNC. Thus, we can infer that the existence of transmission channels linking MNC subsidiaries is crucial for MNC subsidiary knowledge outflows and inflows within the MNC group.

In terms of external knowledge flow, Sumelius and Sarala (2008) also find that external embeddedness encourages the development of specialized subsidiary knowledge. Their findings show that vigorous internal and external knowledge flow is vital to form more competent subsidiaries within an MNC group.

We formulated the following hypothesis:

**Hypothesis 4:** ‘The stronger the subsidiary’s linkage with internal/external sources of competence, the higher the likelihood of its becoming a centre of excellence’ and
'The higher the level of a subsidiary’s cross functional transmission channel enabling better knowledge flow, the higher the likelihood of its becoming a centre of excellence'.

As we discussed earlier, Jarillo and Martinez (1990) looked at the ‘degree of integration’ of MNC subsidiaries by focusing on how well applicable MNC foreign subsidiaries were integrated into the larger MNC system. Thus, ‘integration’ is the degree to which the MNC subsidiary aligns activities performed within the country with the same activities as performed by the other subsidiaries of the MNC (Jarillo, Martinez, 1990, p503). Thus, they assume that when an MNC subsidiary is more integrated into the rest of the MNC organisation, it is more likely to become a competent subsidiary, as well as achieving a profound degree of localisation. This approach is different from Gupta and Govindarajan’s approach. Jarillo and Martinez focus on actual functional integration such as manufacturing, marketing, and R&D, rather on the structure of information flow.

We formulated the following hypothesis:

**Hypothesis 5:** ‘The greater the subsidiary’s integration in the larger MNC system and the greater the alignment of its activities with the rest of the MNC, the higher its likelihood of becoming a centre of excellence.’

Birkinshaw, Young, and Hood (2005) noted that the ‘Entrepreneurship’ of MNC subsidiaries attracted little direct attention in the academic arena, but argued that this was a crucial factor for MNC subsidiary development, as other responsibilities such as identifying new opportunities and interacting with counterparties in the local market could materialise only when the MNC subsidiary had strong entrepreneurial capability.

There is also an empowerment trend at work in management practice; MNC subsidiary managers are being encouraged to act in a more entrepreneurial manner as MNC subsidiaries are requested to take more initiative and seek new ways of adding value. (Birkinshaw, Pedersen, 2008)

We can infer that an MNC subsidiary which extends its scope through its own entrepreneurial attitude is more likely to become strategic.

Thus, we have formulated the following hypothesis:
Hypothesis 6: ‘The higher the subsidiary’s level of scope expansion, the higher its likelihood of becoming a centre of excellence.’

Location advantage—the advantage of an MNC subsidiary’s industrial location in terms of ‘Porter’s diamond’—is considered crucial for MNC subsidiary development. (Porter, 1990, and Frost, Birkinshaw, and Ensign, 2002). Porter (1990) argues that industrial competitive advantage is based on improvements in productivity and five additional factors: ‘Supplier’s negotiation power’, ‘Client’s negotiation power’, ‘Threats from similar products entry barrier’, ‘New entrants entry barrier’, and ‘Market competitiveness’.

Competence development is initiated by the participation of the subsidiary in the ‘community of practice’, and the strength and dynamism of a particular location provides opportunities for MNC subsidiaries to earn benefits from that location. (Frost, Birkinshaw, and Ensign, 2002) The primary function of a more strategic MNC is to tap into the local knowledge and resource base. (Cantwell and Mudambi, 2005)

We formulated the following hypothesis:

Hypothesis 7: ‘The more competitive the subsidiary’s local market environment, the higher its likelihood of becoming a centre of excellence.’

MNC subsidiary size can be seen as a proxy for its resources and power. (Ghoshal and Nohria, 1989) and Andersson and Forsgren (2002) have analysed the effects of the relative size of MNC subsidiaries on creation of centres of excellence.

In particular, larger and more established subsidiaries are more likely to become centres of excellence (Frost, Birkinshaw, and Ensign, 2002), as we can infer that they are more likely to have access to resources and power in comparison with smaller MNC subsidiaries.

We formulated the following hypothesis:

Hypothesis 8: ‘The larger the subsidiary’s size, the higher its likelihood of becoming a centre of excellence.’
We have formulated five hypotheses about the formation of centres of excellence (chart 2-4-4). Following Cantwell and Mudambi (2002), we can infer that Hypothesis 1 (autonomy level) is determined at the subsidiary level; Hypothesis 2 (parent company investment) is determined at the head office level; Hypothesis 3 (embeddedness and adaptation to the Japanese market) is determined at the local level; Hypothesis 4-1 (external and internal linkage) is determined at the local level; Hypothesis 4-2 (Cross functional transmission channel setting) is determined at the head office level; Hypothesis 5 (Integration with the rest of the MNC) is determined at the head office level; Hypothesis 6 (entrepreneurship / scope expansion) is determined at the subsidiary level; Hypothesis 7 (local market competitiveness) is determined at the local level; and Hypothesis 8 (subsidiary size) is determined at the subsidiary level.

After reviewing the key academic literature on determinants forming centres of excellence, we decided to form our own independent variables for centres of excellence based mainly on Frost, Birkinshaw, and Ensign’s ‘centres of excellence’ (2002) study, as it covers much of the ground for our analysis. We will enumerate and review several points referring to the other academic literature as well. These details will be discussed in the next chapter when we discuss research methodology and design.

5. Summary
As a basis for our study, we have decided to focus more on the ‘Business network view theory’ (Forsgren, Holm, and Johanson, 2000) than on the ‘Differentiated network view theory’ (Ghoshal and Nohria, 1997). There are two key points in this analysis to consider.
First, as Forsgren, Holm, and Johanson (2000) state, the ‘power structure in the MNC is dependent on the network of resource interdependencies, meaning power flows to units and people who control resources and capabilities, irrelevant of their hierarchical position’; second, ‘Relationships with MNC cannot be grasped without an overview of the relationships enjoyed by different organisational units with external customers, suppliers, and competitors’.

The above points are crucially important for us. We believe it is important to analyze the factors that make it possible for MNC subsidiaries to become more strategic not only by focusing on factors within the MNC’s formal organizational structure, but also on factors associated with the external networks/linkages that MNC subsidiaries possess. It is also consonant with the main goals of this thesis: to identify more strategic MNC subsidiaries in Japan while at the same time considering the impact of Japanese local markets on the creation of strategic subsidiaries.

Most of the MNC typology studies we looked at focused on classifying MNC subsidiaries into four types. This is not fully in line with the aim of our study. We aim to classify MNC subsidiaries into just two types: ‘more strategic MNC subsidiaries’ and ‘less strategic MNC subsidiaries’. This is why we have selected ‘Centres of excellence’ (Frost, Birkinshaw, and Ensign, 2002) as the basis for our two-type MNC subsidiary classification. There are several additional reasons why we have chosen centres of excellence as our model. First, the centres of excellence model aims to identify the effects of local external factors outside of the MNC’s organizational structure on the formation of centres of excellence. We selected the business network view model over the differentiated network view model because the ‘former identifies factors influencing MNC subsidiary activities beyond its organizational boundaries. Second, the centres of excellence model envisages the impacts of external organizations and market impacts on the creation of centres of excellence. Even from this perspective, retaining the basic framework of the business network view model and identifying more competent MNC subsidiaries using the centres of excellence model make our research framework more robust.
[Chapter 3: Research methodology & design]

1. Introduction

In this chapter, we will discuss how we have refined our methodology and how we have collected relevant data to both identify centres of excellence among MNC subsidiaries in Japan and investigate the establishment of those centres of excellence. As we have discussed in the literature review in chapter 2, we constructed our research methodology based on Frost, Birkinshaw, and Ensign’s centres of excellence model, and reinforced this with other relevant studies where necessary.

In the second section of this chapter, we review two major approaches for academic research: the ‘quantitative approach’ and the ‘qualitative approach’. We discuss the strengths and weaknesses of quantitative and qualitative approaches and explain the merits of the quantitative approach for our study. Most of the notable studies in the field have also taken the quantitative approach.

In the third section of this chapter, we discuss how we collected the necessary information on foreign MNC subsidiaries in Japan and how we set up criteria to identify foreign subsidiaries, as some of those subsidiaries had equity participation from Japanese companies. After these clarifications, we review how we selected the applicable MNC subsidiaries that are the targets of our study. As the availability of information about foreign MNC subsidiaries in Japan is quite limited, it was important for our study to identify appropriate data sources and analyse them appropriately.

The fourth section of this chapter gives details about how we set the actual questions for the questionnaire. In order to clarify the hypotheses we discussed in chapter 2, we explain how we set questions to identify centres of excellence (dependent variables) and the factors necessary to establish centres of excellence (independent variables) by referring to major studies.

In the fifth section, we review how we conducted a pilot survey by using a pilot questionnaire. This pilot study was conducted in order to optimise our questionnaire and our actual survey for data collection.

In the sixth section, we explain how we conducted the survey by sending questionnaires to applicable foreign MNC subsidiaries in Japan, and what kind of data we were able to collect. We also identify some problems with our methodology.
The final section of the chapter concludes with challenges presented by the composition of the questionnaire and the data collection we conducted for this study.

2. Quantitative and qualitative approaches

Before we start the discussion of our research methodology and design, it is necessary for us to go through an overview of academic research frameworks. For academic research, there are mainly two research methods: the quantitative approach and the qualitative approach. However, the distinction between the two is often ambiguous (Bryman, 2001) and clarification of the research approach is important for a successful study.

According to several scholars who have studied research approaches such as Yin (2002), Hakim (1987), and Bryman (2001), the strength of qualitative approach is that it yields in-depth data through methods such as face-to-face interviews. The weakness of this method is that it is difficult to get objective data for the kind of regression analysis which we aim to conduct.

For instance, when conducting qualitative interviews, the person asking questions could change the content slightly, which would lead to information bias. As it is more time-consuming, it is also difficult to get large amounts of data. Therefore, we can imply that, compared with a quantitative approach, a qualitative approach has the following drawbacks: 1) the sample size must be drastically limited compared with quantitative approaches such as mail surveys, as the qualitative approach often needs to be done through face-to-face interviews, and 2) it is difficult to find a clear correlation between centres of excellence and relevant elements found from the survey.

As the main purpose of this study is to identify centres of excellence through investigating a larger sample and to identify clear correlations between centres of excellence and relevant elements found from this survey, we decided to use a questionnaire with predetermined questions rather than open-ended questions. Creswell (2003) specifies that the predetermined questionnaire is better suited to the quantitative approach. We reached the conclusion that the quantitative approach was the most applicable approach for us.

After reviewing major studies conducted by Yin (2002), Hakim (1987), and Bryman (2001), we identified two ways to collect data. The first is to use the kind of secondary data collected and archived by Government agencies. The strength of this approach is that it is
very easy to obtain this type of data compared with the collection of primary data. Also, most of these types of data are objectively measured.

Nonetheless, the objectives for the collection of such secondary data is not often in line with the research we are conducting, as government agencies often collect data for their own purposes. Unfortunately, this was true for our study; we were not able to get the information we needed from secondary data although we intensively surveyed available government-level data through checking JETRO, METI, and various other Japanese government databases and libraries. It was difficult for us to get the exact information we needed even when we did have access to this kind of government data.

The second type of quantitative approach is to collect primary data through interviews and to conduct certain analyses on that data based on the project’s aims. The strength of collecting primary data is that it is made it possible for us to collect data appropriate for the classification of MNC subsidiaries as centres of excellence or non-centres of excellence and to identify the exact factors which went into making those MNC subsidiaries centres of excellence.

Nevertheless, there are some drawbacks to this kind of primary data collection. There is time and expense associated with collecting the applicable data. Furthermore, depending on the respondents’ motives, some answers may lack objectivity or may deviate from the truth. Therefore, it was vital for this study to get objective data for the comparisons that are essential for research methods we wanted to use, such as regression analysis. We tried to formulate our questionnaire to elicit objective answers.

Despite these drawbacks, we decided that it was more appropriate for us to use a quantitative approach and to collect primary data rather than using a qualitative approach, as our project focused more on exhibiting relationships between our hypotheses and research results obtained through the collection of numerical data by means of a closed-end questionnaire (chart 3-2-1).
### Chart 3-2-1: Comparison between Qualitative and quantitative approach

<table>
<thead>
<tr>
<th>Research approach</th>
<th>Qualitative approach (Bryman, 2001)</th>
<th>Quantitative approach (Bryman, 2001)</th>
<th>Objectives of our study</th>
</tr>
</thead>
</table>
|                   | 1) Survey mainly based on open-ended questions  
2) Tends to be concerned with words rather than numbers  
3) Inductive view of the relationship between theory and research | 1) Survey mainly based on closed-ended questions  
2) The collection of numerical data  
3) Exhibiting the relationship between theory and research  
4) Having an objectivist conception | 1) Survey mainly based on closed-ended questions  
2) The collection of numerical data  
3) Exhibiting the relationship between theory and research |


### 3. Building a company list for data collection

Generally, it is extremely difficult to obtain even basic information about foreign MNC subsidiaries in Japan. First, there are not so many publishers in this area, and second, these subsidiaries are often not listed on the Japanese stock market, so they are not required to make this kind of information public.

Nonetheless, Toyo-Keizai, one of the most prestigious economic magazine publishing companies in Japan, issues yearly updated data on 3,310 major subsidiaries of non-Japanese MNCs in Japan. We used this database as the basis for our survey.

According to a JETRO survey made in 2008 based on Toyo-Keizai-listed MNC subsidiaries, MNC annual sales in 2006 were ranged as follows. For European MNC subsidiaries, 44.6% had less than 10 million JPY sales, 33.2% had 10-100 million JPY sales, and 11.9% had 100-1,000 million JPY sales. For US MNC subsidiaries, 35.1% had
less than 10 million JPY Sales, 35.7% had 10-100 million JPY sales, and 12.1% had 100-1,000 million JPY sales. It is possible to say that European MNCs tend to have smaller MNC subsidiaries.

JETRO (2008) also surveyed the sectors of MNC subsidiaries in Japan for 2006: 54.4% were in the manufacturing sector and 34.6% were in the service sector.

In terms of the home countries of MNC parent companies, JETRO (2008) found that 37.3% originated in North America, 42.8% originated in Europe, and the rest were from various locations around the globe. They concluded that most MNC subsidiaries in Japan were from North America and Europe.

To build up a company list, we started by identifying target companies to which we would mail our questionnaires. As the aim of the study was a survey identifying centres of excellence in the manufacturing sector, all non-manufacturing related companies were omitted from the list. The main reason for selecting the manufacturing sector is that the existing academic selection criteria for centres of excellence is based on the manufacturing sector, and it is difficult to apply these criteria to other industries. Frost, Birkinshaw, and Ensign (2002) also claim that it is wise to focus research attention on the two primary activities of R&D and manufacturing, as it is within these two areas that centres of excellence are particularly likely to emerge. They also claim that for the service sector, it is much less clear where centres of excellence might emerge.

Second, it was important to define what was meant by a ‘non-Japanese MNC’. According to survey of major Japanese institutions such as JETRO, an MNC 33.3% of whose stock is owned by non-Japanese companies or organisations is defined as a non-Japanese MNC. Thus, we selected target companies based on this definition. Using these criteria, we identified 1,388 foreign MNC subsidiaries in Japan as targets for our research. The range of mother company nationalities is recorded in chart 3-3-1. Please note that only North American and European MNC subsidiaries were selected for this survey as our research was aimed at North American and European MNC subsidiary activities in Japan.
4. Designing and formulating the questionnaire

The main purpose of collecting data through sending questionnaires to foreign MNC subsidiaries in Japan was to classify centres of excellence among foreign MNC subsidiaries and clarify the key factors necessary to form those centres of excellence. Thus, before starting to design the questionnaire, it was important for us to identify here once again where we needed to focus by identifying the hypotheses we laid out in chapter 2. Thereafter, we discussed questions for the questionnaire that would help articulate dependent variable (centres of excellence) and relevant independent variables.

First, we needed to identify the criteria for centres of excellence. For this purpose, we went through relevant literature to identify the appropriate questions.

Secondly, as we set hypotheses regarding ‘autonomy’, ‘scope expansion’, ‘HQ investment’, ‘links to internal competence’, ‘knowledge flow’, ‘embeddedness’, ‘level of integration’, and ‘Japanese market impact’, we reviewed the key academic literature to articulate our questions in the questionnaire. In addition to ‘autonomy’, we also analysed ‘entrepreneurial
culture’ in order to assess the subsidiary competence necessary to achieve ‘autonomy’. A detailed discussion of each of these issues appears below.

Finally, for the scale of reply, although several researchers such as Frost, Birkinshaw, and Ensign (2002) use a 1-7 scale (where 1 is the lowest value and 7 is the highest) for responses, Bell (2005) states that for Likert scales, three, five, or seven-point ranges are generally used. We selected a 1-5 scale, as we did not want the responses to be too ambiguous.

**Dependent variable: Centres of excellence**

[Chart 3-4-1: Comparison of academic literatures / Centres of excellence]

<table>
<thead>
<tr>
<th>Centres of excellence</th>
<th>MNE Competence creating subsidiary mandate (Cantwell and Mudambi 2005)</th>
<th>Different roles for subsidiaries: The case of multinational corporations in Spain (Jarillo and Martinez, 1990)</th>
<th>Subsidiary entrepreneurial, internal and external competitive forces, and subsidiary performance (Birkinshaw, Hood, and Young 2005)</th>
<th>Our study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centre of excellence</td>
<td>Frost, Birkinshaw, and Ensign, 2002)</td>
<td>Strategy shift in MNC subsidiaries (Taggart 1998)</td>
<td>Categorize the following on a scale of 1-5:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Categorized as 1. sales and service, 2. assembly, 3. manufacturing, 4. product development, 3. international strategy, development. A competence mandate is operationalized as a subsidiary whose output mandate rates either 4 or 5.</td>
<td></td>
<td>A. Positive influence to other foreign affiliated firm(s) &amp; HQ</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Active subsidiary is one with a high degree of integration and a high degree of localization. Mostly subsidiaries of transnational firms.</td>
<td>1. Age of subsidiary 2. Export intensity 3. Level of production complexity (1-3: Assembly only, 5: Fully fledged manufacturing) 4. Nature of R&amp;D (1: None; 6: Generation of new technology for corporate parent) 5. Extent to which marketing activity is coordinated with the internal network 6. Extent to which the subsidiary develops competitive advantage to the market needs of sister subsidiaries 7. Extent to which risks and incentives are spread around the internal network 8. The extent to which purchasing activities is centralized at HQ (above items scored on a scale of 1-5) (Above items scored on a scale of 1-5)</td>
<td>B. Recognition by HQ</td>
<td></td>
</tr>
</tbody>
</table>

‘A centre of excellence is an organizational unit that embodies a set of capabilities that has been explicitly recognized by the firm as an important source of value creation, with the intention that these capabilities be leveraged by and/or disseminated to other parts of the firm.’ (Frost, Birkinshaw, and Ensign, 2002, P1000)

Frost, Birkinshaw, and Ensign (2002) identified centres of excellence and non-centres of excellence through evaluating subsidiary competence in research, development, and manufacturing from 1) the subsidiary’s own perspective, 2) the MNC HQ’s perspective, and 3) the perspective of positive impacts the subsidiary has made on the rest of the MNC.
Cantwell and Mudambi (2005) have taken a similar approach and classified the competence creating subsidiary and the non-competence creating subsidiary based on the degree of product development and international strategy development mandates. Although their criteria differ, we can say that both Frost, Birkinshaw, and Ensign (2002) and Cantwell and Mudambi (2005) classify MNC subsidiaries as more competent MNC subsidiaries and less competent MNC subsidiaries.

By contrast, Jarillo and Martinez (1990) identify active subsidiaries/most competent subsidiaries by classifying subsidiaries in terms of degree of integration within the rest of the MNC and the degree of localisation within the community. They argued that if the subsidiary registers high on both of these scales, it is likely to become an active subsidiary—which is more or less equivalent to a more competent MNC subsidiary from the point of view of Frost, Birkinshaw, and Ensign (2002) and Cantwell and Mudambi (2005). However, Taggart (1998) has been critical of Jarillo and Martinez's approach. Although Jarillo and Martinez classified active subsidiaries by looking at the degree of integration into the rest of MNC and the degree of localisation, Taggart changed the criterion degree of localisation to degree of responsiveness.

We have basically combined the approaches of Frost, Birkinshaw, and Ensign (2002) and Cantwell and Mudambi (2005) to classify our MNC subsidiaries as centres of excellence or non-centres of excellence as chart 3-4-1 shows. This is mainly because these approaches classify MNC subsidiaries as more strategic subsidiaries and less strategic subsidiaries, which meets the needs of our study. We identified centres of excellence by asking the responding subsidiaries to evaluate their own competence mainly in such areas as research, development, and manufacturing in terms of 1) positive impacts on the rest of the MNC, 2) recognition by HQ, and 3) recognition by other MNC subsidiaries, as shown in chart 3-4-1.

**Independent variable: Autonomy**

Frost, Birkinshaw, and Ensign (2002) define ‘autonomy’ as the ability to identify and pursue interesting market opportunities once they identify them without having explicit permission from the parent company. Autonomy gives the subsidiary certain decision-making power to make quick decisions in order not to miss opportunities.

According to Cantwell and Mudambi (2005), recent literature on MNC subsidiaries
suggests that the greater the degree of MNC subsidiary autonomy, the higher the likelihood that they will form stronger external competent networks and thus become centres of excellence.

Thus, our study hypothesis is that ‘The higher a subsidiary’s autonomy, the higher its likelihood of becoming a centre of excellence’.

Frost, Birkinshaw, and Ensign (2002), Cantwell and Mudambi (2005), and Taggart (1998) all identify and measure autonomy intensively, where autonomy is defined as the decision-making power the parent company gives an MNC subsidiary.

As we can see in chart 3-4-2 in the appendix, many key researchers such as Frost, Birkinshaw, and Ensign (2002), Cantwell and Mudambi (2005), and Taggart (1998) refer to ‘top management HR related issues’, ‘new market entry’, and ‘product development’ as key areas in which autonomy may be exercised. We have mainly incorporated these points as key criteria for identifying the level of a given MNC subsidiary’s autonomy. However, as Cantwell and Mudambi (2005) have already covered the importance of ‘autonomy’ in recent MNC subsidiary studies, we tried to view the autonomy level of MNC subsidiaries from a much broader perspective. Thus we have also incorporated some other perspectives suggested by Birkinshaw, Holm, Thilenius, and Arvidsson (2000) as a way to identify MNC subsidiary autonomy, such as whether the subsidiary is given the authority to select its own suppliers.

**Independent variable: Entrepreneurial culture**

Despite the substantial focus on innovation and initiative in MNC subsidiaries, the area of MNC subsidiary entrepreneurship has received rather little direct attention, as Birkinshaw, Hood, and Young (2006) have pointed out. Studying the culture of MNC subsidiary entrepreneurship is very important because even if an MNC subsidiary has autonomy, failing to utilise that autonomy by developing an entrepreneurship culture will keep the subsidiary from becoming a more competent MNC subsidiary or a centre of excellence. Thus, we decided to investigate the effects of entrepreneurship on the creation of centres of excellence.

Birkinshaw, Hood, and Young (2006) analysed the degree of entrepreneurship exercised by an MNC subsidiary by identifying the level of expansion of the overall scope of work of the subsidiary in areas such as R&D, purchasing, manufacturing, sales, and after sales
service over the last three years. We followed these measurements to analyse the culture of entrepreneurship in MNC subsidiaries.

**Independent variable: Subsidiary links to sources of MNC internal and external competence and knowledge flow**

The internal links between MNC subsidiaries and sources of MNC internal competence are crucially important, as these internal network linkages make it easier for an MNC subsidiary to coordinate its activities on a global basis. They also represent an important source of intangible knowledge flows (Frost, Birkinshaw, and Ensign, 2002).

The subsidiary’s external links to sources of external competence are also critically important. A ‘potentially important source of competitive advantage for multinational firms is the capacity of their foreign subsidiaries to generate innovations based on stimuli and resources resident in the heterogeneous host country environments in which they operate’ (Frost, P101, 2001). And to make these MNC internal and external links function effectively, knowledge flows cannot occur without the existence of transmission channels (Gupta, Govindarajan, 2000).

Thus, our study hypotheses are that ‘The stronger the subsidiary’s linkage with internal and external sources of competence, the higher its likelihood of becoming a centre of excellence’, and ‘the higher the level of a subsidiary’s transmission channel level, enabling better knowledge flow, the higher its likelihood of becoming a centre of excellence’.

Frost, Birkinshaw, and Ensign (2002) analyse the level of MNC subsidiary linkage of internal and external sources of competence by looking at the impact of HQ, internal and external customers, suppliers and R&D on the development of core competences. We incorporated these approaches into our study and also tried to evaluate how external sources of competence impacted the development of centres of excellence in terms of customers, suppliers, and R&D. We need to recall that the key difference between the differentiated network view theory and the business network view theory is that the business network view theory also focuses on external linkages of MNC subsidiaries beyond the structural boundaries of its MNC. This area of analysis is a crucial point in our study. By taking this dual approach, we aim to see the impacts of internal and external links to competence on the creation of centres of excellence at the same time. Thus, we assumed that linkages to internal and external sources of competence would be positively associated with the creation of centres of excellence.
Gupta and Govindarajan (2000) assess the level of MNC subsidiary transmission channels by asking subsidiary respondents to indicate the extent to which their subsidiary used ‘liaison personnel’, ‘temporary task forces’, and ‘permanent teams’ to coordinate decisions and actions with sister subsidiaries. This logic is similar to the discussion about autonomy in that the existence of these transmission channels themselves is not as important as the way MNC subsidiaries utilise them; more knowledge should flow within the MNC and contribute to the creation of centres of excellence in the end. As we can see from chart 3-4-4 in the appendix, we followed Gupta and Govindarajan’s (2000) basic approach for the assessment, but to make the questions easier for our respondents to answer, we asked if they had a knowledge-sharing function, whether this was ad hoc or permanent, and also by asking them to specify the regional level for which these functions were utilised.

**Independent variable: Subsidiary embeddedness**

Forsgren, Holm, and Johanson (2005) point out that MNC subsidiaries are each embedded in unique network business relationships, but the degree of embeddedness can vary for each MNC subsidiary. They also point out that although MNC subsidiary embeddedness is an important topic, it has been neglected in MNC subsidiary research.

Bartlett and Ghoshal (1998) identify an interesting example from Philips UK to show how important it is to adapt to and to be embedded in the local market. In late 1970’s Philips UK identified the potential of a television-text system, but Philips HQ management did not support UK Phillips’s idea. But the Phillips UK subsidiary believed in the potential of this market, and in 1982, they have sold half a million sets in the UK alone, although they had sold only 1,000 sets in 1977. This example also shows how important it is to be embedded in the local market and to understand its needs.

Thus, our study hypotheses are that ‘The higher the degree of the subsidiary’s embeddedness, the higher its likelihood of becoming a centre of excellence’, and ‘The higher the degree of adaptation of the subsidiary to the Japanese market, the higher its likelihood of becoming a centre of excellence’.

As chart 3-4-5 in the appendix shows, Andersson and Forsgren (2000) assess the extent to which a subsidiary’s product development and production process development are adapted to the requirements of specific customer/suppliers can be used to assess the
level of embeddedness of MNC subsidiary. We adopted their basic approach, but as we
were now focused on analysing the level of embeddedness of MNC subsidiaries in Japan,
we asked about the degree to which those subsidiaries’ products and after sales were
embedded in the Japanese local market.

Independent variable: Level of integration

MNC subsidiary integration into the larger MNC group can be viewed from two
perspectives. First, as Jarillo and Martinez (1990) state, integration can be viewed as
‘functional integration’, such as the integration of an MNC subsidiary’s manufacturing
process or R&D process into the rest of the MNC’s processes as a whole. Another
perspective is ‘information integration’, such as the degree to which an MNC subsidiary’s
technical information is integrated with the rest of the MNC’s as a whole.

The level of integration of a given MNC subsidiary needs to be understood together with
the level of localisation of the subsidiary—in other words, the embeddedness of an MNC
subsidiary. It might seem difficult to ask the MNC subsidiary to be both integrated with the
rest of the MNC and localised in its local market, because these two things are asking the
subsidiary to achieve centralisation and de-centralisation at the same time. However,
Jarillo and Martinez (1990) state that only an MNC subsidiary which does both of these
things as the same time can become the most competent MNC subsidiary.

Thus, our hypothesis is that ‘The more the subsidiary is integrated into the MNC system
and aligns its activities with the rest of the MNC, the higher its likelihood of becoming a
centre of excellence.’

Taggart (1998) measured MNC subsidiary integration by looking at 1) manufacturing, 2)
product specifications, 3) the extent to which the subsidiary served the MNC’s customer’s
worldwide market areas, 4) technology development information, 5) dependence on
linkages within the MNC’s internal network, and 6) centralisation of product planning
perspectives. By contrast, Jarillo and Martinez (1990) looked at 1) purchasing, 2) the
manufacturing process, 3) the proportion of local R&D out of the MNC’s total R&D, 4)
integration of R&D function with the group’s, 5) adaptation of products to the local market,
and 6) integration of marketing activities within the group.

As we can see from the above discussion and from chart 3-4-6 in the appendix, Taggart’s
and Jarillo and Martinez’s approaches are fundamentally similar. We incorporated both of
their approaches to suit our study in a way which was optimal for us. To focus our study, we included both questions about level of organisational integration and level of information integration to see the difference of impacts on creation of centres of excellence in terms of soft (information) area integration and hard (organisation) area integration. We hypothesised that when a subsidiary is more integrated into the global MNC system, it was more likely to be a centre of excellence.

We did not take Birkinshaw, Holm, Thilenius, and Arvidsson's (2000) approach because, as we can see from chart 3-4-6 in the appendix, their questions were ambiguous. In addition, their approach needed to be tested from the HQ viewpoint as well, so we concluded that their approach would not suit our study.

**Independent variable: HQ investment**

Frost, Birkinshaw, and Ensign (2002) discovered that a decision by the parent firm to invest in a subsidiary's development was endogenous and that subsidiaries that performed well as centres of excellence could expect to be rewarded by investment from the parent firm.

They particularly emphasized the importance of parent firm investment by stating strongly that the fundamental role of the parent company is the provision of tangible resources such as investment capital needed by the subsidiary in order for the subsidiary to develop the kind of advanced capabilities it needs to develop.

Thus, our hypothesis is that ‘The higher the investment the parent MNC makes in a given subsidiary, the higher the likelihood of its becoming a centre of excellence’.

We included questions to identify the level of HQ investment based on the approach set by Frost, Birkinshaw, and Ensign (2002), mainly focusing on R&D, production, and product development as we can see from chart 3-4-7, but we added additional questions about areas such as employee education in order to view HQ investment from a wider perspective.

**Independent variable: Japanese market impact**

Porter (1990) has identified in his model four factors associated with the competitive advantage of firms, and identifies ‘the degree of rivalry’ of the market the firm is actually
located in as a quite important factor for the formulation of this competitive edge.

Frost, Birkinshaw, and Ensign (2002) have basically used Porter’s diamond theory (1990). To analyse the impact of markets on subsidiaries, as in chart 3-4-8 in the appendix, they have seen effects from 1) Availability of supply materials, 2) Quality of suppliers, 3) Demands of customers, and 4) Level of competition. Nonetheless, we believe these four elements are not enough to analyse the specific effects of the Japanese market precisely. Many researchers argue that Japanese effects are quite different from those of other industrialised countries. Thus, we referred to the JETRO survey (2008) on MNC subsidiaries in Japan and selected additional areas mainly highlighted by many managers of foreign MNC subsidiaries in Japan. Especially, ‘difficulty of hiring talented people’, and ‘high business costs’ were among the most prominent claims; thus we have included those in our questions as well.

**Independent variable: Cultural effects**

Gupta and Govindarajan (2000) have analysed the proportion of local nationals in subsidiaries’ top management to see their linkage with information flow as we can see in chart 3-4-9 in the appendix. Interestingly, they formulated the hypothesis that the greater the proportion of local nationals within the subsidiary’s top management team, the lower the knowledge inflows into that subsidiary from peer subsidiaries and from the parent company. This hypothesis was rejected after they conducted their study. Nonetheless, we were impressed by the insight into the mother country’s effects and local effects on the performance of foreign MNC subsidiaries in Japan. Thus, we decided to identify the number of expatriates coming into Japanese subsidiaries in management positions. For example, the Mitsubishi corporation believes that a higher ratio of local management in markets outside of Japan will enhance their positioning in those markets; even at the very senior management level, they have almost doubled the number of non-Japanese in the last five years.
5. Pilot testing for survey

5-1 Preparation for Pilot stage

Before conducting the formal test, to ensure that our pre and formal test would go well, we conducted pre-interviews to assess the quality of our questionnaire. We interviewed 1) a university marketing professor, 2) a German entrepreneur/international strategy researcher, 3) an IBM Japan manager, and 4) a Johnson & Johnson Japan manager. The interviews were conducted both face to face and by e-mail. They took place between December, 2008, and January, 2009. Nearly 20 sections of the original questionnaires were reworked as a result of these interviews. The main feedback was that some of the questions were too academic for business people, and that business executives would find them difficult to understand.

After the reflecting on this feedback, 50 MNCs were randomly selected from our target MNCs, nevertheless making sure that the distribution of the size and MNC’s mother country was congruent with the larger 1388 MNC sample. The main purpose for this pre-test was to find out which parts of the questionnaire were unclear before conducting the actual survey to avoid gathering an insufficient number of replies.

5-2 Improvement from lessons learnt before conducting the pilot test

First, after we wrote the questionnaires in English (chart 3-5-1), we consulted a native English speaker to check it at the urging of a Canadian professor who works for a Japanese university. After finalising the questionnaire, (chart 3-5-1), based on feedback from the people we interviewed before the pilot test, we eliminated ambiguity and complexity in the questionnaire and merged redundant questions. When we conducted the actual survey we organised a follow up for the respondents who did not reply. This actually improved our response ratio.
5-3 Testing with small number of respondents

From the pre-test, we prepared a Japanese questionnaire in addition to the English questionnaire and sent both questionnaires to the 50 MNCs (chart 3-5-2). Most of the questionnaires were replied to using the Japanese version. Also, the response rate was 8%, as can be seen in chart 3-5-2. This rate was lower than expected, so to improve the response rate, we decided to improve incentives for responding. First, we showed our Japanese version to a mail survey specialist and modified several unclear Japanese expressions. Second, to enhance the value for respondents, we emphasized in the questionnaire that we would give the respondents a summary of our findings if they requested it.

### Chart 3-5-1: Key remarks for questionnaire improvement

<table>
<thead>
<tr>
<th>Item number</th>
<th>Key improvements made with feedback from pre-tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Questionnaire’s English checked by native speakers</td>
</tr>
<tr>
<td>2</td>
<td>Eliminated ambiguity and complexity in questions</td>
</tr>
<tr>
<td>3</td>
<td>Merged redundant questions</td>
</tr>
<tr>
<td>4</td>
<td>Organised follow-up for questionnaire replies</td>
</tr>
</tbody>
</table>

5-4 Outcome of the pilot study

Conducting the pilot test was quite important as we were able to discover several key points we did not realise. Especially, we realised that incentives for the respondents were very important for us in order to improve our response rate.

Summary of the main feedback from our pre-test follows:

1) Contrary to our original assumption, most managers of MNC subsidiaries in Japan
preferred to answer in Japanese.

2) Without incentives, we have discovered it was difficult for us to get proactive feedback.

3) We also discovered that more than two follow-up letters to potential respondents actually had a negative effect on returns.

6. Actual testing for survey

6-1 Translation

As we made two versions of the questionnaire, one in Japanese and one in English, the translation process was very important. This was because at most MNC subsidiaries, the actual administrative work is usually done by Japanese local managers, and as many Japanese, even those who are working for foreign MNC subsidiaries, do not have a good command of English, we made a Japanese version. We wrote that version first and then translated it into English. Because of broad language differences between Japanese and English, it is very difficult to translate accurately. We showed our translation to advisors who gave us feedback about the differences they observed between the Japanese and English versions. We had the actual English translation verified by a professional English translator. Basically, most of the respondents reacted quite positively to the translation from the Japanese version to the English one.

6-2 Operation of the mail survey

First we made a spreadsheet containing the companies' names, ratio of non-Japanese owners, addresses, and presidents' names, and we sent questionnaires (in Japanese and in English) to those companies. For the pre-test, we sent the English questionnaires only.

For the pilot study, we conducted two follow-ups after sending the actual questionnaires. The first reminders were sent four days before the deadline, and the second reminders were sent a day after the deadline. The second reminders had no effect; we did not receive any replies after sending it.

Another important point is that we were able to get the support from JMSA, a reputable Japanese management advisory organisation which was established by major Japanese companies such as Matsushita. We were able to put their logo on the questionnaires, and except for actual costs such as copying and postage, they assisted us with the administration work. Obviously, this assistance helped us substantially as we worked to
complete this quite time- and labour-consuming processes.

In the questionnaire, we highlighted the fact that we would use respondents’ feedback for a study that would be shared with Japanese academics and relevant institutions in order to improve the business environment in Japan. We got several positive comments from top MNC subsidiary management that this remark strongly motivated them to answer our questionnaires.

6-3 Profile of responding companies

As we can see from chart 3-6-1, the top three respondents’ parent companies were US (46%), Germany (23%), and Switzerland (13%). This is mostly in line with the JETRO (2008) survey, which also found that in terms of number of MNC subsidiaries in Japan, the US had the most, and Germany was second.

Another important point is made in chart 3-6-2; that is, that smaller and medium-sized MNCs were the ones that replied to this survey. Most MNCs with sales of more than 100 Million JPY/ year, which account for 11.9% of European MNCs and 12.1% of US MNC’s (Jetro 2008) did not proactively participate in this survey. Thus, it is important to note that our survey results might be focused more on small- to medium-size MNCs.
We tracked the record of questionnaire response as follows in our table. As stated, after sending out the questionnaires for the pre-test, we sent two reminders, but for the actual test, we reduced the number to one. We believe that sending reminders twice is considered excessive in the Japanese business community. Thanks to this change and the clarification of some of the contents of the questionnaires, the response rate was further improved.

We aspired to collect at least 100 replies to have credible data, and we were able to make this target as our response rate reached 10.2%. Overall responses reached more than 130 (chart 3-6-3).

We identified several interesting findings from these mailing results. First, as we can see
from chart 3-6-4, more than 90% of respondents used the Japanese questionnaire. Secondly, as we can see from chart 3-6-5, nearly 40% of the respondents were presidents, so we assume that our research project attracted strong interest from these executives.

<table>
<thead>
<tr>
<th>Chart 3-6-3 Response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Actual &amp; Pre survey</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Mailed No</td>
</tr>
<tr>
<td>Collection No</td>
</tr>
<tr>
<td>Ratio</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chart 3-6-4 Ratio of replies / English or Japanese questionnaires</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Answers</strong></td>
</tr>
<tr>
<td>English</td>
</tr>
<tr>
<td>Japanese</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chart 3-6-5 Ratio of replies / CEO or others</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Answers</strong></td>
</tr>
<tr>
<td>Presidents</td>
</tr>
<tr>
<td>Others</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

(For ‘Others’, all the respondents who mentioned their titles were above the ‘manager’ level)

6-5. Problems in data collection

The first challenge was to identify a database for all MNCs in Japan that would include the updated address and name of the appropriate contact person (in this case, the CEO). This problem was solved after identifying the Toyo Keizai database. Their database is updated every year, so the data is relatively new. Most reputable organisations such as JETRO also rely on the Toyo Keizai database, and we assume that this is the only credible information source that currently supplies an overview of MNCs in Japan.

Nonetheless, the economic environment surrounding MNCs in Japan is changing constantly, and this caused problems for our survey. One of problems was that, in just one year, several companies merged with other firms or simply disappeared. (These most
likely went out of business). The biggest problem arising from this was that CEO would also have changed within the past year. We assume that several questionnaires were not answered because of this discrepancy.

6-6 Main reasons for not answering / Non response bias

We identified three reasons for not responding to the survey. The first is that the applicable companies themselves disappeared, either because they went bankrupt or withdrew from the Japanese market. Sometimes companies claimed that they had become Japanese companies after a change of ownership and were thus unwilling to answer the survey. The second reason was that the CEO had changed and the person the questionnaire was addressed to was not there anymore. We do not have the exact data for this. This is due to a Japanese cultural difference: letters are sent to a person, not a position. Thus, if the CEO has changed, the incoming CEO might not check letters not addressed to them if they deem the letters not business-related. The final reason is that our questionnaires asked many sensitive questions, especially for mid-level Japanese managers working for foreign MNC subsidiaries in Japan. Some of them might have considered the answers to these questions to be core confidential information.

Therefore, to improve the response rate further, we need updated company information. We can’t update this simply by relying on the official data base. We need to check on this through a web search. This is a huge amount of work, but this kind of follow-up survey would certainly improve the response rate as we would be able to accurately identify the companies’ circumstances to get better replies. To check on CEO names, a similar approach would work, as most foreign MNC subsidiaries in Japan publicly announce the names of their CEO on their web sites. Double-checking CEO names from the Toyo keizai database would significantly improve the accuracy of the names of CEOs and improve the response rate.

6-7 Clean and check missing data

Before conducting our statistical analysis, we cleaned and checked missing data. We checked each variable for scores that were out of range, ascertained where in the data file this error occurred, and corrected or deleted the value (Pallant, 2007). In this way we eliminated errors from our data.

The bigger challenge was to resolve missing data. We took several steps to fill in missing
data. First, we discuss missing data regarding 1-5 scale questions.

1) When missing data from the applicable company was in a particular category, and if we obtained the answers for other questions in the same category, we calculated an average of answers and used this average to fill in the missing data.

2) If we were missing answers from a company to one entire category of questions, we calculated an average of applicable answers of all the responding companies and used this average to fill in the missing data.

For other missing data—especially that regarding the company’s profile such as ‘Sales’, ‘Regional sales ratio’, and ‘Number of employees’, we filled in the missing data by other means such as the company’s information database.

7 Summary

In this chapter, we first defined our basic research methodology and explained how we set appropriate dependent and independent variables for our study. Setting dependent variables to identify centres of excellence and applicable independent variables was especially crucial; without setting these variables optimally, entire parts of this work could have been undermined. Thus, we went through key literature to identify and discuss appropriate variables.

We discussed how we incorporated the points into our questionnaires and how we conducted our actual mail survey. It was essential for us to conduct a pre-test and ask the opinions of several people before we conducted the actual survey. Initially, we had the doubts about producing a questionnaire in Japanese as we judged that all respondents would be fluent in English as they were working for foreign MNC subsidiaries in Japan. However, this assumption was wrong, as the majority of respondents used the Japanese questionnaires. These improvements made it possible for us to collect a sufficient number of responses for our study.

Also, we have identified points we can improve upon, so we would like to reflect on these for our next steps.

In the following chapter, we discuss and analyse the data we collected through our survey.
1. Introduction

In this chapter, we review the descriptive analysis of the dependent variables and independent variables used in our study. Dependent variables define factors that distinguish centres of excellence from non-centres of excellence, and independent variables are the factors contributing to the formation of centres of excellence whose respective influence must be compared. Overall, our descriptive analysis aims to 1) describe the characteristics of the samples of this research; 2) check the variables for any violation of assumptions underlying the statistical techniques that we will use to address research questions; and 3) address specific research questions (Pallant, 2007).

Thus, before we examine the regression analysis in chapter 5, it is important for us to understand the overall profiles of MNC subsidiaries in Japan whose data we have collected for our study; which of these subsidiaries could be categorised as centres of excellence; and how the independent variables we surveyed are relevant for the formation of centres of excellence.

In the second section of this chapter, we analyse dependent variables to identify three types of centres of excellence. The first type is a ‘basic research centre of excellence’; the second type is a ‘product development centre of excellence’; the third type is ‘production centre of excellence.’ We believe it is wise to focus our research attention on the primary activities of R&D and manufacturing, where we can particularly see the emergence of centres of excellence. (Frost, Birkinshaw, and Ensign, 2002)

We evaluate dependent variables from several perspectives.

Following the examination of dependent variables, we look at the impact each independent variable has on the creation of different types of centres of excellence. It is here that the greatest value of the project lies, as it is by identifying key independent variables on the creation of centres of excellence that we gain insights and hints for strategy setting to systematically and effectively form centres of excellence in Japan.

In conclusion, we identify key independent variables necessary for the formation of centres of excellence through the descriptive analysis we conduct in the chapter.
2: Descriptive analysis

**Dependent Variable: Centres of excellence**

Before we start our discussion on centres of excellence as the dependent variable for the descriptive analysis in this section, we would like to review the definition of centres of excellence for our study.

In terms of defining centres of excellence, we have followed the definition set by seminal researchers Frost, Birkinshaw, and Ensign (2002). We focus on the following three dimensions in order to define centres of excellence as our dependent variables. First, centres of excellence have a physical presence. Second, centres of excellence have a set of superior capabilities flowing from both tangible and intangible assets. Thirdly, centres of excellence are recognised explicitly by the MNC itself; that is, in order to be recognised as a centre of excellence it is essential to have recognition from a third party within the MNC in which the subsidiary is situated.

As Frost, Birkinshaw, and Ensign (2002) have argued and we discussed in the introduction of this chapter, there are three types of centres of excellence: a research centre of excellence; a product development centre of excellence; and production centre of excellence. Cantwell and Mudambi (2005) also point out that ‘product development competence’ and ‘manufacturing competence’ are key criteria for establishing more competent MNC subsidiaries. Research competence can also be an important seed for a new product that results in the development of an MNC foreign subsidiary (Frost, Birkinshaw, and Ensign, 2002).

Therefore, we identify ‘Basic research centres of excellence’, ‘Product development centres of excellence’, and ‘Production centres of excellence’, not only from the subsidiary’s own perspective, but also from that MNC’s HQ and other subsidiaries’ perspectives, as these perspectives will clarify whether these centres of excellence are explicitly recognised in MNC or not. Chart 4-2-1 shows the three types of centres of excellence.
In our judgment, HQ recognition is particularly important for Type 2 centres of excellence. This is mainly because, as Frost, Birkinshaw, and Ensign (2002) argue, it is essential for MNC subsidiaries to have formal recognition within the MNC to be centres of excellence. In addition, HQ is the most essential tangible resource provider for these MNC subsidiaries. Birkinshaw and Hood (1998) also point out that parent (HQ) driven investment is the classic process by which subsidiaries develop and expand its role within MNC.

After clarifying the criteria to select centres of excellence, we set a cutoff point to distinguish between centres of excellence and non-centres of excellence. As we can see in chart 4-2-1, when respondents gave a score higher than or equal to 3 (5 being the most competent and 1 the least) points for applicable dependent variables such as research competence, product development competence, and manufacturing competence from the MNC subsidiary’s perspective, the perspective of MNC HQ, and the perspective of other MNC subsidiaries, we categorised them as centres of excellence. The reason to set a
score higher than or equal to 3 as the cutoff is because we deemed a score above 3 as the mark of clear and distinct difference. Also, as we can see from chart 4-2-2, our ratio of centres of excellence in the sample was around 20%. This is mostly in line with the findings of Frost, Birkinshaw, and Ensign (2002), as the ratio for most types of their centres of excellence was around 30%. If we were to raise the cutoff to 4, we would have far fewer centres of excellence compared with those in their study; if we lowered the cutoff to 2, we would have had too high a ratio. Thus, we deemed 3 as the optimal cutoff for this study.

We also tested other cutoffs in the next chapter to assess the robustness of our data.

[Chart 4-2-2: List of dependent variables and the ratio of ‘centre of excellence subsidiaries’ ]

<table>
<thead>
<tr>
<th>Type</th>
<th>Centres of excellence subsidiary / Positive influence in MNC</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Ratio of Centres of excellence subsidiary</th>
<th>Number of Centres of excellence subsidiary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>3.9</td>
<td>0.36</td>
<td>18.7%</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Type 2</td>
<td>3.9</td>
<td>0.516</td>
<td>20.5%</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>Type 3</td>
<td>3.8</td>
<td>0.393</td>
<td>18.7%</td>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

[Scale measures: 1 (not at all) to 5 (very strong)]

In summary, we studied and analysed the following three types of centres of excellence:

**Type 1: Centre of excellence subsidiary / Positive influence within the MNC**
Scores all above or equal to 3 for three applicable dependent variables (positive influence in MNC variables in chart 4-2-1).

**Type 2: Centre of excellence subsidiary / HQ recognition**
Scores all above or equal to 3 for three applicable dependent variables. (HQ recognition in MNC variables in chart 4-2-1).

**Type 3: Centre of excellence subsidiary / Subsidiary recognition**
Scores all above or equal to 3 for three applicable dependent variables. (Subsidiary recognition variables in chart 4-2-1)
As we can see from chart 4-2-2, we identified 25 Type 1 centres of excellence, 27 Type 2 centres of excellence, and 25 Type 3 centres of excellence. As our sample number is 134, this means that about 20% of the samples were classified as centres of excellence for each type. We infer that 80% of MNC subsidiaries in Japan are non-centres of excellence for each type.

There were not many differences in this area; Type 1 centres of excellence scored 3.9, Type 2 centres of excellence scored 3.9, and Type 3 Centres of excellence scored 3.8.

**Chart 4-2-3: Level of Autonomy of foreign MNC subsidiaries in Japan**

<table>
<thead>
<tr>
<th></th>
<th>Overall Mean</th>
<th>Overall Standard Deviation</th>
<th>Type 1 (CE : Positive Influence) vs (NCE : Positive Influence)</th>
<th>Type 2 (CE : HQ recognition) vs (NCE : HQ recognition)</th>
<th>Type 3 (CE : Subsidiary recognition) vs (NCE : Subsidiary recognition)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promoting &amp; Hiring top management in JP</td>
<td>3.09</td>
<td>1.406</td>
<td>3.36 (CE) 3.03(NCE)</td>
<td>3.30 (CE) 0.395(ANOVA)</td>
<td>3.36 (CE) 3.03(NCE)</td>
</tr>
<tr>
<td>Entering new market in JP</td>
<td>3.62</td>
<td>1.181</td>
<td>3.68 (CE) 3.61(NCE)</td>
<td>3.60 (CE) 0.896(ANOVA)</td>
<td>3.68 (CE) 3.61(NCE)</td>
</tr>
<tr>
<td>Entering new market outside JP</td>
<td>1.80</td>
<td>1.024</td>
<td>2.28 (CE) 1.69(NCE)</td>
<td>2.19 (CE) 0.028(ANOVA)</td>
<td>2.28 (CE) 1.69(NCE)</td>
</tr>
<tr>
<td>Changes of internal organisation in JP</td>
<td>3.32</td>
<td>1.358</td>
<td>3.28 (CE) 3.33(NCE)</td>
<td>3.26 (CE) 0.793(ANOVA)</td>
<td>3.24 (CE) 3.34(NCE)</td>
</tr>
<tr>
<td>Specifying new suppliers in JP</td>
<td>3.25</td>
<td>1.402</td>
<td>3.16 (CE) 3.28(NCE)</td>
<td>3.56 (CE) 0.982(ANOVA)</td>
<td>3.32 (CE) 3.24(NCE)</td>
</tr>
<tr>
<td>Business planning in JP</td>
<td>3.72</td>
<td>1.128</td>
<td>3.52(CE)</td>
<td>3.76(NCE)</td>
<td>3.48(CE)</td>
</tr>
<tr>
<td>------------------------</td>
<td>------</td>
<td>-------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>Advertising in JP</td>
<td>3.59</td>
<td>1.209</td>
<td>3.44(CE)</td>
<td>3.62(NCE)</td>
<td>3.48(CE)</td>
</tr>
<tr>
<td>CAPEX in JP</td>
<td>2.35</td>
<td>1.264</td>
<td>2.52(CE)</td>
<td>2.31(NCE)</td>
<td>2.56(CE)</td>
</tr>
<tr>
<td>Business operation in JP</td>
<td>3.77</td>
<td>1.13</td>
<td>3.52(CE)</td>
<td>3.83(NCE)</td>
<td>3.56(CE)</td>
</tr>
<tr>
<td>Overall means</td>
<td>3.16</td>
<td>0.808</td>
<td>3.20(CE)</td>
<td>3.16(NCE)</td>
<td>3.19(CE)</td>
</tr>
<tr>
<td>Overall ANOVA analysis</td>
<td>NA</td>
<td>NA</td>
<td>0.848</td>
<td>0.853</td>
<td>0.664</td>
</tr>
</tbody>
</table>

[Scale measures: 1 (not at all) to 5 (very strong)]
['CE': Centres of Excellence']
['NCE': Non-Centres of Excellence']

‘Autonomy’ for MNC subsidiaries is defined as ‘the ability to identify and pursue interesting market opportunities without explicit permission from the parent company’ (Frost, Birkinshaw, and Ensign, 2002). Recent literature suggests that the greater the extent of subsidiary’s autonomy, ‘the better the ability of the subsidiary to form favourable external network linkages with other companies and institutions in its own local environment’ (Birkinshaw et al., 1998; Andersson and Forsgren, 2000). Therefore it can be assumed that ‘the greater the local embeddedness of the subsidiary, the higher the likelihood that it will acquire a competence creating mandate’ (Cantwell and Mudambi, 2005).

MNC subsidiaries in Japan seem to have a medium level of overall autonomy. We discovered that MNC subsidiaries in Japan have a stronger level of autonomy when it comes to making decisions about ‘Business operations in the Japanese market’, ‘Business strategy planning in Japan’, ‘Entering new markets in Japan’, and ‘Advertising for the Japanese market’. They have a moderate level of autonomy when it comes to ‘Changes of internal organisation in Japan’, ‘Specifying new suppliers in Japan’, and ‘Promoting and hiring top management in Japan’. We had anticipated that MNC
subsidiaries in Japan would not have a very strong overall level of autonomy, and that their autonomy would be more focused on Japanese market-related operational areas. It appears that MNC subsidiaries in Japan had relatively weak levels of autonomy when it came to deciding on ‘Investment (CAPEX) for their own subsidiaries in Japan’ and ‘Entry into new overseas market outside of the Japanese market’. This was also in line with our expectations. We assumed that MNC subsidiaries in Japan would not have a strong level of autonomy for overseas markets outside of Japan, as only 17.1% of Japanese MNC subsidiaries have oversight for overseas markets outside of Japan as regional HQ in Asia (JETRO, 2008). Secondly, we also assumed that MNC subsidiaries in Japan would not have a strong level of autonomy in areas such as CAPEX, as this is normally an area in which HQ has the stronger mandate.

We conducted a reliability test to check on the validity of the autonomy variables. Although 8 is appropriate for cognitive tests such as intelligence tests, .7 is more suitable for ability tests (Kline 1999). DeVeills (2003) also claims that ideally, Cronbach’s alpha coefficient should be above .7; however, values above .8 are preferable (Pallant, 2007).

Cronbach’s alpha for this dataset was calculated at 0.83 for the overall autonomy variables. Only the autonomy competence ‘Entering new markets outside of the Japanese market’ had a slightly different tendency from the other autonomy related variables. However, even if we removed this variable, Cronbach’s alpha improved only to 0.84, so we decided to keep ‘Entering new markets outside the Japanese market’ for further analysis.

When we compare the level of autonomy of centres of excellence with non-centres of excellence for all three types (Type 1, 2, 3 as shown in the table above), centre of excellence showed higher autonomy levels than non-centres of excellence. Generally, when we compared the overall level (not within subsections) of independent variables, centres of excellence always showed higher levels than non-centres of excellence. But we have to note that we have not analysed changes in autonomy from a chronological viewpoint. Also, in a comparison between Type 2 centres of excellence and non-centres of excellence, only the autonomy level for ‘Entering new markets outside of Japan’ showed a significant difference, with an ANOVA figure of 0.028. We did an ANOVA for each sub-segment of each independent variable only for Type 2 centres of excellence in this section of the study, because we believe—as Frost, Birkinshaw, and Ensign (2002) suggest—that among the three types of centres of excellence, we need to focus on Type 2. This analysis shows clearly how MNC subsidiaries are evaluated explicitly within the MNC.
We believe that HQ evaluation makes the biggest impact.

When we look into the details of autonomy competence analysis, we observe something interesting. Especially in the areas of ‘Promotion and Hiring top management’, ‘Entering new markets outside Japan’ and ‘CAPEX in Japan’, all three types of centres of excellence scored higher than those of non-centres of excellence. Thus, we can infer that centres of excellence do not necessarily imply strong overall autonomy. However, we can infer that centres of excellence have stronger autonomy in areas such as internal HR handling (promotion and hiring of top management), stronger competence to get into overseas markets outside Japan (entering new markets outside Japan), and stronger positions on CAPEX (CAPEX in Japan).

In their ‘centres of excellence in multinational corporations’, Frost, Birkinshaw and Ensign (2002) found that autonomy did not significantly impact the formation of centres of excellence. Associated with this is Bartlett and Ghoshal’s (1989) observation: ‘This describes the rationalization process associated with moving away from ‘multidomestic’ configurations characterised by substantial independence at the unit level to ‘transnational’ configurations characterised by substantial interdependence.’ Frost, Birkinshaw and Ensign (2002, p1013) write, ‘It also seems likely that, once formally recognised as a center of value creation for the corporation as a whole, the subsidiary may be forced to give up some of its autonomy as the firm seeks to integrate the unit into its global network of innovation, production, and distribution.’

[Summary]

- **Autonomy level of MNC subsidiaries in Japan**
  - MNC subsidiaries in Japan seemed to have a moderate level of overall autonomy.

- **Comparison between centres of excellence and non-centres of excellence**
  - Centres of excellence showed slightly more autonomy.
  - However, especially in the area of ‘Entering new markets outside of Japan’, centres of excellence and non-centres of excellence showed significant differences.
**Chart 4-2-4: Level of scope expansion of foreign MNC subsidiaries in Japan over three years.**

<table>
<thead>
<tr>
<th></th>
<th>Overall Mean</th>
<th>Overall Standard Deviation</th>
<th>Type 1 (CE: Positive Influence) vs (NCE: Positive Influence)</th>
<th>Type 2 (CE: HQ recognition) vs (NCE: HQ recognition)</th>
<th>Type 3 (CE: Subsidiary recognition) vs (NCE: Subsidiary recognition)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&amp;D work</td>
<td>1.91</td>
<td>1.204</td>
<td>2.88 (CE) 1.69 (NCE)</td>
<td>2.74 (CE) 1.70 (NCE)</td>
<td>2.84 (CE) 1.70 (NCE)</td>
</tr>
<tr>
<td>Purchasing</td>
<td>2.24</td>
<td>1.158</td>
<td>2.60 (CE) 2.16 (NCE)</td>
<td>2.59 (CE) 2.15 (NCE)</td>
<td>2.72 (CE) 2.13 (NCE)</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>2.04</td>
<td>1.289</td>
<td>2.84 (CE) 1.85 (NCE)</td>
<td>2.70 (CE) 1.87 (NCE)</td>
<td>2.84 (CE) 1.85 (NCE)</td>
</tr>
<tr>
<td>Sales</td>
<td>3.37</td>
<td>1.08</td>
<td>3.44 (CE) 3.35 (NCE)</td>
<td>3.52 (CE) 3.33 (NCE)</td>
<td>3.48 (CE) 3.34 (NCE)</td>
</tr>
<tr>
<td>After sales</td>
<td>3.16</td>
<td>1.098</td>
<td>3.32 (CE) 3.13 (NCE)</td>
<td>3.41 (CE) 3.10 (NCE)</td>
<td>3.40 (CE) 3.11 (NCE)</td>
</tr>
<tr>
<td>Overall means</td>
<td>2.54</td>
<td>0.831</td>
<td>3.02 (CE) 2.43 (NCE)</td>
<td>2.99 (CE) 2.43 (NCE)</td>
<td>3.06 (CE) 2.43 (NCE)</td>
</tr>
<tr>
<td>Overall ANOVA analysis</td>
<td>NA</td>
<td>NA</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
</tr>
</tbody>
</table>

[Scale measures: 1 (not at all) to 5 (very strong)]  
[‘CE’ : ‘Centre of Excellence’]  
[‘NCE’ : ‘Non-Centre of Excellence’]
‘Scope expansion over three years’ identifies the ‘entrepreneurship’ of MNC subsidiaries over time. ‘A subsidiary that is focused more on its external competitive environment is likely to have much greater capacity for entrepreneurial behaviours - in choosing what customers or suppliers to work with, and how it positions itself vis-a-vis local competitors. And correspondingly, its charter is likely to be defined more broadly’ (Birkinshaw, Hood and Young, 2005).

Birkinshaw, Frost, and Ensign (2002, p1003) state, ‘Subsidiaries that perform well in their role as a center of excellence can expect to be rewarded by the parent firm in the form of additional investment and, perhaps, an expansion of their charter’. Therefore, it could be inferred that the more entrepreneurship MNC subsidiaries demonstrate, the more likely it is that they will hold a centre of excellence mandate.

MNC subsidiaries in Japan seem to have relatively low levels of ‘Entrepreneurship’ in the area of ‘scope expansion’. It is especially low for expansion in ‘R&D work’ and ‘Manufacturing’. However, it is moderate in the areas of ‘Sales’ and ‘After sales’. It could be assumed that MNC subsidiaries in Japan have extended their scope in areas where large investment is not necessary. JETRO conducted a survey of MNC subsidiaries’ main functions in Japan in 2008. Each MNC subsidiary respondent commented on its two main focusing functions in Japan. According to the survey, 66.1% of MNC subsidiaries in Japan were focused on sales, 32.6% were focused on after service (sales), 11.8% were focused on purchasing, and 5.3% were focused on basic R&D. The outcome was basically in line with the scope expansion of Japanese MNCs we have observed here.

Cronbach’s alpha was 0.76 for this dataset. Even for a detailed analysis where only ‘scope expansion over three years’ showed slightly different trends, there were no variables significantly undermining internal validity.

Overall, when we compare the level of overall ‘scope expansion’ for centres of excellence and non-centres of excellence for all three types (Types 1, 2, and 3 in the above table), centres of excellence showed higher levels on the three-year scope of expansion than those of non-centres of excellence. ANOVA figures validate significant difference between centres of excellence and non-centres of excellence, as an ANOVA for all three types (between centres of excellence and non-centres of excellence) scored less than 0.01. Birkinshaw, Hood, and Young (2005) also found that ‘Externally competitive MNC subsidiaries’ scored higher levels for expansion than that of ‘Internally competitive MNC
There is a significant difference between centres of excellence and non-centres of excellence with regard to the expansion of ‘R&D work’ and ‘Manufacturing’. ANOVA figures for Type 2 (comparing centres of excellence with non-centres of excellence) show that both ‘R&D work’ and ‘Manufacturing’ scored less than 0.002, with an especially significant ANOVA figure for ‘R&D work’. This finding is interesting as we have noted earlier that overall MNC subsidiaries’ ‘scope expansion’ level is quite low for ‘R&D work’ and ‘Manufacturing’. Thus, we can infer that centres of excellence tend to have a higher level of scope expansion over three years, especially in ‘R&D work’ and ‘Manufacturing’, compared with those of non-centres of excellence. In terms of the level of scope expansion in R&D work, Cantwell and Mudambi (2005, p1120) state that ‘R&D will tend to be higher in subsidiaries that acquire centre of excellence mandates as opposed to those that do not.’

Finally, it is important to note that we believe that ‘scope expansion’ is also strongly related to ‘MNC investment in the subsidiary over three years’. We will look more closely at this relationship in the next section.

[Summary]

- **Scope expansion over three years of MNC subsidiaries in Japan**
  - MNC subsidiaries in Japan seemed to have relatively low level of scope expansion.
  - They had relatively stronger level of scope expansion over three years in ‘Sales’ and ‘After sales’, and especially weak levels of expansion in ‘R&D work’ and ‘Manufacturing’.

- **Comparison between centres of excellence and non-centres of excellence**
  - Overall, centres of excellence showed a higher level of scope expansion over three years than that of non-centres of excellence, and the difference was significant.
  - At the sub-section level, centres of excellence and non-centres of excellence showed a significant difference in ‘R&D work’ and ‘Manufacturing’ over three years.
### Chart 4-2-5: HQ Investment in Japanese MNC Subsidiaries over Three Years

<table>
<thead>
<tr>
<th>Type</th>
<th>Overall Mean</th>
<th>Overall Standard Deviation</th>
<th>Type 1 (CE: Positive Influence) vs (NCE: Positive Influence)</th>
<th>Type 2 (CE: HQ recognition) vs (NCE: HQ recognition)</th>
<th>Type 3 (CE: Subsidiary recognition) vs (NCE: Subsidiary recognition)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic research</td>
<td>0.78</td>
<td>1.247</td>
<td>1.76 (CE) 0.56 (NCE)</td>
<td>1.66 (CE) 0.56 (NCE) 0.000(ANOVA)</td>
<td>1.76 (CE) 0.56 (NCE)</td>
</tr>
<tr>
<td>Application engineering</td>
<td>1.66</td>
<td>1.556</td>
<td>2.44 (CE) 1.48 (NCE)</td>
<td>2.30 (CE) 1.50 (NCE) 0.016(ANOVA)</td>
<td>2.36 (CE) 1.50 (NCE)</td>
</tr>
<tr>
<td>Product development</td>
<td>1.42</td>
<td>1.518</td>
<td>2.56 (CE) 1.16 (NCE)</td>
<td>2.44 (CE) 1.16 (NCE) 0.000(ANOVA)</td>
<td>2.60 (CE) 1.15 (NCE)</td>
</tr>
<tr>
<td>Production of Goods and Services</td>
<td>1.80</td>
<td>1.588</td>
<td>2.76 (CE) 1.58 (NCE)</td>
<td>2.67 (CE) 1.58 (NCE) 0.001(ANOVA)</td>
<td>2.84 (CE) 1.56 (NCE)</td>
</tr>
<tr>
<td>Logistics / Distribution</td>
<td>1.82</td>
<td>1.403</td>
<td>2.56 (CE) 1.65 (NCE)</td>
<td>2.44 (CE) 1.66 (NCE) 0.009(ANOVA)</td>
<td>2.52 (CE) 1.66 (NCE)</td>
</tr>
<tr>
<td>Employee education</td>
<td>2.44</td>
<td>1.318</td>
<td>2.60 (CE) 2.40 (NCE)</td>
<td>2.56 (CE) 2.41 (NCE) 0.613(ANOVA)</td>
<td>2.52 (CE) 2.42 (NCE)</td>
</tr>
<tr>
<td>Overall means</td>
<td>1.65</td>
<td>1.06</td>
<td>2.45 (CE) 1.47 (NCE)</td>
<td>2.35 (CE) 1.48 (NCE)</td>
<td>2.43 (CE) 1.47 (NCE)</td>
</tr>
<tr>
<td>Overall ANOVA analysis</td>
<td>NA</td>
<td>NA</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

[Scale measures: 1 (not at all) to 5 (very strong)]

['CE': 'Centre of excellence']

['NCE': 'Non-centre of excellence']
HQ investment in MNC subsidiaries over three years identifies the level of CAPEX made by MNC HQ in MNC subsidiaries in Japan. Birkinshaw and Hood (1998) identify parent-driven investment ‘as one of the classic processes through which subsidiaries develop capabilities that subsequently form the basis for an expanded role within the company.’ Thus, we assume that tangible HQ investment in MNC subsidiaries in Japan is as important as the transfer of intangible HQ assets we discuss below. ‘The fundamental role of the parent firm is typically as a provider of tangible resources, especially investment capital, needed by the subsidiary to develop the kind of advanced capabilities that may give rise to its eventual recognition as a centre of excellence’ (Frost, Birkinshaw, and Ensign, 2002, p1003).

Overall, MNC subsidiaries in Japan have had a very low level of HQ investment in the last three years, meaning a very low level of parent-driven investment. This can also be verified by the following chart describing overall CAPEX trend in non-Japanese MNC subsidiaries (chart 4-2-3). The extremely low level of HQ investment in ‘Basic research’ is noteworthy. JETRO’s 2008 survey in this area found that although 63% of respondents predicted an expanded scope of business, only 18.2% companies among them said that they would expand their basic research capabilities. This means that overall only around 11% of MNC subsidiaries in Japan had the intention to strengthen this area. However, JETRO did find that among 63% of responding companies, 73.8% of them—nearly 50% of MNC subsidiaries in Japan—intended to try to expand in sales. This clearly shows that majority of MNC subsidiaries in Japan are focusing extensively on the areas such as sales, where they do not need substantial HQ investment.

An internal validity test for this variable gave a Cronbach’s alpha of 0.83. Although the level of HQ investment in employee education over three years had slightly different trends, no variables significantly undermined internal validity in a detailed analysis.

When comparing the level of HQ investment over three years between centres of excellence and non-centres of excellence, a significant difference emerged. All three types of centres of excellence had substantially higher level of HQ investment level over the last three years compared with that of non-centres of excellence. An ANOVA for all three types (comparing centres of excellence and non-centres of excellence) was significant as well.

At the sub-section level, centres of excellence and non-centres of excellence subsidiaries showed significant differences in ‘Basic research’, ‘Production’, ‘Product development’,
and ‘Logistics’. The ANOVA level (Type 2 / comparing centres of excellence and non-centres of excellence) for ‘Basic research’, ‘Application engineering’, ‘Production’, ‘Products development’, and ‘Logistics’ was less than 0.05, indicating significant difference. As there was no significant difference in ‘Employee education’, it is possible to say that there were more differences between centres of excellence and non-centres of excellence where significant levels of HQ investment were required. This is in line with our findings that centres of excellence expanded significantly in the R&D and Manufacturing sectors over three years, requiring significant HQ investment. In terms of the level of HQ investment in R&D, Frost, Birkinshaw, and Ensign (2002, p1009) observe that ‘The impact of parent firm investment appears to be especially important for research and development centers.’

(Chart 4-2-6: Total sum of annual CAPEX in non-Japanese MNCs in Japan)

- Data source: Japanese government survey, 2010

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[Summary]

- **HQ investment in MNC subsidiaries in Japan over three years**
  - MNC subsidiaries in Japan seem to have significantly low level of ‘HQ investment over three years’.
  - They have especially weak levels of ‘HQ investment over three years’ in ‘Basic research’.

- **Comparison between centres of excellence and non-centres of excellence**
  - Overall, centres of excellence have a far higher level of HQ investment over three years than that of non-centres of excellence.
  - At the sub-section level, centres of excellence have significant different levels of HQ investment over three years in ‘Basic research’, ‘Application engineering’, ‘Production’, ‘Product development’, and ‘Logistics’ compared with non-centres of excellence.
### Chart 4-2-7: Level of Subsidiary links to sources of MNC external & internal competence

<table>
<thead>
<tr>
<th></th>
<th>Overall Mean</th>
<th>Overall Standard Deviation</th>
<th>Type 1 (CE : Positive Influence) vs (NCE : Positive Influence)</th>
<th>Type 2 (CE : HQ recognition) vs (NCE : HQ recognition)</th>
<th>Type 3 (CE : Subsidiary recognition) vs (NCE : Subsidiary recognition)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate HQ</td>
<td>3.63</td>
<td>1.313</td>
<td>3.62 (CE) 3.64 (NCE)</td>
<td>3.64 (CE) 3.59 (NCE) 0.880(ANOVA)</td>
<td>3.52 (CE) 3.65 (NCE)</td>
</tr>
<tr>
<td>Specific corporate research unit</td>
<td>2.56</td>
<td>1.318</td>
<td>3.12 (CE) 2.43 (NCE)</td>
<td>3.11 (CE) 2.42 (NCE) 0.014(ANOVA)</td>
<td>3.00 (CE) 2.46 (NCE)</td>
</tr>
<tr>
<td>Specific internal / corporate customer</td>
<td>2.74</td>
<td>1.28</td>
<td>3.08 (CE) 2.66 (NCE)</td>
<td>3.07 (CE) 2.65 (NCE) 0.128(ANOVA)</td>
<td>3.00 (CE) 2.68 (NCE)</td>
</tr>
<tr>
<td>Specific internal / corporate supplier</td>
<td>2.42</td>
<td>1.184</td>
<td>2.76 (CE) 2.34 (NCE)</td>
<td>2.78 (CE) 2.32 (NCE) 0.077(ANOVA)</td>
<td>2.80 (CE) 2.33 (NCE)</td>
</tr>
<tr>
<td>Specific external customers</td>
<td>2.89</td>
<td>1.324</td>
<td>2.88 (CE) 2.89 (NCE)</td>
<td>2.96 (CE) 2.87 (NCE) 0.744(ANOVA)</td>
<td>3.00 (CE) 2.86 (NCE)</td>
</tr>
<tr>
<td>Specific external suppliers</td>
<td>2.16</td>
<td>1.143</td>
<td>2.64 (CE) 2.05 (NCE)</td>
<td>2.74 (CE) 2.01 (NCE) 0.003(ANOVA)</td>
<td>2.76 (CE) 2.02 (NCE)</td>
</tr>
<tr>
<td>Specific distributors</td>
<td>2.54</td>
<td>1.224</td>
<td>2.92 (CE) 2.46 (NCE)</td>
<td>2.93 (CE) 2.45 (NCE) 0.070(ANOVA)</td>
<td>2.96 (CE) 2.45 (NCE)</td>
</tr>
<tr>
<td>Specific competitors</td>
<td>3.13</td>
<td>1.223</td>
<td>3.44 (CE) 3.06 (NCE)</td>
<td>3.45 (CE) 3.05 (NCE) 0.131(ANOVA)</td>
<td>3.40 (CE) 3.06 (NCE)</td>
</tr>
</tbody>
</table>
C. A comparison of MNC subsidiaries' links to sources of MNC competences from both 'External' and 'Internal' sources were measured. Regarding external linkage, Powell, Koput and Smith-Doerr (1996) observe that 'Competence development is facilitated by active participation of the subsidiary in the ‘community of practice’ that structures activity and relationships in a particular area.' Regarding internal linkage, Nohria and Ghoshal (1997) suggest that the multinational enterprise can be modeled as a ‘differentiated network,’ and Frost, Birkinshaw, and Ensign (2002) infer from this that ‘the foreign subsidiary is connected not only to the headquarters of the parent firm but also to other subsidiary units around the world.’ Frost, Birkinshaw, and Ensign (2002, p1002) also state that external and internal network linkages can work in a very similar manner.

Overall, we found that MNC subsidiaries in Japan had a moderately low level of linkage. However, we observed strong linkage with corporate HQ and specific competitors. There was a clear trend toward corporate HQ as the strongest influence in internal linkage and specific competitors as the strongest influence in external linkage. Other relationships were relatively weak for both internal and external linkages. However, Frost, Birkinshaw, and Ensign (2002, p1012) posit ‘a positive relationship between external actor influence and center of excellence formation’, and they also argue that ‘other parts of the multinational firm were likely to play an important role in the formation of centers of excellence.’ The difference between our research and their study might have occurred because we investigated MNC subsidiaries in Japan, whereas they studied MNC.
subsidiaries in Canada.

An internal validity test for this variable produced a Cronbach’s alpha figure of 0.81. Thus, we assume there are no internal validity issues. No variables significantly affected internal validity.

There was no significant difference between centres of excellence and non-centres of excellence in terms of the level of subsidiary links to sources of MNC external and internal competence, although the overall average figures for all three types of centres of excellence were higher than those of non-centres of excellence. An ANOVA analysis for centres of excellence and non-centres of excellence verified this, as Type 1 and Type 3 had ANOVA figures slightly below 0.05, and only Type 2 had an ANOVA figure of 0.023, which showed a significant difference.

At the sub-section level, our findings were similar; there was no significant difference between centres of excellence and non-centres of excellence except in the areas of ‘Specific corporate research unit’, ‘Specific external supplier’, and ‘Specific external research unit’. This was in line with our findings overall. However, the fact that there was no difference between centres of excellence and non-centres of excellence at the level of MNC subsidiary links to ‘Specific external customers’ is striking. We assume that both types of subsidiary have the same level of linkage with ‘Specific external customers’.

[Summary]

- **Level of subsidiary links to sources of MNC external and internal competence and knowledge flow**
  - MNC subsidiaries in Japan seem to have moderately low levels of links to sources of MNC external and internal competence and knowledge flow.

- **Comparison between centres of excellence and non-centres of excellence**
  - Overall, centres of excellence have moderately higher levels of links to sources of MNC external and internal competence and knowledge flow than non-centres of excellence.
  - At the sub-section level, there is no significant difference between the two types of subsidiaries except in the areas of ‘Specific corporate research units’, ‘Specific external suppliers’, and ‘Specific external research units’.
### Chart 4-2-8: Level of MNC information integration

<table>
<thead>
<tr>
<th></th>
<th>Overall Mean</th>
<th>Overall Standard Deviation</th>
<th>Type 1 (CE : Positive Influence) vs (NCE : Positive Influence)</th>
<th>Type 2 (CE : HQ recognition) vs (NCE : HQ recognition)</th>
<th>Type 3 (CE : Subsidiary recognition) vs (NCE : Subsidiary recognition)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical information</td>
<td>3.44</td>
<td>1.312</td>
<td>3.76 (CE) 3.37 (NCE)</td>
<td>3.82 (CE) 3.35 (NCE) 0.097 (ANOVA)</td>
<td>3.76 (CE) 3.37 (NCE)</td>
</tr>
<tr>
<td>Supplier information</td>
<td>2.63</td>
<td>1.236</td>
<td>2.93 (CE) 2.56 (NCE)</td>
<td>2.93 (CE) 2.55 (NCE) 0.160 (ANOVA)</td>
<td>2.88 (CE) 2.57 (NCE)</td>
</tr>
<tr>
<td>Market / Client</td>
<td>3.49</td>
<td>1.122</td>
<td>3.68 (CE) 3.44 (NCE)</td>
<td>3.67 (CE) 3.44 (NCE) 0.349 (ANOVA)</td>
<td>3.60 (CE) 3.46 (NCE)</td>
</tr>
<tr>
<td>Product information</td>
<td>3.77</td>
<td>1.04</td>
<td>3.88 (CE) 3.74 (NCE)</td>
<td>3.93 (CE) 3.73 (NCE) 0.381 (ANOVA)</td>
<td>3.92 (CE) 3.73 (NCE)</td>
</tr>
<tr>
<td>Overall means</td>
<td>3.33</td>
<td>0.93</td>
<td>3.56 (CE) 3.28 (NCE)</td>
<td>3.58 (CE) 3.27 (NCE) 0.328 (ANOVA)</td>
<td>3.54 (CE) 3.28 (NCE)</td>
</tr>
<tr>
<td>Overall ANOVA analysis</td>
<td>NA</td>
<td>NA</td>
<td>0.175</td>
<td>0.117</td>
<td>0.216</td>
</tr>
</tbody>
</table>

[Scale: 1 (not at all) to 5 (very strong)]

[‘CE’: ‘Centres of Excellence’ ]

[‘NCE’: ‘Non-Centres of Excellence’ ]

‘MNC level of information integration’ is a measure of the integration level of information within the MNC—that is, how well subsidiaries share information within their internal MNC networks. Jarillo and Martinez (1990) observed the process of MNC information integration mainly in the areas of 1) purchasing, 2) the manufacturing process, 3) integration of R&D function with the group, 4) adaptation of products to the local market, and 5) integration of marketing activities within the group. Using the work of Jarillo and Martinez as a model, we examined levels of MNC information integration by asking about
information integration with regard to 1) technical information, 2) supplier information, 3) information about markets and clients, and 4) product information.

In general, MNC subsidiaries in Japan have moderately high level of information integration, with especially levels of sharing in the area of product information, technical information, and market/client information. However, they did not share procurement information very well. This is probably because supplier information is too localised compared with the other categories of information, and thus might not be that useful for the MNC subsidiaries in other countries. For example, many suppliers are local only to the Japanese market, and many of those in other countries are local to that country.

For this dataset, Cronbach’s alpha was 0.803, sufficient to keep internal validity intact; none of the variables undermined internal validity significantly.

In terms of the overall comparison of centres of excellence and non-centres of excellence, ANOVA figures ranged between 0.117 and 0.216, showing no significant difference in the level of MNC information integration.

There were also no significant differences at the subunit level between centres of excellence and non-centres of excellence, but there was some difference at the level of MNC information integration in the areas of ‘Technical information’; the ANOVA figure was 0.097, a slightly significant difference.

[Summary]

- **Level of MNC information integration**
  - MNC subsidiaries in Japan had moderately high levels of MNC information integration.
  - However, they had moderately low levels of information integration in the area of supplier information.

- **Comparison between centres of excellence and non-centres of excellence**
  - Overall, centres of excellence had somewhat higher levels of MNC information integration than non-centres of excellence.
  - At the sub-section level, there was no significant difference between the two kinds of subsidiaries, although there was a slightly greater difference in the area of ‘Technical information’.

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In this section we look at the level of MNC process and function integration to assess how successfully MNC subsidiaries put know-how within their MNC network into action. Frost, Birkinshaw, and Ensign (2002, p1002) state that ‘network linkages make it easier for foreign subsidiary units to coordinate their activities on a worldwide basis, but they also represent an important source of intangible knowledge flows.’ Thus, by analyzing the MNC process and function integration, we can clarify ‘network linkages’. Jarillo and Martinez (1990) define ‘integration’ as ‘those activities that are performed in the country with the
same activities in other subsidiaries of the firm.’ When an MNC subsidiary demonstrates a high ‘Degree of integration’ and a high ‘Degree of localisation’, they defined these subsidiaries as ‘Active subsidiaries’—close to what our research called ‘centres of excellence’.

Overall, MNC subsidiaries in Japan had lower levels of process and function. They were moderately high in the area of marketing activities, but relatively low in all other activities: manufacturing, R&D, and purchasing processes. Jarillo and Martinez (1990, p503) found that as MNC subsidiaries became more localised, they tended to become less integrated. We found that MNC subsidiaries in Japan were more localised and less integrated.

An internal validity test gave an overall Cronbach’s alpha of 0.782, thus indicating no internal validity issues. Also, although level of integration in the area of marketing showed a slightly different tendency, we verified that none of these variables affected internal validity significantly.

When comparing levels of process and function integration in centres of excellence and non-centres of excellence, ANOVA analyses produced significant differences for all three types. Thus, unlike the level of information integration, we found that level of process and function integration had significant effects on the formation of centres of excellence.

Also, at the sub-unit level, we found significant differences between centres of excellence and non-centres of excellence in levels of process and function integration in the areas of ‘Purchasing process,’ ‘Manufacturing process,’ and R&D process’. It is a challenge for MNC subsidiaries to integrate these processes well, but when they do, it is quite rewarding for their development as centres of excellence.
[Summary]

- **Level of MNC process and function integration**
  - MNC subsidiaries in Japan seem to have moderately low levels of process and function integration within the MNC.
  - However, they have moderately high levels in the specific area of marketing process and function integration within the MNC.

- **Comparison between centres of excellence and non-centres of excellence**
  - Overall, centres of excellence have significantly higher levels of MNC process and function integration than non-centres of excellence.
  - At the sub-section level, centres of excellence show significant differences with non-centres of excellence in the areas of ‘Purchasing process’, ‘Manufacturing process’, and ‘R&D process’ integration within the MNC.

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**Chart 4-2-10: Level of cross functional activity in MNC subsidiaries in Japan**

<table>
<thead>
<tr>
<th>Type</th>
<th>Overall Mean</th>
<th>Overall Standard Deviation</th>
<th>Type 1 (CE : Positive Influence) vs (NCE : Positive Influence)</th>
<th>Type 2 (CE : HQ recognition) vs (NCE : HQ recognition)</th>
<th>Type 3 (CEe : Subsidiary recognition) vs (NCE : Subsidiary recognition)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross functional</td>
<td>2.93</td>
<td>1.418</td>
<td>3.32 (CE) 2.83 (NCE)</td>
<td>3.30 (CE) 2.83 (NCE)</td>
<td>3.24 (CE) 2.85 (NCE)</td>
</tr>
<tr>
<td>Overall means</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Overall ANOVA analysis</td>
<td>NA</td>
<td>NA</td>
<td>0.123</td>
<td>0.129</td>
<td>0.220</td>
</tr>
</tbody>
</table>

[Scale measures: 1 (not at all) to 5 (very strong)]

['CE': ‘Centres of Excellence’]

['NCE': ‘Non-Centres of Excellence’]
Levels of cross functional team activities are also important factors for understanding knowledge flow within MNC subsidiaries. Galbraith (1973) and Nadler and Tushman (1987) identified liaison positions, task forces, and permanent committees as some of the key formal structural mechanisms for integrating multiple units of an organization.

Overall, MNC subsidiaries in Japan have moderately low levels of cross functional team activity. We might expect the success of Nissan in implementing cross functional teams to encourage MNC subsidiaries in Japan to form more such teams, but apparently this has not happened.

There is no internal validity issue with these findings.

ANOVA figures for levels of cross functional activity in centres of excellence and non-centres of excellence ranged from 0.123 to 0.220, showing no significant difference. In general, we can safely assume that the presence of cross functional activities has limited influence on centre of excellence formation.

[Summary]

- **Level of cross functional activity of MNC subsidiaries in Japan**
  - MNC subsidiaries in Japan seem to have moderately low levels of cross functional activity.

- **Comparison between ‘Centres of excellence’ and non-centres of excellence**
  - Overall, centres of excellence showed higher cross functional activity than that of non-centres of excellence.
**Chart 4-2-11: Level of subsidiary embeddedness to the Japanese market specific demands**

<table>
<thead>
<tr>
<th></th>
<th>Overall Mean</th>
<th>Overall Standard Deviation</th>
<th>Type 1 (CE : Positive Influence) vs (NCE : Positive Influence)</th>
<th>Type 2 (CE : HQ recognition) vs (NCE : HQ recognition)</th>
<th>Type 3 (CE : Subsidiary recognition) vs (NCE : Subsidiary recognition)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develops products meeting specific Japanese market demands</td>
<td>3.22</td>
<td>1.198</td>
<td>3.80 (CE) 3.08 (NCE)</td>
<td>3.70 (CE) 3.09 (NCE) 0.017 (ANOVA)</td>
<td>3.80 (CE) 3.08 (NCE)</td>
</tr>
<tr>
<td>After sales service exclusively for Japanese market</td>
<td>3.52</td>
<td>1.115</td>
<td>3.76 (CE) 3.48 (NCE)</td>
<td>3.74 (CE) 3.48 (NCE) 0.273 (ANOVA)</td>
<td>3.76 (CE) 3.48 (NCE)</td>
</tr>
<tr>
<td>Overall means</td>
<td>3.37</td>
<td>1.03</td>
<td>3.78 (CE) 3.28 (NCE)</td>
<td>3.72 (CE) 3.29 (NCE)</td>
<td>3.78 (CE) 3.28 (NCE)</td>
</tr>
<tr>
<td>Overall ANOVA analysis</td>
<td>NA</td>
<td>NA</td>
<td>0.028</td>
<td>0.049</td>
<td>0.028</td>
</tr>
</tbody>
</table>

[Scale measures: 1 (not at all) to 5 (very strong)]

['CE': 'Centres of Excellence']

['NCE': 'Non-Centres of Excellence']

'Subsidiary embeddedness' in this research measures how well MNC subsidiaries in Japan adapt to the needs of specific Japanese market demands. To measure local
embeddedness, we assumed that ‘product development’ and ‘after sale services’ were key in Japan. This is in line with the findings of JETRO (2008) that more than 60% of MNCs in Japan were trying to develop new products to meet the needs of the Japanese market. Andersson, Björkman, and Forsgren (2005) also examined the degree to which subsidiary embeddedness in the local environment supported knowledge creation.

Overall, MNC subsidiaries in Japan have a relatively high level of embeddedness. Our findings were interesting in light of the earlier discussion of ‘Degree of integration in the MNC’ and ‘Localization’ in Jarillo and Martinez (1990). As we saw, MNC subsidiaries had lower levels of integration, but we see here now that they have moderately high levels of ‘localisation—that is, ‘embeddedness’. This is in line with the findings of Jarillo and Martinez that the more localised the MNC subsidiary, the more likely the subsidiary is not to be integrated in the rest of the MNC network. Their findings are in line with our findings here.

Cronbach’s alpha for this dataset was 0.745; there was no internal validity issue.

ANOVA figures for a comparison of centres of excellence and non-centres of excellence for level of embeddednesses ranged between 0.028 and 0.049, showing a significant difference.

Thus we can infer that level of the embeddedness for the Japanese market is a moderately important factor for MNC subsidiaries in Japan to become centres of excellence subsidiaries.

[Summary]

- **Level of MNC embeddedness in the Japanese market**
  - MNC subsidiaries in Japan seem to have moderately high level of embeddedness in the Japanese market.

- **Comparison between ‘Centres of excellence’ and non-centres of excellence**
  - Overall, centres of excellence have higher embeddedness in the Japanese market than that of non-centres of excellence.
### Chart 4-2-12: Level of competition in local markets for MNC subsidiaries in Japan

<table>
<thead>
<tr>
<th>Overall Mean</th>
<th>Overall Standard Deviation</th>
<th>Type 1 (Centres of Excellence: Positive Influence) vs (Non Centres of Excellence: Positive Influence)</th>
<th>Type 2 (Centres of Excellence: HQ recognition) vs (Non Centres of Excellence: HQ recognition)</th>
<th>Type 3 (Centres of Excellence: Subsidiary recognition) vs (Non Centres of Excellence: Subsidiary recognition)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intense rivalry among business competitors</td>
<td>4.22</td>
<td>0.906</td>
<td>4.24 (CE) 4.22 (NCE)</td>
<td>4.30 (CE) 4.21 (NCE) 0.644 (ANOVA)</td>
</tr>
<tr>
<td>Stringent demands from customers</td>
<td>4.23</td>
<td>0.849</td>
<td>4.28 (CE) 4.22 (NCE)</td>
<td>4.26 (CE) 4.22 (NCE) 0.849 (ANOVA)</td>
</tr>
<tr>
<td>Stringent demands from suppliers</td>
<td>2.48</td>
<td>1.249</td>
<td>2.88 (CE) 2.39 (NCE)</td>
<td>2.82 (CE) 2.39 (NCE) 0.117 (ANOVA)</td>
</tr>
<tr>
<td>Difficulty accessing competent suppliers</td>
<td>2.49</td>
<td>1.296</td>
<td>2.68 (CE) 2.45 (NCE)</td>
<td>2.70 (CE) 2.44 (NCE) 0.345 (ANOVA)</td>
</tr>
<tr>
<td>Difficulty hiring talented people</td>
<td>4.01</td>
<td>1.00</td>
<td>4.28 (CE) 3.95 (NCE)</td>
<td>4.30 (CE) 3.93 (NCE) 0.093 (ANOVA)</td>
</tr>
<tr>
<td>High business operation cost</td>
<td>3.60</td>
<td>0.974</td>
<td>3.84 (CE) 3.54 (NCE)</td>
<td>3.85 (CE) 3.53 (NCE) 0.129 (ANOVA)</td>
</tr>
<tr>
<td>Issue</td>
<td>Mean (CE)</td>
<td>Mean (NCE)</td>
<td>ANOVA (CE)</td>
<td>ANOVA (NCE)</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>-----------</td>
<td>------------</td>
<td>------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Enclosed business human network</td>
<td>3.07</td>
<td>1.148</td>
<td>3.20 (CE)</td>
<td>3.05 (NCE)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.22 (CE)</td>
<td>3.04 (NCE)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.457 (ANOVA)</td>
<td>0.52 (ANOVA)</td>
</tr>
<tr>
<td>Severe governmental regulations</td>
<td>2.63</td>
<td>1.236</td>
<td>2.76 (CE)</td>
<td>2.60 (NCE)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.81 (CE)</td>
<td>2.58 (NCE)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.379 (ANOVA)</td>
<td>0.34 (ANOVA)</td>
</tr>
<tr>
<td>Lack of international level business school for Japanese managers</td>
<td>2.54</td>
<td>1.154</td>
<td>3.20 (CE)</td>
<td>2.39 (NCE)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.11 (CE)</td>
<td>2.40 (NCE)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.004 (ANOVA)</td>
<td>0.006 (ANOVA)</td>
</tr>
<tr>
<td>Overall means</td>
<td>3.16</td>
<td>0.66</td>
<td>3.37 (CE)</td>
<td>3.12 (NCE)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.36 (CE)</td>
<td>3.11 (NCE)</td>
</tr>
<tr>
<td>Overall ANOVA analysis</td>
<td>NA</td>
<td>NA</td>
<td>0.102</td>
<td>0.094</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.036</td>
<td></td>
</tr>
</tbody>
</table>

| Scale measures: 1 (not at all) to 5 (very strong)                     |
| ['CE': 'Centres of Excellence']                                       |
| ['NCE': 'Non-Centres of Excellence']                                  |

‘Level of competition in local markets’ for MNC subsidiaries in Japan is a measure of how seriously MNC subsidiaries in Japan perceive various challenges. Frost, Birknishaw, and Ensign (2002, p1002) define a similar concept: ‘the strength and dynamism of a particular location as providing a ‘latent’ opportunity for multinational firms to derive a learning benefit from that location.’ JETRO’s 2008 survey identified key challenges MNC subsidiaries face. The major challenges identified by MNC subsidiaries, according to JETRO, were ‘Difficulty hiring talented people’, ‘Excessively high cost of business, and ‘Stringent quality demands from customers’.

The overall level of competition reported in local markets in Japan was moderately high. It was particularly high on ‘Difficulty hiring talented people’, ‘Stringent quality demands from customers’, and ‘Intense rivalry among competitors’. These findings were in line with the JETRO survey’s findings. By contrast, there was a very low reported level of competition...
with regard to governmental regulations.

Cronbach’s alpha is 0.799, assuring internal validity. We did not observe any variables significantly undermining internal validity.

Centres of excellence and non-centres of excellence showed no significant difference with regard to the level of competition; ANOVA figures for both type 1 and 3 ranged from 0.036 to 0.102, which is not significant. Only type 3 showed a significant ANOVA figure of 0.036. This shows that, overall, there was no significant difference in the perception of Japan’s competitive market environment between centres of excellence and non-centres of excellence.

At the sub-unit level, we observed a significant difference in the competitive market environment in Japan only with respect to ‘lack of international business schools for Japanese managers’. This is an interesting insight; many MNC subsidiaries in Japan complain about the bad labour market in Japan. However, the MNC subsidiaries that seem to be trying to develop personnel by giving Japanese managers the opportunity to study seem more likely to be the centres of excellence.

[Summary]

∙ **Level of competition in local markets for MNC subsidiaries in Japan**
  - MNC subsidiaries in Japan report a moderately high competitive environment.
  - They face especially high competition with regard to ‘Hiring talented people’, ‘Stringent demands from customers’, and ‘Intense rivalry among competitors’.

∙ **Comparison between centres of excellence and non-centres of excellence**
  - Overall, centres of excellence report facing a tougher competitive environment in Japan than non-centres of excellence.
  - Compared with non-centres of excellence, centres of excellence showed significant differences, especially with regard to the expressed difficulty of finding appropriate international business schools for Japanese managers in Japan.
Chart 4-2-13: Level of sales size, sales ratio, and employee number of MNC subsidiaries

<table>
<thead>
<tr>
<th></th>
<th>Overall Mean</th>
<th>Overall Standard Deviation</th>
<th>Type 1 (CE: Positive Influence) vs (NCE: Positive Influence)</th>
<th>Type 2 (CE: HQ recognition) vs (NCE: HQ recognition)</th>
<th>Type 3 (CEe: Subsidiary recognition) vs (NCE: Subsidiary recognition)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Annual sales of subsidiaries in 2008</strong></td>
<td>14,363M JPY</td>
<td>60.148</td>
<td>21,298M JPY (CE) 11,881M JPY (NCE) 0.483 (ANOVA)</td>
<td>20,157M JPY (CE) 11,993M JPY (NCE) 0.531 (ANOVA)</td>
<td>21.074M JPY (CE) 11,933M JPY (NCE) 0.495 (ANOVA)</td>
</tr>
<tr>
<td><strong>Sales ratio for the JP market in 2008</strong></td>
<td>78.5%</td>
<td>31.385</td>
<td>73% (CE) 80% (NCE) 0.341 (ANOVA)</td>
<td>68% (CE) 82% (NCE) 0.051 (ANOVA)</td>
<td>70% (CE) 81% (NCE) 0.129 (ANOVA)</td>
</tr>
<tr>
<td><strong>Total number of employees for 2008</strong></td>
<td>86.9 people</td>
<td>130.81</td>
<td>146 (CE) 73 (NCE) 0.011 (ANOVA)</td>
<td>137 (CE) 74 (NCE) 0.023 (ANOVA)</td>
<td>145 (CE) 73 (NCE) 0.013 (ANOVA)</td>
</tr>
</tbody>
</table>

[Scale measures: 1 (not at all) to 5 (very strong)]

['CE': 'Centres of Excellence']

['NCE': 'Non-Centres of Excellence']

The annual sales and total number of employees of a given MNC subsidiary is a good indicator of its impact on the creation of a centre of excellence. Also, the sales ratio for the Japanese market is a marker of the internationalisation of relevant MNC subsidiaries. The more globally orientated MNC subsidiaries were, the less we assumed MNC subsidiaries would concentrate on the Japanese market.

The size of our target MNC subsidiaries in Japan was relatively small; the average annual sales were ¥14,363M, and the average number of employees was only 86.9 people. According to figures generated in 2009 by METI, the Japanese government department for industry development, average annual sales of MNC subsidiaries in Japan was ¥15,973M, and the average number of employees was 192. The size of our target
companies in this study was in line with the average overall size of MNC subsidiaries in Japan in terms of sales figures, but smaller in terms of employees. In terms of the overseas exposure of the MNC, our target MNC subsidiaries concentrated on the Japanese market by a ratio of 78.5%. The 2009 METI survey’s ratio was 88%; therefore, our targeted MNC subsidiaries are slightly more international than the average MNC subsidiaries in Japan.

Overall, there was a significant difference between centres of excellence and non-centres of excellence at the level of annual sales ratio for the Japanese market and number of employees.

There was a significant difference in the average number of employees for centres of excellence and non-centres of excellence; the number for the former was far more then double of that of non-centres of excellence. ANOVA figures ranged between 0.011 and 0.013 for all three types. Thus, we can infer that centres of excellence tend to be far bigger that non-centres of excellence.

With regard to level of sales, when we look at the actual figures for all three types, centres of excellence sales are more than double the sales figures of non-centres of excellence. ANOVA figures for all three types ranged between 0.483 and 0.531; there was no significant difference. It is possible to say that centres of excellence tend to have higher sales levels compared with that of non-centres of excellence.

Finally, with regard to the level of sales in Japan versus sales overseas, centres of excellence tend to have a lower level of sales in Japan, meaning centres of excellence tended to have more international exposure than their non-centre of excellence counterparts. However, the difference in the level of sales ratios in Japan between centres of excellence and non-centres of excellence is minimal; ANOVA analysis is 0.341 for type 1 and 0.129 for type 3, neither of which show a significant difference. The ANOVA figure for type 2 scored 0.051, which is significant.

In summary, we can say that centres of excellence tend to be bigger and to have more international exposure compared with non-centres of excellence.
[Summary]

- **Level of sales, the ratio of overseas to in-country sales, and number of employees of MNC subsidiaries in Japan**
  - MNC subsidiaries in Japan are relatively small and more focused on the Japanese market.
  - This study’s target MNC subsidiaries were basically smaller than overall MNC subsidiaries in Japan, especially in terms of number of employees (METI survey in 2009).

- **Comparison between centres of excellence and non-centres of excellence**
  - Overall, centres of excellence tend to have bigger sales, less focus on the Japanese market, and more employees compared with non-centres of excellence.
  - The difference between the two types of subsidiaries was especially significant with regard to ‘Number of employees’.
### Chart 4-3-1: Overview of Independent & Dependent variables

<table>
<thead>
<tr>
<th>Autonomy</th>
<th>[TYPE 1]</th>
<th>[TYPE 2]</th>
<th>[TYPE 3]</th>
<th>Overview of difference between centres of excellence and non-centres of excellence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entering new markets outside of Japan</td>
<td>Significance/ANOVA (Between ‘Positive influence’ centres of excellence &amp; non-centres of excellence)</td>
<td>0.848</td>
<td>0.853</td>
<td>Not significant</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.028</td>
<td>Significant</td>
</tr>
<tr>
<td>Scope expansion over 3Y</td>
<td></td>
<td>0.001</td>
<td>0.001</td>
<td>Significant</td>
</tr>
<tr>
<td>- R&amp;D</td>
<td></td>
<td></td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>- Manufacturing-</td>
<td></td>
<td></td>
<td>0.002</td>
<td>Significant</td>
</tr>
<tr>
<td>Subsidiary links to sources of MNC internal competence / Knowledge flow</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Specific corporate research unit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.014</td>
<td>Significant</td>
</tr>
<tr>
<td>- Specific external supplier</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.003</td>
<td>Significant</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.011</td>
<td>Significant</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>----------------</td>
</tr>
<tr>
<td><strong>external research unit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cross functional</strong></td>
<td>0.220</td>
<td>0.123</td>
<td>0.129</td>
<td>Not significant</td>
</tr>
<tr>
<td><strong>Japan market specific demands</strong></td>
<td>0.028</td>
<td>0.049</td>
<td>0.028</td>
<td>Significant</td>
</tr>
<tr>
<td>- Develops new products for Japan</td>
<td></td>
<td>0.017</td>
<td></td>
<td>Significant</td>
</tr>
<tr>
<td><strong>Level of information integration</strong></td>
<td>0.175</td>
<td>0.117</td>
<td>0.216</td>
<td>Not significant</td>
</tr>
<tr>
<td><strong>Level of process integration</strong></td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>- Purchasing</td>
<td></td>
<td>0.020</td>
<td></td>
<td>Significant</td>
</tr>
<tr>
<td>- Manufacturing</td>
<td></td>
<td>0.002</td>
<td></td>
<td>Significant</td>
</tr>
<tr>
<td>- R&amp;D</td>
<td></td>
<td>0.000</td>
<td></td>
<td>Significant</td>
</tr>
<tr>
<td><strong>MNC investment to subsidiary over 3Y</strong></td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>- Basic research</td>
<td></td>
<td>0.000</td>
<td></td>
<td>Significant</td>
</tr>
<tr>
<td>- Application</td>
<td></td>
<td>0.016</td>
<td></td>
<td>Significant</td>
</tr>
<tr>
<td>- Product development</td>
<td></td>
<td>0.000</td>
<td></td>
<td>Significant</td>
</tr>
<tr>
<td>- Production</td>
<td></td>
<td>0.001</td>
<td></td>
<td>Significant</td>
</tr>
<tr>
<td>- Logistics</td>
<td></td>
<td>0.009</td>
<td></td>
<td>Significant</td>
</tr>
<tr>
<td><strong>Local market competitive environment</strong></td>
<td>0.102</td>
<td>0.094</td>
<td>0.036</td>
<td>Not significant except [TYPE 3] Significant</td>
</tr>
<tr>
<td>- Lack of business school access</td>
<td></td>
<td></td>
<td>0.004</td>
<td>Significant</td>
</tr>
</tbody>
</table>
‘Total number of employees’, ‘MNC investment in subsidiaries over three years’, ‘Level of process integration’, ‘Japan-market-specific demands’, and ‘scope expansion over three years’ are the variables that most clearly differentiate between centres of excellence and non-centres of excellence.

Overall tendencies of ‘centres of excellence subsidiaries’ revealed by this analysis are as follows.

1) **Centres of excellence tend to expand continuously.**
   - Significantly higher level of ‘Scope expansion over three years’ compared with that of non-centres of excellence.
     - especially in the areas of ‘R&D’ and ‘Manufacturing’
   - Significantly higher ‘HQ investment in the subsidiary over three years’ compared with non-centres of excellence.

2) **Centres of excellence tend to connect to each other well.**
   - Significantly higher level of ‘Japanese market specific demands’ compared with non-centres of excellence.
     - especially ‘Developing products suited to the Japanese market’.
   - Significantly higher ‘Level of process integration’ compared with non-centres of excellence.
     - especially on the areas of ‘Purchasing process’, ‘Manufacturing process’, and ‘R&D activities’.
3) **Centres of excellence tend to be larger.**
   - Significantly higher ‘Total number of employees’ comparing with non-centres of excellence.

4) **Centres of excellence do not necessarily have more autonomy.**
   - No significant differences in this area compared to non-centres of excellence.

Frost, Birkinshaw, and Ensign (2002) observed similar trends. Our finding that ‘centres of excellence subsidiaries tend to expand continuously’, comports with their finding that ‘Investment by the parent firm stands out for its high correlation with all three types of centres.’ We observed a significant difference between centres of excellence and non-centres of excellence especially in the areas of ‘R&D’ and ‘Manufacturing’ for ‘Scope expansion over three years’, and ‘Basic research’, ‘Application engineering’, ‘Production’, ‘Products development’, and ‘Logistics’ for ‘HQ investment in subsidiaries over three years.

Our second point, ‘Centres of excellence subsidiaries tend to connect to each others well’, is supported by Jarillo and Martinez (1990)’s finding that ‘Active subsidiaries’ (close to our concept of centres of excellence and Bartlett and Ghoshal’s ‘transnational’ subsidiary) satisfied both ‘Degree of integration’ and ‘Degree of localisation’ well. We observed a significant difference between centres of excellence and non-centres of excellence especially in the areas of ‘Developing products suitable for the Japanese market’, ‘Japanese market specific demands’, as well as ‘Purchasing process’, ‘Manufacturing process’, and ‘R&D activities’ for ‘Level of process integration’.

We observed a slightly different picture for point three. Andersson and Forsgren (2000) found in their study of MNC subsidiaries that subsidiary size does not have any bearing on subsidiary importance. Frost, Birkinshaw, and Ensign (2002) found that most centres of excellence sales and employee figures were lower than non-centres of excellence. However, we found that centres of excellence tended to differ significantly from their non-centre of excellence peers. As Andersson, Forsgren, Frost, Birkinshaw, and Ensign found in their analyses of MNC subsidiaries outside of Japan, and as we have found in our study of MNC subsidiaries in Japan, regional differences may be the source of these disparities.

In contradiction to our final, fourth point—that centres of excellence do not necessarily need significantly more autonomy compared to non-centres of excellence—Cantwell and Mudambi (2005) found that a given subsidiary’s strategic independence (we can interpret
this as autonomy) appears to significantly increase the probability of gaining a centre of excellence mandate. However, Frost Birkinshaw, and Ensign (2002, p1009) found that ‘Overall, there do not appear to be major differences in the autonomy levels experienced by any of the different types of unit (centres of excellence). Autonomy, in particular, appears to bear little relationship to centre of excellence formation in our data.’ From our findings, which are also supported by Frost, Birkinshaw, and Ensign (2002), we can infer that less autonomy means that these subsidiaries are well connected to corporate HQ, and this could have allowed MNC subsidiaries to receive greater levels of CAPEX and other resources from their HQ in return.

In summary, MNC centres of excellence in Japan tend to expand their scope continuously, tend to be bigger and to connect to each other relatively well within the MNC network, and tend to have less autonomy compared to non-centres of excellence in Japan.
[Chapter 5: Key results]

1. Introduction
We started our initial data examination in chapter 4 with descriptive analysis to understand the basic nature of our data. In chapter 5, we will use regression analysis to investigate the relationship between the dependent and independent variables in more depth, applying it to the three types of centres of excellence: Type 1 (MNC Positive influence), Type 2 (HQ recognition), and Type 3 (Subsidiary recognition). Then we will test our hypotheses.

We first conducted regression analysis among all the independent variables in a single category (such as ‘Subsidiary level determinants’, ‘Head office level determinants’, and ‘Local level determinants’) and the dependent variables. The main purpose of this step was to identify key independent variable(s) for each category. After identifying the key independent variable(s) in each category, we constructed a model to execute an overall regression analysis between those particular independent variables and the dependent variables.

Based on the findings of the regression model, we discuss the findings, comparing them with the hypotheses we presented initially in order to articulate the independent variables that had the most direct impact on the formation of centres of excellence based on the three types outlined above. These findings form the heart of our study.

2. Methodological steps
As a first step, we categorised the independent variables into three groups: ‘Subsidiary level determinants’, ‘Head office level determinants’, and ‘Local level determinants’ (charts 5-3-1, 5-3-2, 5-3-3). We categorised these independent variables this way because ‘a favourable combination of locational, subsidiary level and head office level conditions will make competent subsidiaries.’ (Cantwell, Mudambi, 2005).


For regression analysis, when we focus on ‘Subsidiary level independent variables’ (chart
we can see that ‘Entering new markets outside of Japan’ is the most significant independent variable in the ‘Autonomy’ sub-group, ‘R&D work expansion’ is the most significant independent variable in the ‘3Y expansion’ sub-group, and ‘Number of employees’ is the most significant variable in the ‘Employee’ sub-group. We used 0.05 as the cutoff for significance.

After identifying the key independent variable for each group for the subsidiary level, head office level, and local level determinants, we conducted an overall regression analysis between dependent variables and independent variables (chart 5-4-1). Through this two-step regression analysis, we were able to identify the key independent variables forming three types of centres of excellence subsidiaries. Frost, Birkinshaw, and Ensign (2002) took a similar approach.

We also conducted a robustness check of our analysis by shifting the cutoff criteria for centres of excellence similar to the robustness check Frost, Birkinshaw, and Ensign describe conducting for their analysis (2002). For our original regression analysis, we selected three types of centres of excellence where each type must score above 3 out of 5 on the following dependent variables: ‘Basic research competence’, ‘Product development competence’, and ‘Products of goods and service competence’. To strengthen our model’s reliability, we lowered the cutoff criteria for centres of excellence to scores above 2 out of 5 on ‘Basic research competence’, ‘Product development competence’, and ‘Products of goods and service competence’ for each type. As we can see from chart 5-2-1, there was not a strong match between the two models in terms of ‘Subsidiary level determinants’ and ‘Head office level determinants’, but there was a strong overlap for ‘Local level determinants’, and especially for ‘Subsidiary links’.

To view the robustness of our model from another perspective, we also categorised subsidiaries into two groups based on ‘Green field subsidiary’ or ‘Non-green field subsidiary’ instead of centres of excellence classified based on Type 1 ‘MNC Positive influence subsidiaries’, Type 2 ‘HQ recognition subsidiaries’, and Type 3 ‘Subsidiary recognition subsidiaries’. The results of this robustness check showed a different tendency compared with the previous one (chart 5-2-1). Although this robustness analysis indicated that CAPEX for basic research, which is a part of ‘Head office level determinants’, is significant for the formation of centres of excellence subsidiaries, the model also showed that ‘Size of company (Employee number)’, ‘Information integration’, and ‘Cross functional function’ are also significant.
From this robustness check the general trends do not look significantly different, especially when we compare the original model and the other two models generated by shifting the cutoff criteria for identifying centres of excellence subsidiaries. This trend was especially strong for ‘Subsidiary links’ related independent variables.

We concluded that the robustness of our model was preserved.

3. Identification of key determinants

In order to identify key independent variable determinants, groups of independent variables are classified into three macro level groups: ‘Subsidiary level determinants’, ‘Head office level determinants’, and ‘Local level determinants’.

When we conducted regression analysis between each group of independent variables and dependent variables, we arrived at the results in charts 5-3-1, 5-3-2, and 5-3-3. In these charts, we highlight the applicable independent variables when they are significant, meaning the significance figures are less than 0.05, the figure considered the cutoff. From this regression analysis we were able to identify independent variables that were significant, and we used these for the overall regression model analysis which was conducted next.
We identified the key independent variables as follows: ‘Autonomy to enter new markets outside of Japan’ scored significantly for all three types of centres of excellence, with a range from 0.02 to 0.05. We can infer that ‘Autonomy to enter new markets outside of Japan’ has significant influence on the creation of centres of excellence.

Looking at the ‘Expansion over three years’ independent variables group, only ‘Expansion of R&D over three years’ scored as significant, with scores of less than 0.05 for all three types of centres of excellence; other independent variables were less significant (scores higher than 0.2). Thus, we can infer that ‘Expansion of R&D over three years’ is the only significant influence on the creation of centres of excellence within this ‘Expansion over three years’ sub-group.

The ‘Number of employees’ sub-group showed strong significance (scored less than 0.05) for all three types of subsidiaries, indicating that the size of the subsidiaries is an important factor for the creation of centres of excellence. ‘Sales outside of Japan’ also showed valid significance for Type 2 (HQ recognition) centres of excellence, with a significance level of 0.05.

Thus, from ‘Subsidiary level determinants’, we identified ‘Entering new markets outside of Japan’, ‘Expansion of R&D over three years’, ‘Sales outside of Japan’, and ‘Number of employees’ as independent variables to be tested in the third round of the overall regression model.
In terms of ‘Subsidiary level determinants’ (chart 5-3-2), we identified the following key independent variables. In the ‘CAPEX’ sub-group, ‘CAPEX in Basic research’ showed the most significance within the group, but significance scores ranged between 0.14 and 0.18 for all three types of centres of excellence. Thus, we can assume that a higher level of CAPEX for subsidiaries is not necessarily significant for creating centres of excellence.

Frost, Birkinshaw, and Ensign (2002) posit a positive relationship between parent firm investment and the formation of centers of excellence based on their own regression model analysis. Although we could not observe significant effects of CAPEX on the creation of centres of excellence, we decided to keep ‘CAPEX in basic research’ for the third step of the overall regression model to check on the significance of this variable on creating centres of excellence.

Of the independent variables in the ‘Process integration’ sub-group, only ‘Integration of R&D functions within the MNC’ showed significance in the creation of centres of excellence, showing a significance level mostly below 0.05 for all three types of centres of excellence. It should be noted that both of the elements that show significance for the creation of centres of excellence at the ‘Subsidiary level’ as well as the ‘Head office level’ are related to R&D. Cantwell and Mudambi (2005) also point out that the average level of R&D intensity is considerably higher for units with the subsidiary mandate. As an independent variable in the ‘Cross functional activities’ group it was not found significant for the formation of centres of excellence, as the applicable significance figures only ranged from 0.1 to 0.2 for all three types of centres of excellence. However, as there was only one independent variable in this group, we kept it for the overall regression model.
The same logic preserved the independent variable ‘Technical information’ within the ‘Information integration’ sub-group as none of the four independent variables showed strong significance for any of the three types of centres of excellence, but ‘Information integration’ showed the strongest significance within this sub-group, so we decided to keep it for the overall regression analysis.

From ‘Head office level determinants’, we identified the following independent variables: ‘CAPEX for Basic research’; ‘Process integration of R&D functions’; ‘Information integration of technical information’; and ‘Global cross-functional team formation’ for analysis in the overall regression model.

We identified key independent variables from ‘Local level determinants’ (chart 5-3-3). Within this sub-group, ‘Stringent demands from suppliers in Japan’ has some slight significance for the creation of centres of excellence as significance figures ranged between 0.095 and 0.145 for Type 1 (Positive influence) and Type 2 (HQ recognition) centres of excellence. Frost, Birkinshaw, and Ensign’s findings support this result; they did not see a strong relationship between conditions in the local business environment and the formation of centres of excellence (2002). However, as we needed to check the impact of independent variables within the ‘Local market competitiveness’ sub-group, we kept ‘Severe demands from suppliers in Japan’ to be tested in the overall regression analysis.
Three of the subsidiary links independent variables—‘Subsidiary links to specific external customers’, ‘Subsidiary links to external specific suppliers’, and ‘Subsidiary links to government institutions’—were significant in the formation of centres of excellence; they generally scored below 0.05 for all three types of centres of excellence. We concluded that ‘Subsidiary links’ was one of the most significant elements for centres of excellence. Giroud and Kennet (2007) states that ‘linkages can be separated into three main groups: (1) supply chain linkages with either suppliers or customers/agents, (2) collaborative linkages with other firms such as alliance partners or competitors and (3) institutional linkages with governments, research institutes, industry organisations and universities.’ ‘Supply chain linkage’ is significantly important for forming centres of excellence.

For the ‘Subsidiary embeddedness’ group of independent variables, ‘Develops products meeting specific Japanese market demands’ showed certain significance for creating centres of excellence; significance figures ranged from 0.01 to 0.04 for all three types of centres of excellence. This is in line with the story told by Bartlett and Ghoshal (1998) mentioned earlier about Phillips’s failure to establish a substantial marketing division for its subsidiaries in Japan and its dismal record of keeping up with new developments. We kept ‘Develops products meeting specific Japanese market demands’ as an independent variable to be tested for the overall regression analysis.

Overall, from ‘Local level determinants’, we identified the following independent variables: ‘Severe demands from suppliers’; ‘Lack of international level business school for Japanese managers’; ‘Subsidiary links with specific external customers’; ‘Subsidiary links with specific external suppliers’; ‘Subsidiary links with governmental institutions’; and ‘Develops products meeting specific Japanese market demands’.

4. Testing with reduced models
After conducting the overall regression analysis, we determined which independent variables were key for the formation of centres of excellence (chart 5-4-1). We conducted an overall regression analysis with these independent variables. We also generated B values for each independent variable. The B values were tested in order to identify whether the independent variables were positively or negatively correlated with the dependent variables.
We categorised the results as significant when the independent variables scored less than 0.1 (chart 5-4-1) for all three types of centres of excellence. Based on this classification, the following independent variables were considered significant.

In terms of subsidiary level determinants, ‘R&D expansion over 3 years’ had significance of between 0.017 and 0.044 for all three types of centres of excellence. We identified this as the most relevant independent variable for the formation of centres of excellence.

In terms of head office determinants, ‘Good process integration on R&D work within the MNC’ had a significance between 0.038 and 0.092. We identified this as the most relevant independent variable for the formation of centres of excellence.

In terms of local level determinants, subsidiary links to ‘Specific external customers’, ‘Specific external suppliers’ and ‘Government institutions’ showed significance of less than 0.005 for all three types of centres of excellence, except in one case. This is the most relevant independent variable for the creation of centres of excellence.

The B value is negative for subsidiary links to ‘Specific external customers’ and ‘Government institutions’ (chart 5-4-1), meaning such links are negatively correlated with the formation of centres of excellence.

This means that ‘centres of excellence’ tend to develop their competences when they have more influence from external suppliers, but tend not to develop their competences when they have more influence from a specific external customer or a government institution.
Many subsidiaries would characterise themselves as having strong ties with particular customer without those ties necessarily impacting the development of a subsidiary’s capabilities. (Frost, Birkinshaw, and Ensign, 2002)

In terms of R square (chart 5-4-1), for the analysis of type 1, between 31.3% and 50.5% of variables were explained; for type 2 between 31.2% and 49.3% of variables were explained; and for type 3 between 30.8% and 49.9% variables were explained.

5. Result and discussion of hypotheses

As we can see from chart 5-5-1, we have discovered that ‘centres of excellence’ in Japan are MNC subsidiaries having entrepreneurial R&D work scope expansion in the past 3 years, good R&D process integration with the rest of the MNC, a good level of CAPEX from its HQ for its basic R&D, and having good links with external suppliers. This result shows that ‘centres of excellence’ in Japan need to have prime capabilities, especially in the area of R&D.

At the same time, this finding shows that ‘centres of excellence’ in Japan need all three key determinants—‘Subsidiary level determinants’, ‘Head office determinants’, and ‘Local level determinants’—at the same time. Successful MNC subsidiaries need to have balanced competence; they should not only rely on the head office or on their own subsidiary. It also shows quite clearly that to become centres of excellence, subsidiaries must know how to form effective external linkages with external suppliers.

Chart 5-5-1: Key independent variables for the formation of ‘centres of excellence’ in Japan]
This finding is substantially in line with the findings of Frost, Birkinshaw, and Ensign (2002) who have analysed ‘centres of excellence’ among MNC subsidiaries in Canada. They also found that ‘Autonomy’, ‘local market competitiveness’, and ‘size of subsidiary’ were not significant for the creation of ‘centres of excellence’. Andersson and Forsgren (2000) also found that ‘size of subsidiary’ had no significance for the creation of ‘Centres of Excellence’.

Frost, Birkinshaw, and Ensign (2002) discovered that ‘CAPEX’ initiated by HQ for MNC subsidiaries, ‘Internal linkage’, and ‘External linkage’ are also crucial for the creation of ‘centres of excellence’. Andersson and Forsgren (2000), who have studied MNC subsidiaries in Sweden, analysed the importance of MNC subsidiaries external linkages on the formation of ‘centres of excellence’ as well. Cantwell and Mudambi (2007), who studied MNC subsidiaries in the UK, also point out the prime importance of parent firm investment for R&D centres for the creation of competent MNC subsidiaries, and find that these competent MNC subsidiaries tend to have more R&D intensity.

We can conclude that in order to form centres of excellence in Japan, both continuous R&D expansion initiated by both HQ and subsidiaries as well as R&D process integration with the rest of MNC are crucial. Strong ties with good suppliers enabling the subsidiary to be competitive in its own market are also necessary.

One striking finding of the present study is that the basic elements needed for the creation of ‘centres of excellence’ in Japan are not very different from those created in the UK, Canada or Sweden. Thus, we can infer that insight into the creation of ‘Centres of Excellence’ in those countries can help create ‘centres of excellence’ in Japan as well.

After overlooking the general trends of ‘centres of excellence’ in Japan, we also observed the key characteristics of each type of ‘centre of excellence’ in Japan.

As we can see from charts 5-5-2, 5-5-3, and 5-5-4, all three types of centres of excellence had in common ‘Internal linkages’ in terms of ‘Good R&D process integration’, as well as ‘External linkage with a specific external supplier’, as we saw in chart 5-5-1, as key characteristics. Also, CAPEX by HQ for basic research is applicable for both Type 2 and 3 centres of excellence.
As we discussed earlier, we can see in chart 5-5-2 that Type 1 ‘centres of excellence’ in Japan—those that exercise positive influence over the rest of their MNC counterparts—are almost in line with the general picture of overall ‘centres of excellence’ in Japan except that they show a slightly weaker impact from HQ CAPEX on basic research.

However, a key characteristic of Type 1 ‘centres of excellence’ in Japan is that, compared with the other 2 types, they are especially cognizant of the need to train their local Japanese managers to become internationally competent by sending them to high level international level business school in Japan (chart 5-4-1). We believe that this kind of characteristic of Type 1 ‘centres of excellence’ is one of the things that explains their influence on the rest of the MNC.

[Chart 5-5-3: Key independent variables for the formation of ‘Type 2: centres of excellence’ in Japan]
As we can see from chart 5-5-3, Type 2 of ‘Centres of excellence’ in Japan are highly recognised by their MNC HQ. They show the general characteristics of ‘centres of excellence’ in Japan with one key difference.

Type 2 ‘centres of excellence’ tend to seek more sales activity outside of Japan. These ‘centres of excellence’ tend to make more sales outside of the Japanese market, a characteristics not observed in the other two types of ‘centres of excellence’.

The finding that subsidiaries that try to expand their responsibilities and give tangible benefits to MNC tend to win higher recognition from HQ is an interesting one. Subsidiaries trying to stretch their boundaries will win more recognition and gain high levels of CAPEX especially in terms of basic research and will become more competent subsidiaries. We observe the positive cycle of these competent subsidiaries.

[Chart 5-5-4: Key independent variables for the formation of ‘Type 3 centres of excellence’ in Japan]

Type 3 ‘Centres of excellence’ with high levels of recognition by other subsidiaries in the MNC show similar characteristics to the general picture of overall ‘centres of excellence’ in Japan.

The existence of cross functional transmission channels has some impact on the formation of Type 3 ‘centres of excellence’. Although not too significant, we can infer that subsidiaries trying to initiate better communication with the rest of the MNC’s subsidiaries tend to become type 3 ‘centres of excellence’.

After an overview of the types of ‘Centres of excellence’ in Japan, we would like to go through on the key independent variables and their impacts on the formation of ‘centres of excellence’, and review how our hypotheses are supported.
As can be seen in chart 5-4-1, ‘Autonomy’ has only weak effects on the formation of centres of excellence for all three types. However, according to major researchers such as Birkinshaw et al. (1998), Andersson and Forsgren (2000), and Cantwell and Mudambi (2005), the more autonomy a subsidiary has, the greater the likelihood that it can form relationships with other local companies and institutions. Cantwell and Mudambi (2005) make a parallel observation: ‘a subsidiary’s strategic independence (especially in terms of HR management and marketing) also appears to significantly increase the probability of gaining a centres of excellence mandate’.

Nonetheless, Frost, Birkinshaw, and Ensign (2002, p1013) noted in their ‘Centers of excellence’ model that ‘Autonomy’ had very small impacts on the creation of any of the three types of ‘centers of excellence’, as all the relevant significance figures scored above 0.05. ‘Achieving recognition as a center of excellence may involve a kind of Faustian bargain for the subsidiary,’ they state; ‘more investment, more responsibility, but less autonomy to act independently in key decision areas.’ Thus, our hypothesis 1—*The higher the subsidiary’s autonomy, the higher its likelihood of becoming a Centre of Excellence*—was not supported, as autonomy showed no significant correlation for any of the three types of centres of excellence.

‘CAPEX’ (chart 5-4-1), especially ‘Basic research’, has a moderate impact on creating centres of excellence. Frost, Birkinshaw, and Ensign (2002) have identified this variable as significant for the creation of all three types of centres of excellence. Our regression analysis, by contrast, scored below 0.05 only for Type 2 centres of excellence (HQ recognition); Type 1 centres of excellence (Positive influence within MNC) and Type 3 centres of excellence (Subsidiary recognition) showed significance levels of between 0.05 and 0.10. ‘Competitively stronger MNCs are more likely to locate R&D abroad, and to evolve toward a greater variance in the levels of R&D across their subsidiaries, with R&D becoming concentrated in sites where local conditions are most conducive to technology creation’ (Cantwell and Kosmopoulou, 2002). Thus, our hypothesis 2—*The greater the HQ’s investment in the subsidiary to enhance its activities and/or competences, the higher the likelihood of its becoming a centre of excellence*—was mainly supported.

For ‘Subsidiary embeddedness’, especially ‘Product development meeting specific Japanese market demands’, there was only very weak influence on the formation of centres of excellence (chart 5-4-1). ‘Non-mandated subsidiaries are simply trying to adapt products to local markets and resource conditions. Subsidiaries with Centres of excellence
mandates are all heavily committed to their creative tasks’ (Cantwell, Mudambi, 2005). However, astonishingly, there were only 17 MNC subsidiaries (i.e., in the manufacturing sector) in Japan which had basic research centres in 2006 (Jetro, 2008). Thus, our hypothesis 3—‘The higher the degree of a subsidiary’s embeddedness, the higher its likelihood of becoming a centre of excellence’, and ‘The higher the degree of adaptation of the subsidiary to the Japanese market, the higher its likelihood of becoming a centre of excellence’—was not supported.

Independent variables relating to ‘Subsidiary links’ such as ‘subsidiary links with specific external customers’, ‘Subsidiary links with specific external suppliers’, and ‘Subsidiary links with government institutions’ all showed an overall average significance below 0.05. Andersson and Forsgren (2000) have also identified a strong linkage between ‘Subsidiary links’ in terms of ‘External customers’ and ‘External suppliers’ and ‘Centers of excellence’. However, we found (chart 5-4-1) that for the variables ‘Specific external customers’ and ‘Government institutions’, B values were minus, meaning that the stronger the subsidiary links in these areas, the less likely subsidiaries were to form centres of excellence. To understand this phenomenon, it is important for us to return to the original questionnaire’s assessment of subsidiary links. We asked respondents ‘To what extent have the following stakeholders influenced the development of core competences of your firm?’ for ‘Specific external customers’, ‘Specific external suppliers’, and ‘Government institutions’. We can infer that the Japanese subsidiaries’ reported core competences were strengthened under the influence of ‘Specific external suppliers’, but were weaker under the influence of ‘Specific external customers’ and ‘Government institutions’. We assume this discrepancy arises mainly because Frost, Birkinshaw, and Ensign 2002 ‘Centers of excellence’ targeted MNC subsidiaries in Canada, while we targeted MNC subsidiaries in Japan. According to the 2008 JETRO survey, which targeted 864 MNC subsidiaries in Japan, 59.8% of them responded that Japanese clients’ demands regarding product quality were excessively high. At the same time, 21.2% responded that it was difficult to get adequate governmental support, especially when seeking regulatory approval. We assume that cultural characteristics of the Japanese market contribute to these distinctive results.

‘Cross functional mechanism’ (chart 5-4-1) had no significant effects on creating centres of excellence. Cross functional mechanisms can be considered transmission channels that facilitate knowledge flow. Gupta and Govindarajan (2000) define transmission channels as essential for the flow of knowledge in MNCs, but distinguish between formal and informal transmission channels. They found that formal transmission channels enhance knowledge
flow within the MNC. We can posit two reasons for our results. One could be that 'strong local dispersion makes coordination difficult and may deter transfers of knowledge' (C. Ambos and B. Ambos, 2009). Another could be that MNC subsidiaries in Japan depend more on informal transmission channels.

Thus, our Hypothesis 4, ‘The stronger the subsidiary's linkage with its internal / external sources of competence, the higher its likelihood of becoming a centre of excellence’ and ‘The higher the level of a subsidiary’s transmission channel level enabling better knowledge flow, the higher its likelihood of becoming a centre of excellence’, was partially supported. Hypothesis 4 was more strongly supported when subsidiaries had strong linkages with external players such as external suppliers.

‘Information integration’, and in particular ‘Technical information (chart 5-1), had no significance in the formation of centres of excellence. The roles of subsidiaries are driven by the special circumstances of their locations (Cantwell and Mudambi, 2005); our results probably stem from our target MNC subsidiaries locations in Japan, where they need technical information specific to Japan. Sumelius and Sarala (2008) found that the location of subsidiaries had significant effects on technical information outflow within the MNC.

We discovered that ‘Process integration’, especially in terms of ‘R&D functions’, as we can see from chart 5-1, had some effects on creating centres of excellence. Cantwell and Mudambi (2005, p1111) identify that ‘R&D strategies in competence-creating subsidiaries are supply-driven, while those in competence-exploiting subsidiaries are purely demand-driven’. Thus, to make MNC subsidiaries centres of excellence and preserve their supply-driven capability, we can infer that MNC subsidiaries must make sure their R&D functions are connected to the rest of MNC’s R&D network to keep them competitive.

Our Hypothesis 5, ‘The greater the degree to which the subsidiary is integrated in the MNC system and the more its activities are aligned with the rest of the MNC, the higher its likelihood of becoming a centre of excellence’ was partially supported. This hypothesis was especially supported for R&D process integration.

As chart 5-4-1 shows, we found that entrepreneurial scope expansion had an especially strong impact on the formation of ‘centres of excellence’, especially in the R&D work area. We conclude this from the fact that even if subsidiaries receive resources such as CAPEX from HQ, if they do not have the will to fully utilise these resources to improve their capabilities, the resources are as good as useless. Indeed, while giving tangible assets
such as CAPEX is a crucial mission of HQ within the MNC, developing entrepreneurial capability is a crucial mission for the subsidiary if it is to become a ‘centre of excellence’. (Frost, Birkinshaw, Ensign, 2002)

Thus, Hypothesis 6- ‘The higher the subsidiary’s level of scope expansion, the higher its likelihood of becoming a centre of excellence.’ – was strongly supported.

As exemplified by Porter’s ‘Diamond’ theory (1990), management study has started to focus on the importance of competitive market environments as an important influence on the formation of more competent subsidiaries. It has been posited that the more competitive the market is, the more likely subsidiaries operating within that market are to gain the competence they need to survive in harsh conditions. Indeed, nearly 60% of MNC subsidiaries in Japan say that the Japanese market is very demanding and competitive. (JETRO, 2008).

However, as we can see from chart 5-4-1, we found that market competitiveness had no influence on the formation of ‘centres of excellence’. This is also a very interesting phenomenon. Although they are in a competitive market, most of these subsidiaries say it is unnecessary to adapt themselves to tough market demands.

We infer this from our study, and it is also supported by the facts: only 41% of MNC subsidiaries in Japan thought that the Japanese market was too demanding in terms of product quality in the 1990’s, and this number crept up to just 44% in the following decade. (JETRO, 2008)

Thus, Hypothesis 7- ‘More competitive the subsidiary’s local market environment, the higher its likelihood of becoming a centre of excellence.’ – was not supported.

We assume that the size of a given subsidiary will govern its presence and influence in the rest of MNC (Ghoshal and Nohria, 1989, Frost, Birkinshaw, and Ensign, 2002). However, we find that the size of subsidiaries has very weak effects on the formation of ‘centres of excellence’ in Japan. This can be observed in chart 5-4-1.

Perhaps this has its source in a special characteristic of subsidiaries in Japan: many of them do not have basic R&D facilities in Japan. Only 15% have basic R&D facilities in the country; other MNCs say they do not intend to open such facilities in Japan in the future (JETRO, 2008).
Enhancing basic R&D facilities and maintaining investment in this area is crucial for the formation of ‘centres of excellence’. It may be that many subsidiaries in Japan, while of a respectable size, lack core functions such as R&D capability which would allow them to form centres of excellence.

Thus, Hypothesis 8— ‘The larger the subsidiary’s size, the higher its likelihood of becoming a centre of excellence.’ – was not supported.

In summary, we discover that the elements needed for the formation of ‘centres of excellence’ in Japan are not fundamentally very different from those in European and US markets.

However, we have also discovered some key characteristics associated with the Japanese market for the formation of ‘centres of excellence’.

First, ‘centres of excellence’ in Japan tend to have weaker specific links with external customers, but stronger links with external suppliers. This is probably because Japanese clients are sometimes too demanding (JETRO, 2008). Submitting too much to a subsidiary’s Japanese clients’ demands in terms of quality, delivery terms, and price levels may be detrimental, and probably keeping a healthy distance from them might be more likely to create a ‘centre of excellence’ in Japan. However, it looks as if external suppliers try to navigate these subsidiaries in Japan in order to get into the local market, and having good ties with them on the contrary gives subsidiaries more advantages. (JETRO, 2008)

Second, ‘centres of excellence’ in Japan are looking for world-class international business schools. According to the Financial Times MBA rankings (2012), there are no Japanese business schools even in the top 100. Although many subsidiaries are located in Japan, more than 65% expressed dissatisfaction with the availability of competent employees there; furthermore, subsidiaries have no access to the kind of proper educational institutions that can transform less-competent people in their organisation.
[Chapter 6: Conclusion]

We believe the biggest shock wave in the Japanese international business arena in the last two decades was created by Carlos Ghosn. He served as top management for Nissan on behalf of Renault there for a decade. Japanese viewed this management revolution with enormous shock and admiration. Some called it a management revolution in Japan, and Nissan became a centre of excellence for the Renault group. Carlos Ghosn was the one who provided the impetus to execute structural change in Japanese and western companies at the corporate level.

Obviously, good management is like craftsmanship, as Carlos Ghosn says. We do not have a superb, fixed methodology to improve management systems. However, we believe that there are certain suggestions we can utilise to improve the operation of companies. What Carlos Ghosn did was to re-set Nissan’s external and internal linkages through cross-functional activities, and to focus on R&D activities to prepare for the future. His priorities overlapped with the findings of our study, and his achievements inspired it.

The initial motivation for this research was to identify areas which might aid in revitalising the ailing Japanese economy. We started by looking at several key areas which might have an impact on further development of the Japanese economy. The discovery that FDI inflow level into Japan is very limited compared with that of the other G7 countries, and that it is shrinking, not growing, is very discouraging.

Thus, we analysed the activities of foreign MNC subsidiaries in Japan in order to better understand how to accelerate the expansion of such subsidiaries in the Japanese market. To give guidance to foreign MNC subsidiaries in Japan and to help HQ articulate their strategic direction, we identified centres of excellence among foreign subsidiaries and the key influential factors responsible for their formation. In the end, clarifying these strategies should help initiate more FDI inflow into the Japanese market by giving potential MNC investors insight into the Japanese market and giving Japanese government and other relevant authorities help attracting more inward FDI to Japan.

An equally important objective is the identification of elements which are crucial for the creation of ‘centres of excellence’ in Japan. The encouragement of these centres benefits Japanese society, but is also in the interest of the MNCs themselves. Remember that the MNC is engaged not only in international production, but also in the exchange of information and activities as well. (Forsgren, Holm, and Johanson, 2005) It is clear from
this perspective that MNCs would lose their reason for being if individual, smaller companies out-performed them. To form strategically and internationally competent MNCs, it is important these MNCs have superior sets of subsidiaries—in other words, ‘centres of excellence’.

Some researchers argue that two key factors are necessary for the development of ‘centres of excellence’. The first is ‘Importance of local markets’, and the second is ‘Capability of the local subsidiary’ (Bartlett and Ghoshal, 1998). 60% of MNCs whose Japanese subsidiaries function as regional headquarters mention that Japan is the most important market for them in Asia (JETRO, 2008). Thus, we can say that the condition ‘Importance of local markets’ is met, and we may turn to analysing the conditions that enhance the ‘Capability of the local subsidiary’ in Japan and allow them to become ‘centres of excellence’.

Many MNCs complain of entry barriers to the Japanese market. In 2007, 66% of MNCs in Japan stated that it was very difficult for them to recruit the talented people they needed. This was the most common complaint. Following this, 60% said that the cost of business in Japan was too high; 60% said that the Japanese clients’ demands for product quality were too stringent, and 50% said that the Japanese market was closed to non-Japanese people. The fifth complaint—that government regulation was tedious—was made by only 21% of MNCs in Japan. We can see how big these top four problems are for these MNC subsidiaries in Japan (JETRO, 2008).

When we take insights from our study and apply them to the problem of entry barriers to the Japanese market, we are able to arrive at a deeper understanding of how to set optimal conditions for these subsidiaries to become ‘centres of excellence’. We observe that MNC themselves may not be making enough efforts to make their subsidiaries in Japan ‘centres of excellence’.

Our study shows that a decent level of CAPEX for basic research and enhancement of R&D capabilities is essential. However, only 5% of all MNC subsidiaries in Japan have basic research capabilities, and only 18% of all MNC subsidiaries in Japan are planning to increase their R&D capability in Japan in the future. By contrast, 74% of MNC subsidiaries planned to increase their sales capability in Japan (JETRO, 2008). Clearly, MNC HQ are not making sufficient efforts to make their subsidiaries in Japan ‘centres of excellence’.
The key implication for MNC-subsidiary management in Japan is that the key elements to turn their MNC subsidiary into a ‘centre of excellence’ are mostly in their hands. Forming ‘links with specific external supplier’ can be easily done by MNC subsidiary initiatives and determination. In order to strengthen ‘CAPEX on basic research’, ‘Work expansion on R&D’, and ‘R&D integration to the rest of MNC’, MNC subsidiary management in Japan might need support from their HQ, but we would urge MNC-subsidiary management in Japan to become more proactive, rather than to be passive and trying not to change the current situation. As discussed above, we can see this kind of passive attitude in the trends that do not show any notable personnel from subsidiaries in Japan working in the MNC HQ. Should people working in MNC subsidiaries in Japan become more assertive regarding required resources from HQ, and when they focus more on what they can actually do within their subsidiaries in Japan, we are sure we will see more emerging ‘centres of excellence’ in Japan.

As we discovered in our study, the actual execution of tasks in MNC subsidiaries in Japan is mainly carried out by Japanese managers, as most of our respondents answered our questions in Japanese. We strongly believe that transforming and bringing these Japanese managers to a higher level—most notably, convincing MNC management to consider bringing them to their HQ in Europe or in the US—is fundamental for the formation of ‘centres of excellence’. Setting a clear career path for Japanese managers within MNC subsidiaries in Japan, even a chance to climb to a senior position in the HQ, would obviously enhance personal and professional motivations. We observe especially that many Japanese managers working for MNC subsidiaries in Japan do not have a high level of commitment to change by taking risks – this especially relates to the lack of opportunity to advance their position within the MNC itself. In such a situation, it is difficult for MNC HQ management to urge people to adopt a wider perspective and take more entrepreneurial and international-focussed leadership.

Another way the Japanese government can assist MNCs in Japan is by supporting their R&D as they do with domestic businesses. For example, NEDO, an agency under the Ministry of Economy, Trade and Industry strongly supports R&D activities in Japan and even, in some cases, awards financial assistance. Some of these grants are open to MNC subsidiaries in Japan. As the Ministry of Economy, Trade and Industry also governs JETRO, the agency promoting FDI in Japan, maximising the synergy of these two agencies are key to persuading MNCs to enhance R&D in Japan (METI home page, 2012). However, the Japanese government cannot take the initiative here; MNC subsidiary managers in Japan need to study these areas, share information with HQ, and take more
entrepreneurial action.

Our findings also address the complaint that Japanese clients are too demanding. We found that ‘centres of excellence’ had positive relationships with external suppliers, but negative relationships with external clients. This could be explained by noting that many MNC subsidiaries in Japan feel that Japanese customers are too demanding, and they don’t listen seriously to them anymore. This is probably due to the fact that Japanese companies tend to believe they are superior to their non-Japanese MNC suppliers, and that their suppliers need to listen to all their demands. Japanese clients need to listen more carefully to the voices of non-Japanese suppliers, since the latter may bring hints for them about how these Japanese companies could be more competitive in the global market. We may infer from our study that, on the contrary, Japanese suppliers to MNC subsidiaries in Japan are in fact listening carefully to their customers.

The same tendency can also be observed from the analysis of the impact of ‘Government institutions’ on the formation of ‘centres of excellence’. As discussed above, subsidiaries that experience stronger impact from government institutions are less likely to become ‘centres of excellence’. As noted earlier, 21% of MNC subsidiaries in Japan complained about Japanese government bureaucratic procedures. In the same way that Japanese clients need to listen more closely to foreign MNC subsidiaries in Japan, the Japanese government might listen more carefully to learn more about the way issues can be handled. As the Japanese government tends to make too many interfaces, we should introduce a one-step system with a single, visible Japanese governmental office that non-Japanese MNC subsidiaries could visit to carry out relevant governmental business.

The key contribution of this study is the analysis of foreign MNC subsidiaries’ activities in Japan and the identification of key factors that influence the formation of centres of excellence. Academic research on MNCs in Japan has not looked at this question--that is one reason our contribution is significant. As we could collect high-quality data to analyse MNC subsidiaries' activities in Japan, we believe the analysis itself is also a key contribution to MNC subsidiary literature. In addition, we were able to identify key strategic directions for foreign, manufacturing-sector MNC management to take in order to form centres of excellence in Japan. The basic strategy they need to impose is the basic MNC strategy already suggested by key researchers in this area, particularly in terms of HQ investment, scope expansion in relevant areas, and linkages to sources of competence. We think this is persuasive enough to send clear signals that success factors in the Japanese market are not that different from those in other developed countries. MNC
management needs to adjust only slightly for the Japanese market. This can be seen from the fact that developing specific products for the Japanese market did not have a substantial impact on the creation of ‘centres of excellence’ in Japan.

We have identified two key limitations of our study. First, since we based the frameworks for this research on academic frameworks developed mainly in North America and in Europe, we may have missed key insights in our study. For future research, to reinforce our findings, it might be necessary to reassess existing academic frameworks, especially in the selection of MNC typologies. Secondly, because of resource limitations, we focused only on foreign MNC subsidiary management in Japan. A promising direction for future research would be to assess the responses of MNC HQ management to the same questions we posed to foreign MNC subsidiary management in Japan. Indeed, although we assessed centres of excellence in terms of HQ recognition, this perspective was evaluated from the perspective of management of foreign MNC subsidiaries within Japan. We would like to compare these results with those from actual HQ perspectives, and to consider this impact on the formation of centres of excellence.

It would also be interesting to consider how to give practical remuneration to the management of MNC subsidiaries in Japan. Even if it is beneficial from an HQ management viewpoint to turn their subsidiaries in Japan into ‘centres of excellence’, when this is not in line with their managers’ motivation it is unlikely they will maximise their potentials. As we have discussed regarding the possible review of HR policy on the managers of MNC subsidiaries in Japan, this could also be a fruitful area for further investigation.
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## Appendix 1: Summary of the questionnaires questions

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<th>Measures</th>
<th>Notes</th>
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<td>Competence</td>
<td>a) Positive influence on other foreign affiliate firm(s) &amp; HQ&lt;br&gt;b) Recognition by other foreign affiliate firm(s)&lt;br&gt;c) Recognition by HQ&lt;br&gt;d) From the above perspective, the following measurement is ranked between 1-5. Above 4.5 is considered a Competence.</td>
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<td>Creating subsidiary</td>
<td>- Basic research&lt;br&gt;- Application engineering&lt;br&gt;- Product development&lt;br&gt;- Production of goods and services&lt;br&gt;- Marketing &amp; sales&lt;br&gt;- International strategy development&lt;br&gt;- Logistics/Distribution&lt;br&gt;- Procurement competence&lt;br&gt;- Human resources management&lt;br&gt;- Negotiating &amp; hiring top management in Japan&lt;br&gt;- Entering new markets in Japan&lt;br&gt;- Entering new markets outside of Japan&lt;br&gt;- Change of internal organization in Japan&lt;br&gt;- Specifying new suppliers in Japan&lt;br&gt;- Business planning in Japan&lt;br&gt;- Advertising in Japan&lt;br&gt;- Investment (CAPEx) in Japan&lt;br&gt;- Business specialization in Japan&lt;br&gt;- R&amp;D work&lt;br&gt;- Purchasing&lt;br&gt;- Manufacturing&lt;br&gt;- Sales&lt;br&gt;- After sales service&lt;br&gt;- Corporate HQ&lt;br&gt;- Specific corporate research unit&lt;br&gt;- Specific internal corporate customer&lt;br&gt;- Specific external corporate supplier&lt;br&gt;- Specific external customer&lt;br&gt;- Specific external supplier&lt;br&gt;- Specific distributor&lt;br&gt;- Specific research unit&lt;br&gt;- Governmental institution&lt;br&gt;- Technical information&lt;br&gt;- Supplier's information&lt;br&gt;- Market clients information&lt;br&gt;- Products' information&lt;br&gt;- Within Japanese subsidiary&lt;br&gt;- Within same global business unit&lt;br&gt;- Within Asia&lt;br&gt;- Global&lt;br&gt;- Develops products meeting specific Japanese market demands&lt;br&gt;- After sales service exclusively for Japanese market&lt;br&gt;- Purchasing process in Japan&lt;br&gt;- Manufacturing process in Japan&lt;br&gt;- HSO functions in Japan&lt;br&gt;- Marketing activities in Japan&lt;br&gt;- Basic research&lt;br&gt;- Application engineering&lt;br&gt;- Production of Goods and Services&lt;br&gt;- Logistics/Distribution&lt;br&gt;- Employee education&lt;br&gt;- Internal rivalry among business competitors&lt;br&gt;- Staggered demands from customers&lt;br&gt;- Staggered demands from suppliers&lt;br&gt;- Difficulty accessing competent suppliers&lt;br&gt;- Difficulty obtaining talented people (technical, bilingual, etc.)&lt;br&gt;- High cost of business&lt;br&gt;- Closed business network&lt;br&gt;- Severe governmental regulations&lt;br&gt;- Lack of international level business school for Japanese managers&lt;br&gt;- Lack of business school for non-Japanese managers to understand&lt;br&gt;- Business dealings in Japan&lt;br&gt;- Annual sales of your subsidiary in Japan (in 2020): Million JPY/year&lt;br&gt;- Regional sales generated by your subsidiary&lt;br&gt;- Japan %&lt;br&gt;- Asia except Japan %&lt;br&gt;- EU %&lt;br&gt;- IS %&lt;br&gt;- Rest of the world %&lt;br&gt;- Total number of employees of your subsidiary&lt;br&gt;- Number of employees from the country where your HQ is located&lt;br&gt;- Establishment method of your subsidiary (Please tick and/or check): Acquisition, Merger, or Other (please specify)</td>
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</table>
[Appendix 2: Summary of the literature comparison list for questionnaire]

[Chart: Comparison of academic literatures / Autonomy]

<table>
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<tr>
<th>Centre of excellence (Frost, Birkshinshaw, and Ensign, 2002)</th>
<th>MNE Competence creating subsidiary mandate (Cantwell and Mudambi, 2000)</th>
<th>Consequences of perception gaps in the headquarters-subsidiary relationship (Birkshinshaw, Hemin, Thilenius, and Arvidsson, 2000)</th>
<th>Subsidiary entrepreneurship, internal and external competitive forces, and subsidiary performance (Birkshinshaw, Hood, and Young, 2005)</th>
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<td>Autonomy for hiring top management, entering new markets within the country, entering foreign markets, changes to subsidiary organization, introduction of new products/services, approval of quarterly plans/schedules</td>
<td>For the above issues, specify where responsibility lies: 1. Subsidiary level? 2. Subcorporate level? 3. Foreign corporate HQ?</td>
<td>Extent to which decisions on suppliers are made, on hiring management staff, and on international marketing functions (7 point likert scale)</td>
<td>Percentage of top management from host country, export percentage, and years of exporting, and subsidiary's output mandate: a) Japan only, b) Asia c) worldwide</td>
<td>For 1) Market area served, 2) Product range supplied, 3) Advertising and promotion, 4) Research and Development, 5) Production capacity, and 6) Manufacturing technology,</td>
<td>Categorize the following on a 1-5 scale (Above 4 is cut-off) 1. Decided mainly by HQ without the consulting the affiliate 2. Decided mainly by the parent after consulting the affiliate 3. Decided mainly by the affiliate after consulting HQ 4. Decided mainly by the affiliate without consulting HQ.</td>
</tr>
<tr>
<td>Subsidiary can choose its suppliers without consulting global divisional management. 2. Subsidiary can change its organization without consulting global division management.</td>
<td>For these questions, register: 1. Totally disagree 2. Partially disagree 3. Neither agree nor disagree 4. Partially agree 5. Totally agree</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Chart: Comparison of academic literatures / Entrepreneurial culture

Entrepreneurial culture

<table>
<thead>
<tr>
<th>Subsidiary entrepreneurship, internal and external competitive forces, and subsidiary performance (Birklnshaw, Hood, and Young 2005)</th>
<th>Our study</th>
</tr>
</thead>
<tbody>
<tr>
<td>AV Value-added scope: indicate the number of different functional activities.</td>
<td></td>
</tr>
<tr>
<td>1. Manufacturing only</td>
<td></td>
</tr>
<tr>
<td>2. Entire valuechain (R&amp;D, purchasing, manufacturing, sales, and services)</td>
<td></td>
</tr>
<tr>
<td>B/Subsidiary upgrading: Value-added scope and/or market scope increased over last three years.</td>
<td></td>
</tr>
<tr>
<td>1. No change</td>
<td></td>
</tr>
<tr>
<td>2. Minor upgrading</td>
<td></td>
</tr>
<tr>
<td>3. Major upgrading</td>
<td></td>
</tr>
<tr>
<td>Categorise the following on a scale of 1-5 (above 4 is cut-off)</td>
<td></td>
</tr>
<tr>
<td>To what extent has the scope of the following been expanded by your subsidiary in Japan in the last 3 years?</td>
<td></td>
</tr>
<tr>
<td>1. R&amp;D work</td>
<td></td>
</tr>
<tr>
<td>2. Purchasing</td>
<td></td>
</tr>
<tr>
<td>3. Manufacturing</td>
<td></td>
</tr>
<tr>
<td>4. Sales</td>
<td></td>
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<tr>
<td>5. After-sales service</td>
<td></td>
</tr>
</tbody>
</table>

[Chart: Comparison of academic literatures / Links to internal & external competence]

<table>
<thead>
<tr>
<th>Centre of excellence (Guest, Birklnshaw, and Enslin, 2002)</th>
<th>Knowledge flow within Multinational corporations (Gupta and Govindarajan 2000)</th>
<th>Our study: &quot;MNC Links&quot;</th>
<th>Our study: &quot;Knowledge flow&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess the impacts of the following four organisational factors on the development of the subsidiary's competence.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Foreign corporate HQ</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2. Specific internal corporate customer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Specific internal corporate supplier</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4. Specific corporate R&amp;D unit.</td>
<td>Categorise the following on a scale of 1-5 (above 4 is cut-off)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>what extent have the following stakeholders invaded the development of core competence of your firm?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Corporate HQ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Specific corporate research unit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Specific internal Corporate customer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Specific internal corporate supplier</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Specific internal customer</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>6. Specific external supplier</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>7. Specific distributor</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>8. Specific competitor</td>
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<td></td>
<td></td>
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<tr>
<td>9. Specific internal research unit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Governmental institution</td>
<td>Does your subsidiary have knowledge-sharing capability such as cross-functional teams? (Please rate 1-4 (1=none, 4=very strong))</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. White Japanese subsidiary</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. White same global business unit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. White Asia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Global</td>
<td></td>
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</tr>
</tbody>
</table>

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### Chart: Comparison of academic literatures / Subsidiary embeddedness

<table>
<thead>
<tr>
<th>Subsidiary Embeddedness</th>
<th>In search of centres of excellence: Network embeddedness and subsidiary roles in multinational corporations (Andersen and Fombrun 2000)</th>
<th>Our study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Operationalise embeddedness as subsidiary technological embeddedness. With respect to each individual relationship, the subsidiary managers have been tasked to assess:</td>
<td></td>
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<tr>
<td></td>
<td>1. Extent to which the subsidiary's products, development or production processes are adapted to the requirements of the specific customer/supplier?</td>
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<tr>
<td></td>
<td>1 = not at all, 5 = very greatly</td>
<td></td>
</tr>
</tbody>
</table>

### Chart: Comparison of academic literatures / Level of integration

|----------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------|---------------------------|--------------------------|
|                      | 1. Global divisional management's and subsidiary's interests are usually identical when it concerns size and direction of subsidiary investments. 2. Global divisional management and subsidiary's interests are usually identical when it concerns purchasing. Subsidiary and the global divisional management fully agree about the subsidiary role in the relationship. Score each question 1 = Totally disagree, 2 = Partially disagree, 3 = Neither agree nor disagree, 4 = Partially agree, 5 = Totally agree | Access the following variables on a 1 point scale 1. Integration of purchasing with the rest of group 2. Integration of the manufacturing process 3. Proportion of local R&D out of total R&D 4. Integration of the R&D function with the group 5. Adaptation of products to the local market 6. Integration of marketing activities within the group | Integration: [Scored on a 5-point Likert scale] 1. Manufacturing decisions linked to local or worldwide market areas 2. Product specifications developed by subsidiary for its own or parent's markets 3. The extent to which the subsidiary earns MNC customers worldwide market areas 4. Sharing of technology development within the internal network 5. Dependence of subsidiary on linkage within the internal network 6. Centralisation of product planning | To what extent in your view are the following functions integrated in your group global system? Please circle: 1 Not at all integrated, 5 = Very greatly integrated | 1. Purchasing process in Japan 2. Manufacturing process in Japan 3. R&D functions in Japan 4. Marketing activities in Japan | Categorise the following on a scale from 1-5 scale (Cutoff is above 4) 1. Technical information 2. Final product information 3. Market sales information 4. Product information
### Chart: Comparison of academic literatures / HQ Investment

<table>
<thead>
<tr>
<th>Centres of excellence (Frost, Birkinshaw, and Ensign, 2002)</th>
<th>Our Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>HQ investment</td>
<td></td>
</tr>
<tr>
<td>Respondents were asked to assess HQ investment into the following:</td>
<td>To what extent has the level of investment by your HQ in the following activities by your subsidiary in Japan in the last 3 years increased? For each, please circle NA (Not Applicable) / 1 = Not increased at all. 5 = Very greatly increased</td>
</tr>
<tr>
<td>1. research</td>
<td>1. Basic research</td>
</tr>
<tr>
<td>2. development</td>
<td>2. Application engineering</td>
</tr>
<tr>
<td>3. manufacturing over last three years</td>
<td>3. Product development</td>
</tr>
<tr>
<td>4. Manufacturing over last three years</td>
<td>4. Production of Goods and Services</td>
</tr>
<tr>
<td>5. Logistics / Distribution</td>
<td>5. Logistics / Distribution</td>
</tr>
</tbody>
</table>

### Chart: Comparison of academic literatures / Japanese market impacts

<table>
<thead>
<tr>
<th>Centres of excellence (Frost, Birkinshaw, and Ensign, 2002)</th>
<th>Our Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japanese market impacts</td>
<td></td>
</tr>
<tr>
<td>Assess the level of competition in the following four areas:</td>
<td>In your view, to what extent do the following issues in the Japanese market impact your subsidiary? Please circle 1 = Not at all, 6 = Very greatly</td>
</tr>
<tr>
<td>1. Availability of supply materials</td>
<td>1. Intense rivalry among business competitors</td>
</tr>
<tr>
<td>2. Quality of suppliers</td>
<td>2. Stringent demands from customers</td>
</tr>
<tr>
<td>3. Demanding customers</td>
<td>3. Stringent demands from suppliers</td>
</tr>
<tr>
<td>4. Level of competition</td>
<td>4. Difficult accessing competent suppliers</td>
</tr>
<tr>
<td>1 = very low, 7 = very high</td>
<td>5. Difficult obtaining talented people (technical, bilingual, etc.)</td>
</tr>
<tr>
<td></td>
<td>6. High cost of business</td>
</tr>
<tr>
<td></td>
<td>7. Closed business</td>
</tr>
<tr>
<td></td>
<td>8. Customer regulations</td>
</tr>
<tr>
<td></td>
<td>9. Lack of international level business school for Japanese managers</td>
</tr>
<tr>
<td></td>
<td>10. Lack of business skills for non-Japanese managers to understand business dealings</td>
</tr>
<tr>
<td>Knowledge flows within multinational corporations. (Gupta and Govindarajan 2000)</td>
<td>Our study</td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td><strong>Cultural effects</strong></td>
<td>Proportion of local nationals in subsidiary top management. Subsidiary presidents were asked to indicate the nationality of each person: 1. Local national 2. Home country expatriate 3. Third country expatriate 4. Not applicable. Seven positions were surveyed in each subsidiary: 1. Subsidiary president 2. Head of marketing 3. Head of R&amp;D 4. Head of manufacturing 5. Head of finance 6. Controller 7. Head of HR</td>
</tr>
</tbody>
</table>