Influence of Subsidiary Network Pattern and Location on Multinational Enterprise Performance

Doctoral Program in Quantitative Finance and Management

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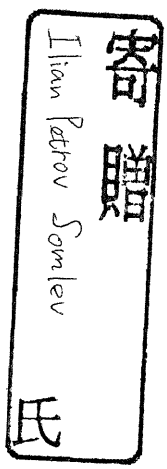

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Abstract

The paper develops two sets of concepts to describe the strategic choices of Japanese multinational enterprises (MNEs) with respect to firm expansion and the subsequent effect of these choices on performance. The first set of concepts reflects firm level factors of scope, intensity and location pattern of firm international network of subsidiaries. In chapter 1, these novel concepts are explored by multidimensional scaling, correspondence and principal component analyses and regression methods, and tested for theoretical relevance on a sample of 1052 Japanese firms with 11288 subsidiaries outside Japan. Network scope is defined as number of countries in which a MNE has subsidiaries. Network intensity refers to the level of involvement in each host country. Location pattern shows the individual geographical distribution of scope and intensity for each firm. The exploratory effort showed that scope is genuine strategic dimension, on which MNEs differ by choosing a scope between the minimum of two subsidiaries in two continents and over more than 30 countries in six continents. Intensity is strongly associated with investment in China. Location pattern analyses show that, although investors generally rank the host countries in terms of market size and production costs, only few countries – major Asian countries and US – are at the center of investors' strategies. Three hypothesis tests show that scope is strongly associated with firm resources and experience, location pattern depends on firm timing of initial expansion, and intensity is associated with high level of product adaptation to host markets.

The second set of concepts reflects factors of subsidiary location that are outside firm

sphere of influence. By using the bargaining power model, I test the hypothesis that location factors different from government regulations and country risks have strong predictive power for firm mode of establishment and ownership choice, in a sample of 751 manufacturing subsidiaries of 405 Japanese firms located in Europe. In the European context of few ownership restrictions I find that host competitiveness, host culture type, and industrial growth are the most appropriate location predictors for entry mode and for firm operation, in addition to industry and political factors.

Finally, I relate both sets of variables to firm profitability, by hypothesizing that scope improves performance while country risk and cultural distance affect it negatively. In addition to the broad set of both types of firm and location level factors, the profitability analysis benefits from inclusion of two independent measurements of the dependent variable. The results are consistent for these two dependent variables and generally support the two main hypotheses. The conclusion is that firms able to reduce the information asymmetry, inherent in international activity, by increasing their participation scope rather than involvement are most likely to be successful.

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Introduction

The present doctoral thesis is written in accordance with the requirements for the Doctoral Program in Quantitative Finance and Management at the Graduate School of Systems and Information Engineering, University of Tsukuba. The first section of this introduction presents the field of interest, motivation, objectives, and scientific contribution of my doctoral research. The second section presents the main arguments and general hypotheses of this study. The third section presents the approach, methodology and data used to analyze the problem of multinational enterprise expansion and profitability, and the fourth section outlines the structure of the paper.

Research objectives, motivation and contribution

My research is focused on multinational enterprise (MNE) expansion strategy and efficiency expressed in the location, pattern and profitability of MNE subsidiary networks. My research objectives are to analyze the MNE subsidiary network pattern, the subsidiary location effects on expansion, and the interactive location and strategic effects on profitability. The reason to choose subsidiary pattern as my research topic is twofold. The first has to do with the econometric methods I use in the present study. Since the start of firm international expansion in the 1960s numerous data were accumulated concerning MNE activity. These data sets are available today for professional analysis to reveal useful facts for the participating in the process firms. In an age of integrated world markets and communication technology that underpins

globalization, it is necessary to make use of the enormous quantity of firm data in order to help firms make their international operations more efficient.

The second motivation arises from the present historical moment. The early international business studies have focused first on MNE motivation, then on entry modes, culture effects, alliances and joint venture partnerships, always linked to performance. However, during these years of research effort, something was being developed or built by the MNE – their networks of subsidiaries. An important question naturally arises now, and it is relevant for the firms because the network-building process is still continuing, as to what properties of these networks will be useful for the founding MNE. Back in the beginning of 1990s researchers anticipated such network development and its importance for MNE competitiveness (Tanaka, 1991). Today, as MNE expansion has reached much broader scope and data availability permits rigorous analysis, it is demanding to set to the task to investigate the useful properties of subsidiary networks. The expanded, intertwined web of affiliates is in fact a new type of competitive advantage for the MNE.

As will be explained below, the network approach requires the researcher to take the perspective of the ultimate parent of a subsidiary. This holistic approach has the additional advantage of improving the MNE analysis by providing the complete view of the forest and not only of its separate trees. It also combines in a new way the contrasting headquarter and local levels and its findings may help firms overcome the conflicting challenges of operational integration and local adaptation.

The above two paragraphs define briefly the major contributions of my study; however a more detailed exposition is necessary, and provided below, to determine its place in the present scientific research on MNE.

MNEs start to exist when the exporting process is supplemented by creation of subsidiaries in foreign location, either production facilities, or after-sale service and trading firms[1]. The field of international business was established in order to explain the phenomenon of, in Hymer's terms, "the international operation of national firms" (Hymer 1960). It differentiated itself from the field of international economy very early in its development (Caves 1996, Chapter 2), although it retained the concept of comparative advantage with regards to what came to be known as "vertical foreign direct investments (FDI)". Instead of working with aggregates, the scholars in the field approached the phenomenon from a microeconomic point of view, by focusing on the activities of the main actors: the multinational enterprises. This firm-centered approach remains prevalent to the present date (Krugman and Obstfeld, 2000).

The pioneering studies started, naturally, by addressing the problem of the motivation to invest abroad, and the findings suggested that internal incentives to expand exist in every firm (Penrose, 1972), but their magnitudes differ according to industries, with less traditional, or more R&D intensive ones at the helm (Caves, 1996)[2]. Scholars agreed that proprietary assets and transaction specificity coupled with imperfections in the markets for technology and intermediate goods are basic reason for MNE existence (Caves, 1996; Williamson, 1985). Once the theoretical explanation of MNE activities became widely accepted and the FDI widely practiced, other issues (besides FDI

[1] Some authors accept a stricter definition of MNE as a firm that has established production subsidiaries abroad (Caves, 1996). Firms with only sales subsidiaries are still not MNE according to this definition; although by doing so they come closer to their clients than by exporting only. In my research I adopt a weaker definition of MNE and treat firms only with sales subsidiaries as MNEs.

[2] Some researches turned back to the beginning of the twentieth century to demonstrate that the phenomenon existed in the past mainly due to some kind of forced trade or production associated with colonization, empires, wars and exploitation of other nation's natural resources. In the post-war period of freer trade and self-determination the internal inducements in firms explain better firm expansion, although not exactly its *international* expansion.

motives) focused the efforts of international business scholars. These issues include human resource problems, management and organizational complexities, effects of experience and learning related to the foreign operations, effects of FDI on home and host countries (hollowing-out and squeezing-out), and the question of profitability of foreign operations. The human resource aspect and home and host country effects of the MNE activity are subjects that partly belong to other disciplines like organizational behavior and economic development. Observations of these phenomena are quite difficult to quantify. On the other hand organization, learning effects, profitability and growth (or stability versus divestment) of MNE activities represent the core of present analytical efforts in the field. Experience, entry modes, profitability and increase (or decrease) in investment are all quantifiable observations.

Unfortunately, researchers often study the latter variables on a local level, i.e. by accepting that MNE subsidiaries, even those of a same MNE, are independent units of analysis. Certainly, this shift of focus from the MNE to the subsidiary or more generally to the FDI transaction (it may be not only a wholly owned subsidiary but a share in a joint venture) is analogous to losing sight of the forest for the trees. In given contexts this is justified on the grounds that specific circumstances play more important role in the fate of the subsidiaries than the fact that they have a common parent. Such circumstances are local in nature and the necessity of the parent to adapt to different host realities makes its subsidiaries less similar and more independent. However it is the parent that decides where to enact FDI transactions and its strategy is more important for the subsidiary than local driving forces. Therefore, it is not easy to assume that subsidiaries of a same parent, especially in a same region, or continent, are independent from each other. This realization has most direct consequences for the analysis of

profitability, and influential scholars in the international business field have maintained that the MNE enterprise may sacrifice a subsidiary performance temporarily if this will enhance overall profitability from overseas operations in the world or in a region (Dunning, 1993; Rugman, 1979).

It is clear that the development of MNE studies has gone a long way since the early studies on the subject and having returned back to the forest, i.e. the subsidiary network, many challenging questions arise. If we define a regional network as all FDI transactions, either direct or through another subsidiary, of a MNE (or ultimate parent) in a given region, then some of these issues are: reasons for extensiveness of the network in terms of number and location of subsidiaries; constitution of the network in terms of industry type (production, trading, financial, headquarters) of the subsidiaries, or in terms of entry mode type; network structure in terms of intermediate firm number between subsidiaries and parent (clustered or prolonged networks); and profitability of the overall network. In this respect, my research focus is on MNE expansion strategy and efficiency expressed in the network location, pattern and profitability of MNE subsidiaries.

There is embedded in the strategy of expansion the most intriguing issue of interaction between headquarter and local levels. The contrast between these two levels exists because of the different spheres of autonomy: one of the MNE expressed in its strategic decisions, and another of host government, culture and tradition expressed in the restrictions and constraints they impose on MNEs. In the words of a prominent scholar and practitioner, "the development of a global economy has not been matched by the development of a global society; the basic unit for political and social life remains the nation-state" (Soros, 1998). For example, the incorporation of entry mode

into the analysis of MNE networks may not be straightforward or logical, because in many entry mode choices local circumstances may pre-empt MNE-level considerations[3]. My research objective is to analyze, in addition to MNE network patterns, the location effect on expansion, and the interacting location and strategic effects on profitability.

The originality of the study consists in adopting ultimate parent perspective when analyzing the FDI process[4]. Studies that focus on FDI transactions usually ignore the question of who is the ultimate parent of a foreign subsidiary. This leads to two different types of error, both of which are corrected within the characteristic approach of my research. The first type is the error of treating dependent units of observation (i.e. all firms in a regional network of a MNE) as independent. The second error is to take the first foreign shareholder of a FDI entity as the foreign parent without investigating further the possibility this parent to be a daughter company of another, ultimate MNE. Alternatively, a wholly owned local firm may belong to a joint venture in which case it itself should be considered (in term of its ultimate parents) as a joint venture. Failure to recognize who is the ultimate parent underestimates in both cases the scope of ownership advantages and makes the findings dubious. In my study therefore, following Beamish et al. (1997), a differentiation is made between ultimate and immediate parent of a subsidiary.

It should be stressed that the magnitude of the first type of error depends on the extensiveness of the network. If the MNEs have only one subsidiary in a region, then it

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[3] Entry mode stands for the choice between joint venture, acquisition, or wholly owned firms, and not for the choice of licensing (precluded by internalization theories) or for exporting, because these are not "entry". Exporting still remains relevant because this quasi-international activity (in the present context) may influence the network pattern of the observable true international activity.

[4] Of course, there are studies of some aspects of the FDI process, e.g. bunching behavior of MNE, that adopt explicitly such a point of view (Makino and Delios, 2000). Such studies are often time-related and not focused exactly on network patterns. Application of ultimate parent perspective to FDI networks within a cross-sectional design is therefore a novel approach.

clearly makes no difference if the focus is on the FDI transaction or the parent. In this case, which includes roughly a third of the sampled FDI transactions in the analyses below, the independence assumption will do. However, for the bulk of the FDI transaction, improving the first type of error makes a real contribution.

The application of the ultimate parent perspective to analysis of FDI networks combines an effort to correct the above-mentioned mistakes with a holistic focus on the MNE activity. It is the whole of the network that reveals MNE scale and scope of activity and which therefore represents the most readily quantifiable observation or measurement of such activity. Subsidiary network analysis is therefore the second novel perspective that the research incorporates.

The position of the research among other studies in the field is evident from the above discussion. It is a part of the field studying organizational structures of MNE activity, as well as of the debate over the factors that determine the profitability of FDI operations. Because of the adopted ultimate parent viewpoint my research is closer to the studies of firm strategy (Porter, 1985), but is nevertheless firmly grounded in MNE theory and research as well. It is not so much interdisciplinary but rather tries to correct important mistakes and apply the network concept to the field of firm analysis.

Discussion of main hypotheses

Given the stated objectives the results of the research are expected to elucidate the relationship between network features and profitability, and between factors of ownership or location and network features. The significance of this analysis will be to reveal the most successful organization of MNE activity to the extent this can be done

in an inter-firm, quantitative, observational study.

The main arguments correspond to two main questions that underpin the present study: the question of internalization and the question of autonomy. The former refers to the choice "make or buy", i.e. the choice of market or hierarchical organization of economic activity by the MNE. The latter refers to the question of political, economic, and social autonomy of host locations. This should not be confused with the autonomy of the subsidiary to make routine or strategic independent decisions, which belongs to the former question and represents a way to govern a hierarchical relationship. The second question refers to MNE-host interaction and is usually described in bargaining power terms (Moon and Lado, 2000). It should be noted that the question of location is not altogether missing in the study but is rather implicit in the question of autonomy, because both factors stem from the same local endowments.

My argument is that the broader the scope of activity of a MNE the better its performance will be, because of the higher degree of control it has compared to rivals that are more dependent on market forces. With respect to local adaptation I expect that the above control advantage will be less pronounced in contexts where hosts have high bargaining power. Both claims are refutable. Many scholars have discussed the general disadvantages and costs associated with monitoring and control in hierarchical organizations, as well as the specific costs with respect to FDI transactions (Parey, 1985). Successful entry into hosts with high bargaining power, on the other hand, may bring advantages to MNEs from operating behind entry barriers, constituted by the same high bargaining power of the host.

Stemming from the above two main arguments, I set several specific hypotheses concerning location effect on expansion (chapter 2), and network pattern and location

effect on performance (chapter 3). It is more likely that networks that are less developed and hosts that have high bargaining power both impose on MNEs a less than optimal organizational pattern and thereby affect negatively MNE performance. Before empirical investigation of these hypotheses, however, a set of concepts has to be developed to explain MNE network patterns. I claim that scope, intensity and location pattern of a network form the most meaningful set of descriptive concepts and I find empirical support for the relevance of these concepts in chapter 1. Network scope refers to the number of countries a MNE has invested, intensity refers to the extent of involvement across countries, and location pattern indicates the distribution pattern of all subsidiaries of a MNE in the world. The definitions of these three concepts are elaborated in chapter 1.

Approach, methodology and data

The many aspects of the FDI process include investment decision, financial decision, location assessment, supplier relations, personnel selection and others, and could be approached from the respective subjects of international business, corporate finance, consumer behavior, international political relations, operations research, international human resource management, etc. The present study approaches the investment and location aspect from the general strategic perspective of the international business field.

There are two broad dimensions to this study - space and time. With respect to the spatial dimension the research focuses on groups of specific regions, e.g. "ASEAN" or "Asia", according to the different strategic use MNEs have of the countries in these regions, as well as the specific political and economic circumstances of each country in

them. The other - time - dimension is more intricate. Although a time-series study of the development of networks may reveal the dynamics of investment (and divestment) process, at present the aim is do to a cross-sectional analysis in order to compare different network patterns with respective MNE features and profitability. A cross-sectional study is but a snapshot of a dynamic reality and many factors that have affected with time the subsidiary network remain hidden in such kind of study. The worst thing that could happen is time-related factors to affect in a different way the separate units of analysis and the cross-sectional differences to be reflection of this, rather of some cross-sectional factors. However, if time-related factors affect all units in a similar way, the conclusions of a cross-sectional study will be valid. Often the important time-related factors connected with MNE activities – like exchange rate movements – affect *all* MNEs that come from the same home country due to the macroeconomic nature of these factors. For this reason I analyze MNEs from a single home country, Japan.

In addition to nationality, it is necessary to choose the type of activity of MNEs for analysis. Focus on banking, services and manufacturing MNEs altogether will unnecessarily complicate the exploratory task and the empirical models, therefore I focus only on manufacturing MNEs in order to make the best use of the available data, which consists mostly of manufacturing firms. It is only empirical considerations that set limits on MNE industry type; the general claims should hold for MNEs in other sectors as well and separate empirical studies may be carried out to support them.

The methodology for this quantitative in nature study is to build hypotheses based on the relevant MNE theory and to test these hypotheses by statistical or econometric methods. The paper employs, therefore, econometric methods, specifically logistic and

multiple regression, cluster analysis, multidimensional scaling, correspondence and principal component analyses. It is not employing case-studies, although it includes relevant case-study type information from secondary sources (for example Strange, 1993).

The research uses data collected by Toyo Keizai Inc. (2003) on Japanese FDI in the world, complemented with data from two online American databases (Mergent, and Lexis-Nexis), as well as with data from the official web-pages of the MNEs included in the analysis. Both of the latter secondary sources were used mainly for correction of measurement errors and for checks of consistency. Specifically, few errors in date and mode of establishment, equity, and ownership errors were corrected, as well as errors-outliers, in order to reduce distortion in the statistical results.

The Toyo Keizai database has also the deficiency, in view of the above discussion of ultimate parents, to stop at the moment the residence of a parent firm becomes Japanese in order to select that firm as ultimate parent[5]. The necessary corrections were made in order to bring the database in the appropriate form necessary for analysis from the point of view of ultimate parents. From the total of 2876 manufacturing parents in the database, 266 (about 9%) were replaced with their ultimate parents, resulting in a sample of 2610 manufacturing parents having a total of 13433 subsidiaries outside Japan in manufacturing, commercial, banking and other industries. The samples used in chapters 1, 2 and 3 are subsamples from this general sample.

[5] In this way, for example, Pentax Sales Company and Asahi Optical co-own Pentax GmbH in Germany, and both are considered as the ultimate parents of a related-Japanese parent joint venture. However, Pentax Sales is a small company, owned 100% by Asahi Optical, which is in fact the only parent. The correction requires deleting Pentax Sales from the list of the ultimate parents and regarding the subsidiary Pentax GmbH as wholly owned by Asahi Optical.

Organization of the paper

The analysis of network pattern is presented in chapter 1. This chapter defines the basic network concepts of scope, intensity and location pattern, finds empirical support for the existence of these features in the general data set, and establishes connections between them. It is an exploratory effort to reduce the network pattern of firms to basic components that carry most of the information concerning the network, with the aim of using these components as structural variables in the analysis of performance. While the focus of chapter 1 is entirely on headquarter, or strategic, level, chapter 2 incorporates the opposite, the local level, and in this way completes the network pattern analysis. It studies the effect of location advantages on MNE strategies and reveals how independent host factors intervene in the MNE investment process. This analysis is an effort to connect the opposing host and local levels in a way that will suggest location variables for inclusion in the analysis of performance. Chapter 3 then carries out analysis of the simultaneous effect of both sets of pattern and location variables on performance. It employs two different measurements of performance, one on local, and one on headquarter level and tests the two main hypotheses discussed above. Finally, the conclusion summarizes the major findings as well as the limitations of the study, and gives suggestions for further research.

Chapter 1: Network Patterns

1.1. Introduction

The purpose of this chapter is to explore empirically the features of multinational enterprise (MNE) subsidiary network, established in the world by Japanese manufacturing MNEs since the start of their international activity until the beginning of 2002. As explained above, the selection of *manufacturing* MNEs has only comparative purpose and this limitation does not apply to their subsidiaries. It is necessary to choose MNEs from a single home country in order to control for the effect of time-related factors in the present cross-sectional study. Due to their macroeconomic nature, these factors are likely to influence firms from same nationality equally. It should be noted that new subsidiaries are established or old ones divested each year, which make networks evolve; therefore, the analysis below is only a static picture of a dynamic phenomenon. There are three other important issues, beside industry, nationality and time, which have to be defined before exploring network nature, namely what is an international activity, what is an MNE, and what is a meaningful spatial representation of the world in terms of investment.

MNE is usually defined as a national firm having some kind of international operation (Hymer, 1960). The literature on MNE generally does not consider the presence of exporting or licensing sufficient to define MNEs, but accepts some type of foreign direct investment (FDI) or capital transfer as a basic MNE feature. With respect to manufacturing MNEs, some authors maintain that their FDI has to be in

manufacturing, i.e. MNE is any firm with a factory in a foreign country (Caves, 1996). However, inclusion of subsidiaries in after-sale services and commercial industries is necessary when focusing on MNE networks as a whole, because manufacturing and sales networks complement each other. I employ the latter approach in my study and consider any type of FDI transaction as part of the international activity of MNEs[6]. The reason for this choice is my general claim that MNEs start to exist whenever a firm extends its control over production and distribution of the good it produces. Thus investment in a commercial subsidiary represents extension of control to downstream operations, while investment in a manufacturing subsidiary extends control to factors of production. Nevertheless, I carry out also independent analyses of manufacturing networks only, because these subsidiaries are usually studied alone (Padmanabhan and Cho, 1996; Belderbos et al., 2001; Delios and Henisz, 2000; Hennart, 1991).

The claim that MNEs expand internationally as a means of controlling their environment is a logical continuation of the basic theory explaining MNE activity (Caves, 1996; Williamson, 1985; Rugman, 1979; Penrose, 1972). The basic premise of the transaction cost theory is that by substituting markets with hierarchies firms are gaining control that prevents the loss of competitive advantage (Andersen, 1997). Therefore, it is useful to define a MNE as a firm that extends its control over foreign production resources or foreign customer servicing in order to protect and increase its competitive advantage. This definition is useful for dividing the MNEs into two meaningfully different groups: MNEs that are involved in international activity only to

[6] "FDI transaction" is more encompassing than "subsidiary", because the latter supposes majority participation, while the former includes any equity investment bigger than 10%. I use throughout my analysis the word "subsidiary" in the broader sense of FDI transaction. Parents that own more than half, or majority, of shares (a "subsidiary" in the usual sense of the word), or the greatest part of shares in a firm, are called main parents. Secondary parents are those that carry out a FDI transaction of less than 50% of subsidiary capital, or less than the main parent share.

protect and MNEs involved in order to *increase* their competitive advantage.

There is good justification for the existence of this difference. With respect to Japanese firms, some authors have identified three groups of MNEs: focused exporters, efficient importers, and genuine MNEs (Tanaka, 1991). The first group consists of firms that set a subsidiary only in one host country to which they have been previously exporting, often to overcome a trade barrier. The second group includes firms that invest in cost-efficient locations only to import the production in their home country. These firms extend the domestic competition by including international factors of production in their production process, but do not compete on a really global, or at least on a supra-national level. The important feature of both groups of firms is that they do not create in reality a network, and their investment stands alone and isolated. Their investment is like a reaction to external pressures and an attempt to protect their market, foreign or domestic, and therefore expansion is not an issue for them. The existence of these groups was supported empirically in the present sample as well. This distinction is of great importance for the present study, because it concerns the comparability of its objects of analysis. Putting together firms that have no intention of expanding beyond a narrow limit with genuine MNEs makes little sense analytically. The separate issue of explaining the factors that account for crossing the border between quasi-MNE and genuine MNE type is a discussion requiring another study. At present, I delete all manufacturing firms that have investment - in any type of industry - in only one continent (80% of them invest in only one country and 99% of the remaining invest only in Asia supposedly as efficiency-seeking importers) and focus on the remaining "genuine" MNEs whose networks can be meaningfully compared. This deletion is compatible with other criteria for MNE selection (Stopford, 1982) and reduces the

sample from 2610 manufacturing parents (13433 subsidiaries) to 1052 parents (with 11288 subsidiaries).

Finally, it is necessary to group the more than 100 countries in the world in meaningful sets to simplify the empirical analysis without loss of information. One possible way of spatial grouping is by FDI concentration. For example, while the sampled MNEs have invested in 106 different countries, there are only 24 countries with about 50 or more different investors and subsidiaries, and this high FDI concentration is related to their size and other location attributes. The remaining 82 countries may be treated as satellites of these 24 countries or as marginal sites for FDI (Tables 1.1 and 1.2). Although this method seems to be sample-dependent and hence theoretically unreliable, in reality MNE investments are done in accordance with location advantage distribution, as location theory would suggest. Another method is to group countries by their belongingness in clearly distinguishable, regional blocks, such as the EU, NAFTA, and ASEAN countries (Table 1.3). The next section discusses in detail the properties of a meaningful spatial representation of FDI.

1.2. Theoretical explanations of foreign expansion

The purpose of this section is to discuss the relevant theory and previous research concerning firm internationalization and to find guidelines therein for empirical exploration of MNE networks. The literature on international business generally refers to the period from 1960 onwards. Firm expansion was facilitated after 1960 by trade liberalization policies and openness of foreign markets, and this *quasi*-international expansion only through exports, not FDI, gave birth to the concept of international

competition. Competing in the expanded markets requires cutting the costs, increasing the proximity and interactions with the final clients, and allying with other firms for mutual advantage. One solution is establishment of a production subsidiary in a labor-abundant country, while another is investing in countries with sizeable and rich markets[7]. Scholars accept generally four motives of international expansion and respective types of FDI, which are solutions to the respective challenges of international competition. These are resource (besides labor) seeking FDI, vertical disintegration of production (usually, but not only, a labor-intensive stage is carried out abroad) or vertical FDI, horizontal or market-seeking FDI, and penetration of oligopolistic market mainly via acquisitions or asset-seeking FDI (Dunning 1993). This approach to explaining *international* expansion is closely connected with international trade theory and focuses on one side of the theory of MNE: the **question of location** (Krugman and Obstfeld, 2000, Chapter 7).

More theoretically minded scholars argue that location theory does not explain the existence of MNEs. It points out the forces that motivate cross-border transactions, but these transactions need not, theoretically, be carried out within a firm. Firms with growing assets (internal inducements) in the respective innovative industries could lease their technology to firms in big or protected markets, instead of expanding their own production. Firms that need cost reductions because of strong competition in domestic or export markets, or firms that need raw materials could use the services of domestic

[7] The latter process is magnified when the countries with high-potential market impose restriction on the trade process. According to the many surveys of MNE motivations to invest (e.g. Blanpain and Hanami, 1993), the firms choose to invest in such countries even given a free-trade regime, therefore the trade restrictions only escalate the process, or become a preemptive factor in choosing a location in the case when both comparative advantage (i.e. resource abundance) and economies of scales (market size) play a role (Mortimore, 2000). Other trading "costs" like transportation or unfavorable exchange rate changes magnify both processes.

firms in the respective resource-abundant locations. In this way the theoretical argument centers on markets and hierarchies as alternative forms of organization of (international) economic activities. This economic approach focuses directly on MNE raison d'être, or on **the question of internalization**. This question was analyzed earlier and in a more general perspective than that of the international business field (e.g. Coase, 1937). Market failure and bounded rationality, as forces prevalent in international context, are the economic reasons for the rise of hierarchically organized MNE activities. When there is failure on the market for intermediate products, resource-seeking and vertical FDI will occur. This is the vertical integration hypothesis of the internalization process, which adopts the Coase's approach and gives substance to it by explicitly developing the concepts of asset specificity, frequency of transactions and uncertainty (Williamson 1985). When there is a failure on the market for technology, market seeking and (instrumentally to the market penetration purpose) asset-seeking FDI will occur. This is the intangible (proprietary) asset hypothesis of internalization (Caves, 1996).

Market failures arise generally from information asymmetry and are therefore independent from investor or host nationality. This is especially relevant for technology market failure. Firms that possess superior intangible assets will naturally grow as MNEs investing first in close countries with large markets, because market size and proximity bring higher returns and incur fewer costs (Head, 2005). Nevertheless, host institutional environments are likely to influence further the extent of MNE involvement with a country. Examples of relevant elements of host environment are the intellectual property right enforcement, existence of ownership restrictions, labor costs, and local competitor strength. When MNEs want to substitute intermediate goods market with a hierarchical organization, the same host conditions are relevant; however, this time the

underlying country variables are its endowments as pointed by location theory. Supposedly, when markets are substituted by own subsidiaries, production costs will decrease, facilitating further market-seeking expansion, i.e. inclusion of new and more distant markets in MNE investment networks.

To summarize, MNE expansion, or creation of subsidiaries abroad, will be dependent on firm own competitive strength, on host country size and distance from the investing firm, on host wage level, political and cultural environment, strength of local competitors, natural endowments and other sources of comparative advantage. Expansion will be dependent on a final cost-benefit calculation of these relevant issues by the MNE, including agglomeration, scale and diversification effects. For example, participation of countries in regional trading blocks may offer advantages of scale and market access. The investment process may be rather complicated and idiosyncratic, and it is necessary to start from its most observable parts like the firm and country attributes listed above. It is certain that firm competitive strength will be reflected in the extension, or scope of its subsidiary network, because firm proprietary assets determine its likely extent of foreign involvement and growth in general (Penrose, 1972). Therefore, network scope is the first property likely to differentiate MNE networks.

The second network property that is likely to differentiate MNE networks according to MNE strategy is the network location pattern, formed by the distribution of countries MNEs invest in. In order to present clearly this location pattern the model has to include as many countries as possible, like the groups presented in Table 1.2, which are almost identical to the main countries underlying each group. These 28 groups encompass the entire space in which Japanese MNEs operate and their values for the above listed host attributes can be observed and compared. In fact, when compared for all these attributes,

it is clear that further aggregation is possible as presented in Table 1.3. The 14 groups in Table 1.3 possess internal consistency for most of the important attributes and are still diverse enough to allow location patterns to vary in all conceivable ways according to MNE strategies. Country wage level differences, physical and cultural distances, regional integration effects, center-periphery or agglomeration effects, and political separation effect are all preserved with respect to these 14 groups. These are the most important forms of separation for MNEs (Head, 2005). Whenever regional integration gives access to the market of the region members, market size effect is also preserved. The weaker regional integration of South American countries was the reason not to combine Brazil with its neighbors. The wage and culture differences between Mexico and the two other NAFTA countries was the reason to list them separate, as was the case with the EU countries. More detailed exposition of the location features of the latter, which justifies their clustering in the four groups of Table 1.3, is provided in chapter 2. Finally, due to small sample size it was necessary to create three broad groups of countries in Asia, Central/South America, and Africa/Oceania.

The groups in Table 1.3 are used to analyze MNE network location pattern in the following two sections. This grouping omits the internal for each country differences and this is the general limitation of the present study. Many country differences were lost, of course, in the transition from Table 1.2 groups to those in Table 1.3; therefore, the next two sections present also a replication of the analysis by using Table 1.2 groups in order to confirm that the factors accounting for MNE network location pattern are stable across the two groupings.

The last MNE network property, after scope and location pattern, which is expected to reflect different MNE strategies, is network intensity. MNEs with similar network

scope and location pattern may have different level of involvement with their host countries. Some firms increase their competitive advantage by adding new countries to their network scope, while others find benefit in investing further in countries in which they had already set up subsidiaries, which does not increase network scope. It is arguable that the former firms are interested first in expanding their market position, or in increasing competitive ability to offer a good/service that is global in nature, and only then in increasing country intensity. On the other hand, the latter firms are interested more in exploiting fully a host country potential, or find that the most efficient operation in a host is through further involvement with local suppliers and further investment in local factors of production. If most MNEs were from the first type there would be a perfect correlation between scope and intensity, which is not supported empirically in the present sample. Some amount of positive correlation exists however, which shows that the sampled Japanese MNEs are not entirely from the second type either, and are therefore mixture of both types.

Theoretical discussion of these two different types of MNE strategies has been developed in studies on global as opposed to multidomestic MNE strategic types (Harzing, 2002). The former refers to firm context with high level of global competition in standardized products for which economies of scope, scale, integration and rationalization is of utmost importance for efficiency. The latter refers to context with a lower level of global competition where firms compete mainly on a domestic level and adaptation of products and policies to local markets leads to efficiency (Harzing, 2002). The latter strategy is more likely to lead to local involvement and intensity, defined by number of MNE subsidiaries or by scale of operations in each host location. Therefore, we may expect that each type of good MNEs provide is linked to different strategies of

expansion with respect to intensity and scope, and that intensity and scope are inversely related because creation of a network with both high scope and high intensity taxes heavily firm resources.

The above theoretical discussion of MNE international expansion suggests the existence of different aspects of the expansion process, like host involvement (intensity) and geographical spread (scope). Previous research in firm internationalization has also focused on different aspects of the process, most notably on the degree and pattern of international diversification (Geringer et al., 2000; Tallman and Li, 1996; Rugman and Verbeke, 2003; Emmott, 1993) and its influence on firm performance. While investigation of the latter effect is carried out in Chapter 3 of this paper, the remaining part of the present section will show how previous research is related to the concepts of scope, intensity and location pattern.

The research on firm degree of multinationality or international diversity is relatively new in international business literature. It is often an extension of the research on product diversification and is based on the resource-based and transaction cost theories discussed above (Geringer et al., 2000; Tallman and Li, 1996). Although its theoretical foundations are well-established, the definitions and operationalizations of the concept of MNE international presence are diverse. Most authors focus on the overall importance of foreign operations for MNE activity. They measure the share of firm international activity by dividing total sales of foreign subsidiaries to total sales for the firm (Geringer et al., 2000). This variable is quite general in nature because it reflects neither the number of countries in which MNEs operate, nor the location strategy of these MNEs. These are significant omissions because number of invested countries is important source of competitive advantage for MNEs pursuing global strategy, and

because degree of host involvement, which is important measure for MNE multidomestic strategy, depends on the number of countries over which this foreign-to-total sale ratio is distributed. Host country count is used by some authors (Tallman and Li, 1996); however, this variable alone does not reflect the importance, or standing, of each host country in MNE international activity. It is clear that some combination of involvement (ratio of activity abroad to total activity) and geographical spread (country count) has to be used for appropriate reflection of MNE foreign operations. One possibility is to differentiate general spread from the number of countries in which there is significant involvement and then to measure the level of that involvement based on this reduced set of investment destinations. This distinction corresponds to the MNE network features of scope and intensity, whose theoretical relevance was presented above and whose definition and operationalizations are elaborated further in the following sections.

There are further some authors, who use the ratio of sales in foreign *regions* to total firm sales to develop models of MNE investment distribution (Rugman and Verbeke, 2003; Emmott, 1993). These authors claim that few MNEs are truly global, because most of them operate intensively only in one pole of the Triad (the economic zones centered on and around US, Europe, and Japan), and especially the pole to which the country of origin of these MNEs belongs. Thus these authors simultaneously introduce the concept of regional distribution of MNE investment and claim that there are marginal locations/countries in the total country count, because of relatively low (or inexistent) sales in these locations. The concept of investment distributions corresponds to the remaining network feature discussed above – subsidiary location pattern. However, while Rugman and Verbeke (2003) constrain the spatial representation of

MNE investment to 6 regions (three Triad regions each divided to center-periphery), the present paper will analyze the location pattern based on almost all possible location pattern configurations.

It is clear from the above discussion of previous research in the field of international diversification that each study had severe limitations that arise from adoption of one-sided perspective on the internationalization process. There are three main aspects, or perspectives of this process, analyzed in the literature: overall foreign involvement, overall geographical spread, and only the most general pattern of investment distribution oriented mainly to locations of higher involvement. The present paper contributes to this field of study both by combining these separate aspects in one holistic approach to MNE subsidiary network patterns, and by analyzing in greater detail and depth each of these general characteristics. I use the concepts of intensity, scope, and location pattern when referring to the separate aspects of involvement, spread, and distribution of MNE investments. I argue that without integrating all sides of the MNE investment process there will be little progress in the understanding of its development and its influence on performance. For example, while some authors may work with samples in which overall foreign involvement (foreign-to-total sale ratio) accumulates due to high country scope and find it significantly and positively related to performance, other authors will be surprised to find the same variable significant but negatively related to performance, when intensity is the underlying source of foreign involvement. By distinguishing between the two concepts of scope and intensity and controlling for location pattern the present paper is able to explain the contradiction, which actually exists (Geringer et al., 2000) in the literature (in Chapter 3 I find that while scope is positively related to performance, intensity has negative relationship with

it).

The theory and previous research presented above suggest that scope, location pattern and intensity are important network properties that should be revealed in the data. It also gives guidelines for the variables that underlie these properties. I analyze the data in the next two sections, first based on counts or binary data that reflect subsidiary existence (section 1.3), and second based on the amount of subsidiary equity relative to MNE total assets that reflects subsidiary scale (section 1.4). Then, in section 1.5 I relate the empirical results to the suggested by theory underlying variables.

1.3. Empirical exploration of subsidiary networks based on counts

The purpose of this chapter is to explore the features of MNE subsidiary networks. Before setting to the empirical part of this task it is necessary to discuss the properties of the different subsidiary types in terms of their field of activity. Generally, subsidiaries may produce, sell, or provide financial assistance for the purchase of their products in the host country. Data of subsidiary types are given in Tables 1.1, 1.2, and 1.3. In essence, subsidiaries in resource-extraction are few, and most of the "others" provide financial or maintenance services connected to sales, so they are similar to subsidiaries with sales activity. More problematic is the fact that manufacturing subsidiaries may be involved in production of intermediate goods only, assembly only, or both activities with different level of local procurement. While the gradation of local involvement is clear, it is less clear how to measure it. How more involved in a country are firms that assemble locally from firms that also produce locally some parts in-house? A conservative approach is to accept that the major "jump" in local involvement is the

decision to invest in manufacturing, and not only in some kind of sales activity. Therefore, I investigate network properties by differentiating manufacturing and non-manufacturing subsidiaries. Even here it is impossible to measure the amount of difference, and yet it is necessary to reflect somehow the fact that a network of sales subsidiaries in several countries is intrinsically different from a network of same number of *manufacturing* subsidiaries in the same countries. One solution is to investigate both networks separately but this will split in a random and unpredictable way the integrated and mutually dependent MNE sales and manufacturing strategies.

1.3.1. Data representation

I choose to put next to each other the manufacturing and sales (including other) country distributions with a binary sign for the presence/absence of each respective type of subsidiary, and then compare MNEs for overlap. It is important to note that every manufacturing subsidiary is responsible for sales to the host market as well, and therefore combines both types of activities[8]. Therefore, the binary representation of distribution differences between MNEs makes sense in that subsidiary networks are compared on an essentially ordinal measurement scale. Table 1.4 illustrates this method.

Distances between MNE columns were computed and then analyzed by ordinal multidimensional scaling (MDS) analysis using the program provided in SPSS, version 11 (ALSCAL). The MDS has the aim of constructing a spatial representation of points from measures of dissimilarities between them. It is better suited for analytical and

[8] This logical claim is supported by the available data. First, almost all manufacturing subsidiaries state as their object of activity "production *and* sales" of some product. Second, almost all of them, for which motivation information is available (50% response rate from the total sample), state sales to local market as the main investing motive (Toyo Keizai Inc., 2003). Third, their revenues are not significantly different from those of sales subsidiaries (about 47% response rate from the total sample). Fourth, expansion with manufacturing subsidiaries substitutes generally the MNE reliance on sales subsidiaries (Somlev, 2003).

representation purposes when the variables are both continuous and categorical than principal component analysis (continuous variables mainly) or cluster analysis (categorical variables mainly), because it allows for both dimensional and neighborhood interpretation of the configuration axes (Kruskal and Wish, 1981). Measures of dissimilarity can be derived from case profile correlation, distance, and association. Correlations are not suitable for categorical variables; therefore, Euclidean distances were used which represent in the present design (Table 1.4) a square root of the city block distances and correlate closely with measures of association like Lance and Williams'. With the layout of the network location pattern as given in Table 1.4 and with Euclidean distances, the counting of manufacturing subsidiaries as sales ones as well is analogous to weighing them with a weight smaller than 2 compared to pure sales subsidiaries. Information of (regional) intensity is suppressed in this design in order to focus on comparison of location patterns; it will be analyzed separately below.

The ordinal MDS output for a random sample of 100 MNEs from the total of 1052 is shown in Figures 1.1.[9] Figure 1.2 gives the Shepard diagram and the transformation and residual plots, which show a smooth scatter around a monotonous representation function with no significant outliers. Figure 1.1 shows that one of the dimensions (x-axis) represents a continuous variable – scope 1 (or analogously scope 2), while the second dimension is connected with the presence of certain regions in the MNE network. Since the program uses all of the columns in Table 1.4, it is natural to expect MNE to order in space along total column sums (scope 1), because of big Euclidean distances between MNEs with high scope and MNEs with low scope. Scope 1 counts twice manufacturing presence in a country and only once sales presence, and is highly

[9] The ALSCAL program in SPSS 11.0 works with sample sizes not bigger than 100.

correlated to scope 2, which counts manufacturing and sales presence only once and equals therefore scope 1 minus the sum of manufacturing presence in the last 14 entries in each column. Scope 2 measurement of network extensiveness is what is normally understood by MNE scope of country presence, while scope 1 incorporates some information of involvement, i.e. intensity defined as manufacturing versus sales activity (not as the number of subsidiaries in a country/region, which is suppressed).

The remaining dimension is related to presence in China, ASEAN, or NIEs. Expectedly, regions higher in terms of MNE numbers influence the location pattern most (however, presence in US is the extreme case of few absences, i.e. few zeros, and therefore it has little differentiating weight). Figure 1.1 shows how MNEs that are present in China and ASEAN respectively tend to cluster in one end of the configuration. The clusters become even more clearly separated when each two regions are grouped as one and compared to the third (region number becomes 13). For example, Figure 1.3 compares China versus the combined ASEAN and NIEs regions. The same distinctive clusters appear when ASEAN or NIEs regions are compared to the remaining other two.

In MDS the number of dimensions that best represent the case dissimilarity is unknown. It has to be large enough to minimize the lack of fit statistics (stress 1), and small enough to produce a simple representation. Usually a type of scree plot is used to add visually the decision how many dimensions to retain. This plot shows the decrease in stress corresponding to the inclusion of each new dimension. Two features of these plots are important in determining the dimension number, the greatest convexity or "elbow" in the line and the stress level associated with it. Under certain normal conditions, stress levels between 0.1 and 0.15 are considered fair, and levels below 0.1 are good (Kruskal and Wish, 1981; Davison, 1983; Borg and Groenen, 1997). The

present sample satisfies all of these conditions except for the presence of a number of ties in the dissimilarity matrix and for this reason Figure 1.4 gives stress 1 values for untied dissimilarities (when ties are left tied the lines shift upward by about 0.04 but the "elbow" places and bends remain unchanged).

Figure 1.4 suggests retaining 3 to 4 dimensions. One of it has been already identified (scope) and the next section confirms this interpretation by sound statistical methods. At present it is necessary to understand clearly the relationships between the other, connected most likely to Asian regions, dimensions. Usually MDS groups are confirmed with a parallel cluster analysis. However, cluster analyses based on a random sample of all the cases turn to be heavily influenced by the scope dimension, producing 3 or 4 clusters with low to high scope. In order to exclude the effect of scope and see the orientation of the remaining 2 or 3 dimensions, I analyze cases on equal scope 1 level (for the eight categories from scope 1 = 3 to scope 1 = 10, and for another two high scope categories with scope 1 from 11 to 15, and from 16 to 28 respectively). Results of MDS for the first 8 categories are well matched by cluster analysis results using within group average link.

The results from analyses on these 10 MNE groups show that there are 3 dimensions (beside scope), presence in NIEs, presence in ASEAN, and presence in China, respectively. They are well separated for scopes below 11 but for higher scopes the location pattern degrades because MNEs on that scope level have subsidiaries in almost all of the three regions. Figure 1.5 illustrates the findings when scope 1 equals 7. Dimensions x and z (horizontal and vertical axis) are clearly interpretable as presence in China and presence in NIEs respectively, while dimension y (suppressed in the Figure) has two separate groups corresponding to MNE presence/absence in ASEAN. Therefore,

the MNEs may be represented on the surface of a sphere split through its center in 8 spherical sectors of equal size, oriented spatially with the sector for absence from China, NIEs and ASEAN sitting lowest at the bottom and the sector for presence in all three of these regions sitting highest on the top. The diameter of the sphere is the fourth dimension, scope. As scope grows, however, the bottom part dwindles greatly relatively to the others, the part adjacent to it up to the "equator" dwindles too, but not as much, while the upper parts, and especially the top, outgrow the rest parts and the structure becomes like a bulb when scope 1 becomes greater than 11. Thus the fourth dimension, scope, is better represented by the "diameter" perpendicular to the surface on which the oriented in this way sphere lies.

For scopes greater than 11 (scope 1 measurement), the location pattern becomes oriented along other dimensions, notably, Brazil, India, EU countries and Mexico or UK or CEE. Therefore, the countries in the world outside the Southeast Asia region and China have little role in differentiating MNEs of low scope, but become important signs of strategic differences for MNEs with extensive subsidiary networks.

1.3.2. Confirming the interpretation of MDS dimensions

This section confirms the robustness of the above dimensions in three ways, first by replication over other random samples, second by regressing the variables depicting dimensions over the configuration axes, and third by replication over the 28 country grouping in Table 1.2.

First, several random samples were selected (the ALSCAL program allows processing of maximum 100 cases) and the results were compared with the chosen above representation. Figure 1.6 gives scree plots of stress 1 values for three of these new

samples. The dotted line presents the analogous to the initial sample (Figure 1.4, straight line) stress values for untied dissimilarities, while the other two lines show how the general stress level increases somewhat due to the presence of ties in the data. In both cases, however, the places of line "elbows" clearly suggest three or four dimensions. It is better to leave a higher dimensional solution for precise statistical analysis of the meaning of each dimension (Kruskal and Wish, 1981), therefore four dimensions are retained. Graphical representations of results, similar to those on Figures 1.1 and 1.5, suggest again one continuous (scope) and three neighborhood (China, NIEs, and ASEAN) interpretations of these dimensions, with magnitude of scatter around the representation function and of outliers similar to those of Figure 1.2. For cases on the same scope 1 level (and smaller than 12), an average link (within groups) cluster analysis produces always three to four clusters of MNEs that have presence in some combination of China, NIEs, and ASEAN regions, depending on the relative weight of each of these regions in the respective sample.

A more objective way (than simple looking at the graphs) of finding variables that underlie MDS dimensions is by using multiple linear regression with dependent variable a supposed descriptor of a dimension and independent variables the axes of the configuration (Kruskal and Wish, 1981). This method requires numeric descriptors. One of the interpretations – scope for dimension 1 - is numeric; however the others are not. A simple numeric approximation of a strategy of investing in one of the three regions (e.g. China) as opposed to the other two is by computing the difference between the average number of sales and manufacturing subsidiaries in one of the regions and subtract from it the same average number for the other two. For example, for MNE1 in Table 1.4 that difference (China vs. NIEs&ASEAN) equals (1+1)/2-(1+0+0+0)/4, or

0.75. For MNE2 on Table 1.4 it is -0.5, for MNE3 it is -0.5, and so on. All similar sums used below are weighted in the same way for number of countries or regions. The resulting variables express passing from one lower than equator side of the sphere described above to the opposed side in three separate dimensions corresponding to the three comparisons, NIEs versus ASEAN and China, ASEAN versus NIEs and China, and China versus the other two. For brevity they are called NtoAC, AtoNC, and CtoAN respectively.

For a random sample of size 100 from all 1052 MNEs, scope 1, scope 2, NtoAC, AtoNC, and CtoAN were regressed on the configuration axes. Standardized regression coefficients and multiple correlations are showed in Table 1.5. It is evident that all descriptors are highly significant and that high confidence can be placed in the respective interpretation of the dimensions. The regression weight of scope 1 and 2, which are analogous descriptors of dimension 1, are highest on that dimension. NtoAC is highest on the fourth, and AtoNC on the third, dimension. Only CtoAN weight is distributed among the dimensions and does not coincide exactly with dimension two (these results remain stable in other random samples and for scope 1 less than 12). There are two possible explanations for this: either dimensions have to be rotated, or the contrast is not relevant. Considering the fact that the dimensions of a MDS solution are hidden and that the proposed contrasts are only numeric approximations of the order between the points, it is remarkable to have such high multiple correlations and regression weights. Another approximation could be the sum of the MNE manufacturing presence in these three regions. Varying from 0 to 3 it shows the position along the perpendicular to the ground diameter in the sphere, i.e. level of involvement for all three regions. It has regression weight from 0.5 to 0.7 on the second dimension

(depending on the sample), with low weight on the rest except for the first, because it correlates positively with scope.

In conclusion, scope and presence in China, NIEs, and ASEAN describe well the location pattern of MNE investments. The relevance of these regions for MNE network differentiation is best approximated with binary variables for presence/absence from the respective region, but could be approximated also by some contrasting combination of these variables. The critical level of scope 1 that influences location pattern is about 12, which corresponds to e.g. 3 manufacturing subsidiaries in each of the above regions, one in US, and 4 subsidiaries in sales elsewhere (or 1 in manufacturing and 2 in sales, or 2 in manufacturing) in the remaining regions from Table 1.3. It is not surprising, therefore that the critical point will be around this value, nor is surprising, for that matter, the relevance of the above regions for the Japanese MNE investment strategies. This is generally the property of good MDS solutions and their value lies in sifting out other equally plausible interpretations (Kruskal and Wish, 1981).

Finally, the analysis is replicated over the 28 regions from Table 1.2. The theoretical limits of scope 1 and 2 are now 56 and 28 respectively. First, MDS for firms with scope 1 equal to eight showed that the solution is trivial in the sense that four dimensions are the four major countries of investment (Thailand, China, US, Taiwan) while the fifth fits the remaining variation. About 600 firms have scope of this magnitude or less and Figure 1.7 shows how two of the dimensions (with y and z axes both rotated to 45°) correspond to the first two countries. Second, MDS for firms with scope 1 between 10 and 24 showed (in a random sample with size 100 from 334 cases) that four dimensions are appropriate and all of them are associated with major Asian hosts of Japanese FDI: Korea, Taiwan, Thailand, Malaysia, Indonesia and few others. This time however, the

points for presence versus absence from a country are not so well separated and the opposing clusters overlap somewhat. What is more significant, presence in major ASEAN countries is depicted by same two dimensions, while presence in Korea and Taiwan form the remaining two. Figure 1.8 illustrates both the cluster overlaps and the clustering of two ASEAN countries in the same region of space. Chinese presence is not associated with any scale and is dispersed in the solution. For MNEs of scope (with respect to 28 regions) between 10 and 24, it seems appropriate to use the above approximation methods for comparing the three major Asian regions. According to the regression results NIEs have highest weights on the first two dimensions, ASEAN has the highest weights on the same two dimensions with opposite signs (R=0.84 and 0.81 respectively), while the other two dimensions are not associated with China.

Lastly, a random sample (N=100) from all MNEs was analyzed for the pattern of their investments over the 28 regions. The scree plot on Figure 1.9 suggests keeping three or four dimensions, because the large elbow at the second dimension is usually unreliable guide (Kruskal and Wish, 1981). When four dimensions are retained one is clearly associated with scope, the other with presence in China, while presence in NIEs, and presence in ASEAN both occupy the opposite ends of the same dimension (the fourth dimension is associated with Indonesia and some outliers and does not appear to have sound meaning). This shows that in fact the meaningful contrast is between NIEs alone and ASEAN alone, while China occupies a dimension independent of these two regions. This final interpretation clarifies the lack of fit for the third contrast and seems to explain the data best. It suggests that only three dimensions are appropriate and Table 1.6 shows how the resulting regression weights and multiple correlations change from four to three dimensional solutions. It also shows this change for the sample with

respect to the 14 regions analyzed above. The results remain stable for other random samples.

Despite the good regression results it is evident that more explanation is needed about the somewhat low regression weight of the NIEs-ASEAN contrast, as well as the regression weight loss for presence in China in some samples. MDS analysis with respect to all 28 regions gives clearer picture of the exact contrasting countries within NIEs and ASEAN regions, and the place in China in the dimensions. By correlating countries with dimensions (for three-dimensional solution, including all possible axis rotations to 45°) a recurring contrasting pattern was found. Beside the scope dimension there is another one that contrasts Thailand and Indonesia with Korea, Taiwan, Singapore and Malaysia, i.e. the MDS solutions suggest that Malaysia belongs to the NIEs camp. Furthermore, this dimension often associates some or all European countries with the NIEs camp as if investing in Thailand and Indonesia stands out alone and isolated (sometimes it is associated with investment in other developing countries). For samples of MNEs with low scopes it is only sales subsidiaries in Europe that are associated with NIEs, but for MNEs with high scopes manufacturing presence in Europe appears as well. As for Chinese presence it is indeed contrasted to other Asian country presence for MNEs with low scope, but is replaced as differentiating factor by India, Mexico and Brazil for MNEs with high scope. This explains the low regression weight of China in samples that happen to include more high scope MNEs. Without loss of generality the third dimension may be interpreted as "populous developing countries outside NIEs and ASEAN".

In order to confirm these more sophisticated interpretations of the second and third dimensions (dimension 1 always appears to be scope because it is correlated with all

regions with a same sign) the new contrasts were regressed over the configuration in several random samples. The results range from very good (R=0.82 with respective weights as expected) to fair (R=0.49) across the dimensions, rotated or not, and this suggests that it is better to give the more conservative general interpretations of the dimensions, although the strong positive association between Thailand and Indonesia leaves pending the question of their differentiation from the other Asian countries.

Therefore, the conclusion is that beside scope two other dimensions describe the data (except for high scope levels), the presence in China, and the contrast between presence in NIEs and presence in ASEAN. The presence in China stands on its own and should not be contrasted with a subsample from the other regions, and the NIE-ASEAN contrast, while describing well the data, is not a hundred percent complete summary of the two separate underlying dimensions.

1.3.3. Relationship of intensity to scope and location pattern

This section presents the final MNE network feature, intensity, and discusses the relationships between the network properties of scope, location pattern and intensity. In the previous section I combined similar regions into broader units; for example, the countries in the world receiving some Japanese FDI into the 28 regions from Table 1.2, and then into the 14 regions from Table 1.3, and possibly in the end into 6 separate continents (and MNEs were selected for the study only if they have FDI in at least two continents). Correspondingly, the possible range of network scope shifts from 106 to 28 to 14, and finally to 6 depending on the spatial partitioning that is employed. This makes sense, when spatial combinations follow theoretically important country similarities like distance from investor, development, culture, economic integration with

other countries, etc., because the reference is to firm global strategy and different partitioning methods represent only different conceptual levels of thinking about firm strategy. Unlike scope, however, it is difficult to define intensity in terms other than that of the separate countries.

In theory, firm multidomestic strategies are those of participation in local level competition and of adaptation of products and processes to host country requirements (Harzing, 2002). Intensity refers to this adaptation process and generally signifies an increased involvement at a local, host level. It is also a proposed measurement for this involvement. In the present context it is computed from the number of *manufacturing* firms a MNE has in any one of the countries from Table 1.1. This is a valid measurement basis because investing in manufacturing requires more commitment of resources and personnel than establishing sales offices only[10] and is likely to lead to more responsiveness to local market conditions, which is the main feature of MNE multidomestic strategies. On the other hand, it is an imperfect measurement because MNE adaptation strategy for a country may differ even between MNEs that have only one manufacturing subsidiary in that country. The next section will introduce a more sophisticated measurement of intensity that overcomes this shortcoming and allows for examination of the reliability of the present - ordinal - intensity measurement.

The measurement employed in this section is an ordinal ranking of MNEs in terms of presence of multidomestic strategies. It has three categories based on the following ratio:

[10] This logical claim is confirmed with the data on subsidiary employees available in the database (83% of the cases), by the difference in the average number of employees (62 for sales versus 383 for manufacturing) which is highly significant even when outliers for manufacturing firms are not included. Furthermore, number of sales subsidiaries is likely to reflect firm distribution methods in addition to involvement with a host country.

Intensity (raw) = (sum of number of manufacturing subsidiaries in all countries for which the MNE has at least two such subsidiaries) / (the number of all countries for which the MNE has at least two manufacturing subsidiaries + 1).

There are 597 MNEs for which this average sum is zero, i.e. they have only one manufacturing subsidiary per country in all of their invested countries and follow global strategy to the extent of their scope. There are 301 MNEs for which this average is equal to or bigger than 1 and less than 2, and which follow some moderate multidomestic strategy. The average numbers then rise steeply for 154 MNEs for which this average is equal to or bigger than 2. The ordinal measurement for intensity is then coded as 0, 1, and 2 for each of these groups respectively:

$$\textit{Intensity (ordinal)} = \begin{cases} 0 & \text{if Intensity (raw)} = 0; \\ 1 & \text{if Intensity (raw)} \geq 1 \text{ and Intensity (raw)} < 2; \\ 2 & \text{if Intensity (raw)} \geq 2. \end{cases}$$

The above definition is based on the assumption that, while one-off manufacturing investment in a country is less likely to represent a MNE multidomestic strategy, a *repetition* of the investment (i.e. creation of at least two subsidiaries as required in the definition) increases this likelihood significantly. The purpose of the intensity variable is to distinguish between the countries that are marginal for MNEs, in the sense that they receive small amount of MNE resources and little attention from MNE management, from countries that are important for MNE strategy. Creation of additional, second, manufacturing subsidiary in a country by a MNE shows clearly that managers' focus is placed on that country and decision is taken to allocate more resources to it as investment location. By deleting the likely marginal locations (where MNEs have only one subsidiary) and averaging the involvement in the remaining on a country basis, an

intensity variable is created that reflects better MNE involvement in the important for the firm host countries. The intensity variable based on counts is intended from the outset as ordinal in order to reduce two types of errors. First, the level of involvement is likely to diminish marginally with increase of subsidiary count as it is enough to observe not more than 3 or 4 manufacturing subsidiaries in a country in order to be fairly certain of this country importance for MNE strategy. Second, host size may justify creation of far greater number of subsidiaries than normal and it is preferable to create an intensity variable as independent as possible from firm location (in small or big countries) patterns. By converting the highest raw intensity levels in a fixed category these errors are minimized.

Intensity is the most novel and controversial variable from the three network properties that the present paper introduces. It is a key variable that is meant to replace the overall MNE "foreign involvement" (e.g. overall foreign sales ratio) with more theoretically sound measure of involvement. Strategic theory opposes firm global strategic orientation to multidomestic orientation, thereby suggesting two different variables: country count (network scope) for the former orientation and involvement *measured on an individual host country level* for the latter. The problem with the overall foreign sale ratio variable is exactly its ambiguity with respect to the strategic orientation which accounts for most of the overall foreign involvement[11].

All MNEs remain in their respective intensity category when intensity is computed with respect to the 28 regions in Table 1.2 instead of all 106 countries, because firm

[11] The ambiguity of overall foreign sales ratio remains even when network scope (country count) is introduced as control of geographical spread. For example, if two firms invest in 5 countries, the contribution of these countries to the overall foreign sales ratio may be distributed as 6:1:1:1:1 for the first and 2:2:2:2:2 for the second. Their overall ratio will be the same; however, the first has stronger multidomestic strategy orientation, although in only one country, than the latter.

strategies appear to be separated even between the seemingly close countries within each region (with more than one country). This fact supports empirically the concept of intensity as level of commitment to one country only. It also allows referring, when one speaks of intensity, not only to the 106 separate countries but to the 28 countries/regions as well, i.e. high intensity in a region with several countries means high intensity in one of these countries *alone* and not across some combination of them. This, however, is not valid for the 14 regions in Table 1.3. Therefore, the level of analysis of intensity in this section and afterwards will be the 28 regions of Table 1.2.

At this level of analysis there is no relationship between scope and location pattern. It was found in the analysis with respect to the 14 regions, that location pattern degrades for scope 1 level of 12 or above; however, in the level of 28 regions there is less instability in the location pattern because there are *few firms with critically high scopes* (only 70 MNEs have scope 1 bigger than 24). The only exception is for presence in China, which becomes irrelevant for differentiating firms with high scope because almost all of them have such presence. Therefore, except for one dimension, location pattern remains stable across scope for this level of analysis and only the relationships between intensity and the other two network features (scope and location pattern) remain unknown.

The relationship between intensity and scope is analyzed by comparison of scope means for each level of intensity. It is evident from Table 1.7 that intensity increases with scope, which shows that global and multidomestic strategies are complementary to each other. The relationship between intensity and location pattern is analyzed by constructing three MDS solutions for three random samples (N=100 for each) from MNEs of each intensity level. The dimensions of ASEAN-NIEs contrast and presence in

China remains relevant except again for Chinese presence in the case of firms with high intensity because they tend to be the ones with high levels of scope as well. The relationship of high levels of MNEs scope and intensity with location pattern poses naturally the question for the situation of the countries, in which such MNEs have high intensity. Table 1.8 shows the distribution of these countries. For example, from the 154 MNEs with intensity of 2, 119 MNEs have more than one subsidiary in China, 101 MNEs have more than one subsidiary in US, 74 MNEs have more than one subsidiary in Thailand, and so on. In order to see possible pattern behind this overlap in investment, MDS analysis was performed over the MNE intensity profiles with presence in a country with more than one manufacturing subsidiary coded as 1, absence with 0.

Because of the generally low scope of MNE investments with high intensity – or shortly, low *intensity scope* – there are always two from four suggested dimensions that fit separate countries (Taiwan and Thailand); however, the other two are clearly scope and the contrasting NIEs (including Malaysia again) – ASEAN (mainly Thailand and Indonesia) factors. China has no differentiating power because most MNEs with high intensity have intensive investment in China. These results remain valid also with respect to the location pattern of intensive investments defined by presence of more than 2 manufacturing subsidiaries in a country (last column in Table 1.8).

In summary, the empirical exploration of the data so far revealed that network scope, location pattern and intensity are important features that are relatively stable across samples and differentiate MNEs by reflecting their different strategies. The most important elements in location pattern are presence in China and presence in NIEs (including Malaysia) as opposed to ASEAN countries. While scope and intensity are positively correlated, for most MNEs location pattern is independent from scope and

intensity. Only for about 150 MNEs with highest scope and intensity presence in China is replaced with other factors like presence in Brazil, UK, India, or Mexico.

1.3.4. Alternative analysis of network patterns based on counts

The MDS analysis carried out above has two peculiar features. First it suppresses intensity information by reducing the parent subsidiary number in each country/region to binary absence-presence of subsidiaries. This binary representation of location patterns of MNEs allows for comparing the overlap of investment pattern between MNEs (the Euclidean distance corresponds exactly to the lack of match in location patterns between firms). Second, it reveals differences in location patterns between MNEs but cannot reveal the pattern similarities. There is another method based on counts, which works successfully with binary *and* count data and can meaningfully distinguish between location pattern and intensity, namely correspondence analysis. This section discusses results of application of this technique, while the following section introduces a method based on numeric variable for analysis of MNE location pattern similarities as well.

The idea behind correspondence analysis is to group together "individuals" with similar "tastes" and differentiate them from "individuals" with opposite "tastes" by maximizing the correlation between "individuals" and "tastes" in a contingency table (Hayashi et al., 1992). This maximization can be achieved by permuting the table along each of any number of dimensions less than the smaller from (number of individuals – 1) and (number of tastes – 1) and by distributing scores for "individuals" and "tastes". For clarity of exposition most researchers present results in two or three dimensions.

Correspondence analysis will handle both binary and count data as entries in a

contingency table of the variables "MNE" (with 1052 categories) and "investment locations" (with twice the 28 categories of Table 1.2, or twice the 14 categories of Table 1.3, once for manufacturing and once for all subsidiaries as in Table 1.4). The comparison of results for binary and count data could reveal a clearer relationship between intensity and location pattern. Therefore the analysis is carried out on both levels, and first for the variables "MNEs" and "investment locations as in Table 1.3" and then for the spatial representation of Table 1.2 where intensity has meaning. For additional clarity of presentation, results for "manufacturing subsidiaries only" and "manufacturing *and* sales subsidiaries" are presented first separately; although the analysis handles well the combined table (as in Table 1.4), because the respective points of these two subsets are always close to each other in the solution.

Generally, it is impossible to make sense of the picture of 1052 different firms and therefore it is quite difficult to assess directly the location patterns that differentiate them. However, this task could be accomplished indirectly by examining the region order in which the correspondence between MNEs and regions is maximized. Then from the permuted table some groups of MNEs and their location pattern will hopefully become visible. Figure 1.10 and 1.11 show how 14 regions/countries are viewed by the sampled MNEs based on binary representation (in 2 dimensions that explain 26% of the inertia). It is clear that both figures have similar configurations and that dimension 1 reflects the region importance as a market, while dimension 2 reflect the region importance as production center (or region overall production cost). This would explain the opposite places in dimension 2 of European countries (without CEE) at the bottom and CEE, ASEAN, rest of Central South America, and rest (Africa) on the top of both figures. Figure 1.10 is reflecting better the second dimension because it refers to

manufacturing subsidiaries; while figure 1.11 reflects better the importance of region markets for MNEs, because it includes sales subsidiaries as well.

From this region ordering and from the permuted contingency table it is easy to see some MNE groupings that reflect the region market relevance. First, there is a relatively small group of MNEs that happen to invest mainly in unimportant, small markets, probably for quite idiosyncratic reasons; this group is followed by MNEs of almost maximum scope and respectively size that makes possible for them to expand until they reach even these distant, small markets; and finally, there is a numerous group of MNEs that invest in the main markets of US, ASEAN, NIEs, and China. If these groups represent genuine strategies for choice of location pattern then two issues are confirmed. First, scope is related to formation of network location pattern and second, the MDS results correctly pointed the main countries (except for US, *which is an issue of similarity* as discussed in the next section) or markets, which have the highest explanatory power or weight because they are at the center of both figures.

The above results are useful not only for confirming the MDS findings, but also for comparison with correspondence analysis based on counts. In this case I expect that a third dimension will be important to capture the different levels of "region involvement" according to counts (in the context of 14 regions one cannot speak of intensity in terms of its country-based definition). Figure 1.12 shows the region configuration in 3 dimensions (explaining 30% of inertia) based on counts. The figure shows simultaneously manufacturing and all subsidiaries. The regional configuration of the latter is numbered with symbols from 1 to 14 corresponding to the order and number in Table 1.3, while the configuration of the former is shown with symbols from 15 to 28 corresponding to the same order and {number in Table 1.3 + 14}. It is clear that

dimension 1 corresponds again to "production costs", especially with its "manufacturing subsidiary" points, while dimension 3 corresponds to importance of markets. The significant finding is that substitution of binary data with count data results in a dimension that reflects only China (dimension 2). Three-dimensional results with *binary* data do not produce clearly interpretable third dimension, and do not differentiate China from the remaining locations. This shows that China has to be regarded separately from the remaining world as "a world of its own" for Japanese MNEs, which choose to expand with repeated investments and greater intensity in this country. This is confirming the MDS result in section 1.3.3 that firms of high intensity are *similar* with respect to their choice of China as investment location, thereby the differentiation effect of this dimension vanishes.

When the spatial representation of 14 regions is replaced with one of 28 regions (Table 1.2) the same dimensions and dimension interpretation are found. China again emerges in a third dimension when counts replace binary data, although this time it is not that remotely separated from the bulk of the other points. Interestingly, the closest point to it on this dimension is not US or Thailand, which are in the center of the distribution, but Hong Kong. On the opposite side, at a distance to the center as much as Hong Kong (China), is restAfrica (Canada), while the remaining points cluster between the center and restAfrica.

The above findings are based on subsidiary counts and suggest possible ways in which MNE strategies differ. It is necessary to explore further the reliability and validity of network scope, location pattern and intensity, and to analyze the underlying variables for these variables in order to confirm that network patterns are theoretically sound.

1.4. Validity and reliability of network scope, location pattern and intensity

This section introduces another method of measuring MNE investment strategy in order to assess the reliability and validity of the concepts of network scope, location pattern and intensity. The previous section relied mainly on binary and count level data for defining firm investment patterns. These data depict events in firm history, or more exactly previous decisions to create a subsidiary in a foreign location. It is assumed that the very act of entering into a foreign location by a MNE is an expression of firm interest and focus on the host, which eventually lead to increased knowledge and control of the respective environment. However, the level of focus placed by firm management on any location is related to the extent of the emphasis the firm puts on this location. It is rational to expect that any two regions a firm has entered will differ in the level of emphasis that is placed on them by firm management. A realistic way to measure this emphasis is to analyze subsidiary output or asset levels. Sales and amount invested have been used in the literature to characterize MNE investment strategies (Rugman and Verbeke, 2003; Sporleder and Liu, 2004); however, some qualifications are necessary in this respect.

The concepts of scope, location pattern and intensity, as defined in the sections above, are related to existing in the business literature concepts of firm international strategy. Some authors (Rugman and Verbeke, 2003; Emmott, 1993), for example, are proponents of the "multi-regional" strategic concept, which broadly regards firms as specializing in some region of the Triad (North America-Europe-Japan) and rarely in all of them. These authors use firm sales as indicator of firm emphasis and find that very few firms are global MNEs, because most of them focus only on one region. By

dividing the locations into these broad units Rugman and Verbeke (2003) actually speak about investment location pattern (where), scope (how many) and intensity (to what extent each), although they do not differentiate between these concepts and use the less valid variable of sales to final markets as a proxy for firm strategies[12]. Sporleder and Liu (2004) use investment scale in the context of acquisitions, where scale is the invested amount divided to firm assets, in order to differentiate between firm strategies. However, they use scale in the context of one-country-only or for individual transactions, and not for separate countries, as in the present research.

The main propositions of the present thesis refer to firm international activities and the supposedly increased knowledge and control of firm environment thereby; therefore, export or sales at destination revenues are inferior measurements to sales or assets at source (of subsidiaries themselves). Data on subsidiary total assets are generally unavailable, while subsidiary sales data have about 50% to 60% non-response rate (Toyo Keizai, Inc., 2003). Nevertheless data on subsidiary equity capital are almost 100% available and can be used as valid, although imperfect, substitute of total assets in the context of overseas investment. Subsidiary equity shows the amount invested by the parent at time of entry, as well as subsequent increases in this capital (Toyo Keizai, Inc., 2003). However, it does not show the other capital sources of the subsidiary, like reinvested earnings and local borrowing, therefore it is not reflecting subsidiary total assets generally. In the particular case of Japanese foreign manufacturing affiliates, according to statistical data reports by Hasegawa (1997), equity and reinvested earnings account respectively for about 45% and 44% of the capital, while local borrowing

[12] Sales at destination is an inferior measurement because of its bias (similar to the bias of overseas sales ratio) to hosts with large market at the expense of hosts with efficient production factors, where firms may invest in order to produce and export to other countries. A better measurement is subsidiary sale levels (at production source), or subsidiary total assets.

usually amounts to 10% of the total subsidiary capital/liabilities. While there is some variability in local fund raising (from 10% to 30%) and local profit reinvestment (from 40% to 60%), equity capital reflects always about 40% of subsidiary total assets. Thus, while a ratio of subsidiary equity to firm total assets underreports firm investment scale and extent of internationalization generally, it is a valid reference for purposes of *comparison* among the MNEs themselves, for which it is used below.

Due to missing data on Japanese firms' non-consolidated total assets, the sample size is reduced from 1052 to 821 ultimate Japanese parents with 10729 subsidiaries in the world. The missing 231 firms are mainly unlisted enterprises with about 2 or 3 overseas subsidiaries, so it is unlikely that their level of internationalization is high. For the sample of 821 firms the ratio of overseas subsidiary equity to parent non-consolidated total assets was computed. The sum of these ratios over all subsidiaries outside Japan for each parent gives parent overseas investment scale[13]. The dispersion of this investment scale over the globe gives another way of measuring parent network scope, location pattern and intensity, and opportunity to assess measurement reliability. The remaining part of this section will employ the spatial representation of Table 1.2 to discuss scope and intensity (as it was mentioned above intensity in a region of more than one country in this table refers to the intensity in exactly one of the countries in the region) and the spatial representation of Table 1.3 to discuss location pattern. For the latter discussion the general division to major Triad countries (following Rugman and Verbeke, 2003) is used as well in order to compare the findings for location pattern with

[13] In the top ten firms, which have overall scales of 44 to 63%, there are two firms producing for consumer markets (Uniden Corp. and Sony Corp. in electronics), and eight firms producing for industrial markets (Rorze Corp. in automation systems and robotics, Yamato Kogyo in iron and steel, Kyoden in printed circuits, and five other firms in automotive parts, four of which are related through equity and sales destination to the big Japanese car producers and have overlapping location pattern with them).

previous results.

The numeric measurement of investment scale in each region of the world is advantageous to the counts measurement employed in the previous section in several respects. First, with regards to scope both measures would give exactly the same results if scope is computed for scales bigger than zero. However, the numeric ratio of subsidiary equity to firm assets allows us to define some threshold of parent emphasis on each location above which we may regard the parent commitment as reliable and stable. Figure 1.13 refers to the number of commitments for all 821 firms in each of the 106 countries with Japanese investment. Because the subsidiary number per invested country for each parent is equal to *or bigger than* one, there are 6121 such commitments (made by creating 10729 subsidiaries). About half of them are of scales less than 0.2%, which is the median scale in this respect (country investment scale is all subsidiary equity in a country divided to firm assets). Figure 1.13 shows the tail of small country commitments, which are likely to be of more unstable, transitory nature. Therefore, we may argue that investment scope is better measured by commitments of scale bigger than 0.2. This new scope variable correlates highly with the old one defined simply by presence in a country (r=0.74), which supports the reliability of the operationalizations.

Second, as was mentioned in the previous section, intensity may be quite high even when a firm has created only one subsidiary in a country. The investment scale, when distributed among the separate countries of investment is a much better measurement for country investment intensity of each parent. In order to analyze the correlation between the ordinal intensity based on averaged subsidiary counts (over countries with more than one subsidiary) and the numeric intensity based on country investment scales a contingency table is created for two critical scale levels, 1% and 10% of firm total

assets, and is shown in Table 1.9. This table shows that generally there is a fair amount of correlation between both variables, which has its maximum for scale threshold of about 2% of firm total assets, which is also shown. For 10% scales the quantities in the two lower left cells in the contingency table increase dramatically, which reflects the omission of some investments which are truly intensive. If repetitive manufacturing investments in a country are sign of increased commitment by the parent as is natural to assume, then the critical scale level should be such as to leave few cases in these lower cells. The 10% level quantity clearly reflects something more than intensity: the unusually small parent size for most firms (mainly related keiretsu supplier firms) with this average scale level. On the other hand, the 1 % level leaves many firms with only one subsidiary per country as intensive investors (the uppermost right cell). While this is expected to be correct to a certain extent, there is risk of counting too many investments as intensive, if the scale level drops further to the median of 0.2%, which is assumed to represent a stable, non-transitory investment, albeit not necessarily intensive. The scale level that balances best these conflicting errors is about 2% of parent total assets. The correlation calculated from the contingency table between "counts" intensity and "scaled" intensity for this scale level is r=0.64, which shows a high degree of reliability of this measurement as well.

Third, with respect to network location pattern, the numeric variable has the advantage of reflecting both parent regional focus (invest where) and level of emphasis (invest how much compared to the other regions). In the location pattern analysis in the previous sections, for example, I had to separate general scope from intensive scope and to report the latter in Table 1.8. Furthermore, the comparison of firm general scopes could not produce dimensions on which firms are similar (the almost universal presence

in the USA), but only dimensions on which firms are different. With the scale variable both the regional focus and the regional emphasis of a MNE can be integrated into one whole framework. The possibility of using a more powerful tool, principal component analysis (PCA), is the fourth way in which the analysis benefits from the numeric nature of the variable that serves for firm comparison.

I carried PCA of firm regional strategies on two different spatial representations of Japanese firm investments. First I divided world regions in five continents – Asia (including Australia and New Zealand, as well as India, Pakistan, Bangladesh, but not further to the east), North America (Canada, Mexico, and USA), Central and South America, Europe (including Turkey but not Russia), and the rest (Africa, Arab world, Russia) – which include the Triad regions, with the aim to test the proposition of the existence of multi-regional "MNEs" (Rugman and Verbeke, 2003) by use of the present sample of Japanese firms with the strongest international activity. Then I divided the world regions in the lines of Table 1.3 in order to confirm the reliability of NIEs versus ASEAN and China-not in China dimensions that were found relevant in the previous section. Although all variables (MNEs in this case) are in the same (scale ratio) units, the variances are quite different, because they reflect overall investment scale. The use of the covariance matrix of the original data will give more weight to the strategy of firms with high investment scales. While these firms are important by themselves (their strategy often seems to follow their clients' as the next section will discuss), there is no theoretical reason to consider their strategy as more important than that of the other firms. Therefore, I use the correlation matrix of the original data in order to weight all variables equally (Jackson, 1991). When firm investment scales are correlated for five-continent representation, four principal components are found that explain 100% of

the total variability. With correlations based on the 14 regions from table 1.3 the first seven principal components (pc's) were deemed sufficient by the scree plot stopping rule (Figure 1.14). They explain 96% of the total variability. In order to interpret the pc's in both levels of analysis of firm global strategy I compute their correlation with the respective firm regional investment scales, scopes and overall overseas scales. Table 1.10 shows these correlations for firm strategies over five continents. Table 1.11 shows the same based on the 14 regions of Table 1.3.

Table 1.10 shows clearly that there exists separation between the Triad country importance for firm strategies, and the latter can indeed be referred to as intra-regional (Asia for Japanese firms) and inter-regional, or focused on one region versus balanced strategy of investment in several regions (Rugman and Verbeke, 2003). At least in case of the analyzed Japanese firms, there is peculiar connection of substitutability or connectedness between certain regions. First, PC 2 has firms that invest intensively in Asia but not in North America on the one end of the dimension, and firms that invest in North America but not in Asia on the other. Second, PC 1 shows juxtaposition of investment in Asia versus presence in Europe and other continents, while PC 3 refers to presence or absence in Europe, which is the only dimension without strong contrast between investments in different regions. Finally, PC 4 shows again a contrast between choice of investment region outside the Triad, which seems to be of "either-or" type. Except for PC 3 and possibly PC 2, it is hard to claim that these contrasts reflect some deliberately taken investment decision on part of firm management and not idiosyncratic one-off investments that preclude the other option.

The more detailed spatial representation will hopefully shed more light on firm investment location patterns. Table 1.11 presents seven PC correlations with the regions

in Table 1.3 except for two slight modifications to enhance simplicity of representation (India, Pakistan and Sri Lanka are combined with ASEAN, which includes Malaysia; and Brazil is combined with the rest Central-South American countries). PC 1 now clearly shows the importance of USA in the global strategies of Japanese firms. Firms with high investment scale, scope and intensity are likely to have sizeable investment in this country, although the remaining location pattern is unrelated to this dimension. PC 2 represents firms with low-intensity, low-scale investment in Asian countries, which are contrasted to firms pursuing global investment strategies beyond the intra-regional involvement. Clearly this dimension reflects a strategy of low expansion – either to serve the domestic market, or to fill some niche in the Asian markets. There are 208 firms in the sample with *total* overseas equity scale less than 2% of their total assets. Their expansion is likely to be centered on the Asian region.

The next two pc's, PC 3 and PC 4, refer to contrasts between regions in Asia very similar to the dimensions found in the previous section, which confirms their reliability. The final pc's, PC 5, PC 6 and PC 7 refer to European presence and clearly differentiate between "only UK-based" presence in Europe, a more balanced one in UK and/or Northern Europe, and presence in Southern Europe, contrasted with Latin America. The latter is more likely to be coincidence rather than deliberately made investment choice. These results show that the limited "Triad" spatial representation may conceal a diversity of internal regional contrasts, mainly along center-periphery lines, in firm strategic investment choices.

1.5. Variables that underlie network patterns

This section investigates what variables underlie the three network features that the above empirical exploration of the data revealed. Internalization theory suggests that firm proprietary assets or resources in general make firms grow and invest internationally, thereby increasing their scope (Caves, 1996; Penrose, 1972). Location theory contrasts countries in market size, factor endowments, geographical and cultural distance from the investor country and political and economic systems (Head, 2005; Moon and Lado, 2000). Strategic theory contrasts MNE multidomestic strategy of local adaptation of products and processes with MNE strategy of increasing scope of operations (Harzing, 2002). The present section associates these theoretically relevant variables with the respective network features in order to examine and support the validity of the latter. All measurements refer to MNE established subsidiaries, which underestimates to a certain extent the role of complementary exporting activity. The main justification for this omission is that the MNEs in the present sample have been sifted from many other small MNEs that are likely to rely mainly on exports. The selected MNEs are firms that make efforts to increase the proximity between them and their clients, at least by creation of sales subsidiaries. These are also firms that make efforts to grow on a global level and that have investments in at least two continents. By using established subsidiaries as main measurement unit, the following sections test the hypotheses that network scope, location pattern and intensity are determined by theoretically suggested factors such as resources, path of growth, and product features.

1.5.1. Variables that underlie network scope

The theory of firm growth suggests that firm resources including firm knowledge and managerial competence are the main factors behind firm international expansion (Penrose, 1972). This claim involves a difficult to measure phenomenon, managerial initiative and knowledge, and a more objective component, technological resources. Many authors focus on measuring the effect of knowledge and resources on firm growth and claim they are positively related (Caves, 1996). The main reason for this claim is the supposed failure of the market for technology and knowledge intensive goods due to information asymmetry (Casson, 1995). This is often criticized on the grounds that FDI is influenced by external pressures like political regulations and barriers to trade, as well as by bureaucratic complexity resulting from international expansion (Parey, 1985). In either case, however, firms become MNEs only when they are able to organize enough resources and knowledge to respond to the external pressures and to manage the cost of hierarchy. The same two factors account, therefore, for firm growth and network scope.

Hypothesis 1.1. *The higher the level of firm resources and knowledge the higher its international growth and scope.*

Firm resources are often measured by R&D and advertisement intensity levels. These measures are not without shortcomings, however, because it is not clear when and to what extent the results of R&D and advertisement efforts materialize. A more encompassing measurement of resources that pertains only to realized potential and that moves relatively stable in time, is firm total fixed assets. This measurement is taken on non-consolidated level in order to avoid the tautology that more subsidiaries mean more resources. It is also included in logarithmic form to account for its diminishing

influence on the constrained dependent variable, scope. Knowledge has been measured by quite sophisticated model designs (Vermeulen and Barkema, 2002), however, in the present context a simpler measurement is used – age of first international expansion, i.e. first subsidiary. The aim is, rather than analyze in details the relevant elements of knowledge, to control for time differences in the investment profiles, which are likely to have positive association with scope. Industry controls are included also in the model, because type of industry is likely to constrain or influence the extent of firm international activities. Firms from industries that produce for the industrial market, like chemical and resource based including metals, as well as industries in which Japan does not enjoy overwhelming competitive advantage, like foods and textiles, are likely to have lower expansion scope than industries such as electronics, machines, and automobiles. Therefore, an appropriate dummy reference category is chemicals, which is between the two poles, enjoying some competitive advantage (OECD, 1997) and producing predominantly for the industrial market. A multiple linear regression model is used to account for the significance of each underlying variable for MNE scope. Descriptive statistics for MNEs and regression results are given in Table 1.12 and Table 1.13. The sample size is 757 due to missing asset data on 295 MNEs.

Both manufacturing and all subsidiary network scope of the analyzed 757 MNEs, for which data on resources is available, is significantly and positively associated with their size (measured by assets) and with the age of their first subsidiary in any industry. This supports on the average hypothesis 1.1. The MNE industry controls reveal that the scope of all subsidiaries for MNEs in chemical, resource-based, metals, and to certain extent construction industries (all producing exclusively for the industrial market) is bigger than the MNE scope for the food and textile industries (of low technological

intensity and cost competitiveness), but lower than that of machine, electronics, automobile and precision industries. Repetition of the analysis with automobiles as a reference category shows that MNEs in precision industry have by far the highest scope, followed by electronics and automobiles and then machines, with differences between these groups significant at 0.05 level. Figure 1.15 shows the relative scope for all industries. Tests of structural stability revealed that the difference is due to a change in the intercept, not the slope coefficients of the scope on asset regression curves, i.e. significant interactions are not present in the model.

This effect of industry on general MNE scope is expected, because MNEs that sell high technology goods (for which theoretically FDI occur) to general consumer markets (where clients are more dispersed) are likely to have higher scopes than MNEs in traditional industries selling to industrial clients. The effect of industry on scope of manufacturing subsidiaries, however, is quite different. Figure 1.15 shows how the large general scope of firms in electronic, machine, and precision industries depends on sales subsidiaries, compared to the scope of firms in automobile industry. This may be explained by transportation cost differentials, likely to be higher for the latter industry, as well as by different level of adaptation to local markets, necessary for efficient use of the respective industry products. If the latter is the case, the firms in this industry are likely to have high network intensity as well. Host government political pressure and protectionism are other likely factors in case of automobiles, which is an industry highly protected by many countries with large markets (Strange, 1993, Deutsch, 1999). High production scope in resource-based industries is also not surprising, because the location of these firms is strongly dependent on local endowments.

The analysis of industry effects on scope is complementary to the testing of the main

hypothesis of this section, and it prepares also the ground for the following discussion of network location pattern. This analysis showed that the network of all subsidiaries depends on firm growth factors like resources and technology and its location pattern is likely to be shaped according to profit opportunities, which are associated with location features like large market and high growth. One of the constituting elements of this overall network, the network of manufacturing subsidiaries, however, is likely to be much more irregular in the sense that it depends on more location factors. Factors like government policy, resource endowments and regional integration of a country also shape the manufacturing network, in addition to host market size and growth. Exposure to, and respectively importance of, location factors is greater in case of investment in manufacturing. Figure 1.16 shows how countries differ with respect to the type of MNE presence in them. The following section analyses in detail the MNE strategic approach with respect to investment locations.

1.5.2. Variables that underlie network location pattern

There are two interrelated factors likely to shape MNE location choice: the MNE strategic objective of investing in a location and the location features relevant for the investment. The first is also about firm strategic choice of level of growth, while the second involves power relationship as well. The theory of firm growth suggests that as long as there are profit opportunities and management is capable of exploiting them firms will expand, both domestically and internationally (Penrose, 1972). This suggests that, if management is capable, firms with competitive advantage will grow to cover at least the major world markets in an evolutional path/process, whose stages are shaped by geographical distances between locations and MNE country (Tanaka, 1991) and by

differences in MNE "departure" times, i.e. the year of first expansion. This claim focuses mainly on the factor "market" in the firm strategic diamond (Porter, 1985). Naturally, expansion increases competition and this process creates another strategic use MNE may have of locations, namely for cost-efficient production that will position the firm better than its competitors on the global markets. This claim focuses on the factor "competitors" in the firm strategy. It adds another stage in the firm evolving growth path, which involves other location features than market size, linked to efficiency in production, like labor costs, regional economic integration, and host culture.

If the evolution hypothesis is correct then firms from one investor country and of similar levels of resources and similar timing of first investments should have also similar investment paths which include first close, then distant large markets, and then - at some similar point of time in the path - efficiency seeking investments as well. In this case the contrast in network location patterns that the exploratory analysis revealed is based on firms that appear to be on different stages in their investment path. The hypothesis may not be correct, either because firm management is incapable of initiating growth (Penrose, 1972), or because there are other reasons for firms to decide that some level of growth is optimal for them and further expansion is unnecessary. An alternative hypothesis or claim is that firms follow not continuous but discrete levels of expansion. Some firms reach only a basic level of expansion in closest large markets, other firms are able to make the "jump" to the next level of including more distant markets and possibly cost-efficient investments in their network, and a third group of firms manages to grow to the extent even to cover "the last frontiers of growth", i.e. distant, new and unexplored profit opportunities. Then the observed location pattern contrasts between ASEAN (without Malaysia) and NIEs countries will truly represent

different MNE strategies.

Hypothesis 1.2(a). *Firms from one investor country follow similar evolutionary investment paths, because management is efficient and growth is always optimal; i.e. with time firms are likely to invest in similar regions, other things being equal.*

Hypothesis 1.2(b). *Firms from one investor country follow different, discrete investment paths not likely to converge with time, because management is inefficient or growth is not always optimal, other things being equal.*

These hypotheses, together with their combination (that firms may follow both types of investment patterns) form a set of alternative propositions. There are several ways to create models for testing them. One is to create a dependent variable similar to scope, but measuring some concrete relevant feature of locations where MNEs invest, either in manufacturing, or in other activity. Distance from Japan[14] is very appropriate in this respect because its importance for international transactions is theoretically and empirically supported (Head, 2005). Firms start with close locations and then expand to more distant ones. If all firms (with similar size and timing of first investment) follow evolutionary growth paths then the mean distance will grow with time, and firms with recent time of first investment will have lower means than firms that have expanded early in time, other things being equal. What is more, the variance within each group should be similar, or equal. If all firms follow discrete paths then some will grow with time and some will stall their expansion, which will increase the variance within each

[14] This refers to distances between capitals. For regions with more than one country the capital of the country with the greatest concentration of Japanese MNEs is used, i.e. India, UAE, Argentina, Sweden, Germany, Belgium, UK, Spain, Italy, Hungary, Australia, and South Africa in the order of occurrence in column 1 of Table 1.14.

group. This model may be tested by one-way ANOVA which accounts for firm size as well. Table 1.14 gives descriptive statistics for the countries and Table 1.15 gives ANOVA results for this model. Two countries, China and US, has been omitted from the calculation of distances, because the first properly belongs to a different dimension (discussed below), while the second is almost a universal investment location. These omissions are likely to sharpen the analytical power of distance as an indicator of expansion. In its calculation, MNE subsidiaries from all industries have been included.

Another way of model creation is to test directly the evolution of the NIEs (including Malaysia) to ASEAN contrast for stability over time. It is indeed necessary to do so, because support of hypothesis 1.2 (a) by the first model does not necessarily mean that MNE strategies converge in an evolutionary process of expansion. The MNE expansion may follow evolutionary path and yet the MNEs may stick to different regional patterns of investment, e.g. investing first in ASEAN and then expanding elsewhere but not in NIEs, or investing first in NIEs and then expanding elsewhere but not in ASEAN. A model is needed to check whether with expansion regions are generally mixed or held separate in MNE strategy. The focus of the model is on NIEs as opposed to ASEAN because the empirical exploration of the data above found this contrasting dimension most relevant for differentiating the Japanese MNEs.

Therefore, a ratio is computed between number of countries in ASEAN where a MNE is present and number of all countries in the two Asian regions in which this MNE is present (in any kind of industry). Small and big ratios express separation of regional investment, while a ratio around 0.5 shows integrated regional strategy. If firms follow discrete investment strategies then small and big ratios are expected not to change with time, holding firm size fixed. That is to say, if we take the absolute value of the

deviations from this mean value, the mean of this new variable should not change with time[15]. The variances for different time groups are likely to be equal, as well. This also suggests use of ANOVA and results are given in Table 1.16.

ANOVA results for firm size suggest that it is appropriate to divide the firms in small, medium and big size categories, with respect to distances to investment locations, and in small versus medium and big with respect to the ratio contrasting the Asian regions. Small firms have assets (in billion yen) less than 11 (408 firms), moderate have assets bigger than 11 but less than 105 (330 firms), and big sized firms have assets of more than 105 (19 firms). ANOVA results for firms of big size are unreliable because of small sample size (for distances as dependent variable). For contrasting ratio as dependent variable, sample size is reduced because of exclusion of firms with no Asian presence.

The results in Table 1.15 and Table 1.16 show that time of first investment is related to different location patterns, independent from firm size. These results clearly suggest that time is a factor for location strategies, which supports hypothesis 1.2 (a) and does not support hypothesis 1.2 (b)[16]. Firms differ with respect to starting point of time and starting location and these two factors are most likely to explain the contrasting location

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[15] Using a mathematical expression let, for a MNE_i, n_i = number of ASEAN countries where a subsidiary exists (n=1 to 4), m_i = number of NIEs countries where a subsidiary exists (m=1 to 5); then the ratio $r_i = n_i / (n_i+m_i)$. This ratio is small for firms with NIE presence only or predominantly, is big for firms with ASEAN presence predominantly, and is about 0.5 for firms that invest in approximately equal number of countries from both regions. The new variable is $s_i = |n_i / (n_i+m_i) - 0.5| = |(n_i-m_i)| / \{2*(n_i+m_i)\}$. If with time the strategies converge in the sense that ASEAN-oriented firms start investing in NIEs and vice versa, then in more recent time periods the values of s_i will be closer to zero, i.e. its mean and variability will decrease. If strategies do not converge its mean and variability will stay relatively constant.

[16] There is one shortcoming with this conclusion. It assumes similarity between firms with recent expansion and firms that expanded early in time in the sense that they are all alike in their motivation to exploit all existing profit opportunities. Only on this basis it is expected that their evolution will be similar. However, business environment and profit opportunities change with time, although it is not clear exactly how this will affect firm growth. On one hand the increasing level of integration of the world countries suggests that market factors are unlikely to impede growth for firms at present and new firms have the opportunity to repeat the growth path of the older ones. On the other hand there was a big change in the Japanese environment (push factors) of these firms. Figure 1.17 shows that many new firms started growing in the bubble years and it is not clear if they will be able to repeat the growth pattern of the older firms. This question refers to the time dimension that the present study does not address.

dimension found in the exploratory study. The data in Table 1.14 show that Japanese firms tend to choose NIEs for their starting location because the average manufacturing subsidiary age is closer to the time of first investment of the parent for these countries than for ASEAN ones. The different motives for these two regions suggests that investment in NIEs are likely to be part of more integrated distribution network, supposedly linked to other parts of the world, while investment in ASEAN are somewhat separated from the whole, gravitating to the big market size of these countries and their use as cost-efficient locations for goods that are more likely to be exported back to Japan.

Table 1.14 also clearly shows the characteristics of Chinese investments likely to be responsible for the location of this country on a separate dimension of MNE strategy. The MNEs investing in China are somewhat younger and smaller than the average, with the second lowest network scope after investors in US. However, this may reflect the grater concentration and therefore diversity of investors. The most important feature is the young age of the subsidiaries there (second only to Vietnam and CEE) as well as the prevalent motivation to use the region for exporting back to Japan. The former is again an evolutionary explanation and it remains to be seen whether with time most MNEs from Japan will set subsidiaries in China thus decreasing its differentiation effect. Some relevance of this dimension is likely to remain even in such case, however, because it represents markedly different type of cost-efficient strategy that aims at increasing MNEs competitiveness at their domestic market (Table 1.14, motive D). It is a strategic component dominant for smaller, quasi-MNEs that were excluded from this study. Another reason why China stays as separate dimension is its relation to intensity that was found by the correspondence analysis.

The conclusion of this section is that different "departure times" for MNEs and several location variables account for differentiation of starting or initial location patterns into two categories of "broad" and "narrow". The former includes countries with somewhat smaller markets, which are nevertheless parts of a wider distribution network that underlies the MNE global competitive strength. The latter includes less developed, bigger markets, somewhat separated from the others and supporting MNE competitive strength on MNE own domestic market[17]. The next logical step is to shift the focus from networks and relationships therein to network constitutive elements, the markets themselves. It is necessary to account for the reasons for intensive investments in some markets, as well as for the independent effect countries have on firm strategies.

1.5.3. Variables that underlie MNE investment intensity

Theory of location adaptation suggests that MNE are often involved in intensive competition on local level (Harzing, 2002; Calof and Beamish 1995). It is logical to expect this competition to be more intensive, and MNE intensity to be higher, in bigger markets. Tables 1.8 and 1.14 show that Singapore, Taiwan and Malaysia have disproportionately higher intensive investments relative to their market size, which suggests that distance to the host market is a factor as well. If intensity is about competition at host market only, then it is likely that it will differ according to product because each product requires different extent of market adaptation. This was already suggested in Section 1.5.1 where MNEs in automobiles were found to have the most

[17] Interestingly, there are four regions in Table 1.14 mainly in distant from Japan areas in the Southern hemisphere, for which the relative role of internal compared to externally provided incentives in motivation is small (Kreinin et al., 1999). This suggests that they are on the periphery of MNE production networks. Exclusion of these regions is likely to sharpen the analytical power of the tests in chapter 1 of the present study.

extended production networks, relative to the other industries. This suggests that they are likely to have most intensive networks as well, or generally, that intensity is different across product type.

Hypothesis 1.3. *Due to inherently different need of local market adaptation for different goods, intensity levels are not likely to be the same across product groups, and automobiles are likely to have a high intensity level.*

The ordinal nature of the dependent variable, intensity, and the categorical nature of the independent variable, industry, suggests a chi-square test of independence, although ANOVA could be used if intensity is regarded as numeric. I confirmed with ANOVA analysis that the means and variances of first investment year of MNEs in the different industries are the same and therefore the results in Table 1.17 are not spurious because of the time factor. They show that intensity is not independent from product group, with automobiles having relatively high intensity levels. Beside the trivial "other industry" group consisting of small firms unlikely to have high intensity levels, only four industries account for this significant result (without them chi-square statistics is insignificant), including automobiles. Machines have the lowest intensity levels probably because of high level of standardization of production processes and little necessity to adapt to local industrial markets. On the other hand products in textiles and automobiles are most likely to need greater MNE involvement on local level in order to conform to local tastes. Incidentally, these two industries have the highest joint venture ratios, defined as the number of joint ventures to all subsidiaries where joint venture is any subsidiary with local participation in equity of at least 10%. The ratios of textiles and automobiles are respectively 0.52 and 0.48, while the average is 0.39. This shows

that local partners are used extensively by MNE with intensive investments, probably because of necessity to use the complementary knowledge and resources of the former.

ANOVA results for ordinal intensity viewed as numeric confirm that means are highest for textiles (0.96) and automobiles (0.76), followed however not by chemicals but by food industry (0.74). Machine and "others" industries have the lowest means (0.34 and 0.33). The difference in means is significant at the 0.01 level. Food industry has the third highest joint venture ratio of 0.46. Clearly the nature of food products requires as well high extent of local market adaptation. Therefore, both the ANOVA and chi-square test results support the claim that higher intensity levels reflect greater MNE involvement in the local market.

1.6. Conclusion

The analytical results in the preceding three sections confirm that network scope and intensity are valid concepts for describing MNE investment strategy. They suggest also that the observed differences in network location pattern are due to different expansion timing, including expansion in China. The latter however, should be retained as a variable that differentiates MNEs because most of these investments are intensive and China was isolated as a special case in correspondence analysis results.

With the above results, it is appropriate to claim that firm network scope, intensity, presence in China and investment timing are four variables describing competitive advantages that each firm has in addition to its level of resources and technology. Therefore, the inclusion of these variables in studies of firm behavior, and especially in analysis of firm performance, is likely to contribute to the validity of results. An

investigation of their actual effect on performance is done in Chapter 3.

It is necessary to discuss here the relevance of these variables for MNE in general. The first two – scope and intensity – are properties of MNE networks whose increase is likely to add to the competitive advantage of any firm, not only those from Japan. Increased scope is identical to the extent of internationalization of a firm and its international experience, which is a major part of firm competences (Delios and Henisz, 2000). Increased intensity reflects another part of firm competitive advantage, namely accumulated host experience, or high level of involvement with and adaptation to host markets. It is a sign that a firm had overcome to a certain extent the liabilities of foreignness and the relational separation from its host environment (Head, 2005).

Network location pattern, on other hand, is dependent evidently on the geographical location of host countries with respect to that of the investor country. This observation does not, however, nullify entirely the importance of this network element for MNEs in general, because similar geographical relations of centre-periphery with respect to economic development exist elsewhere. MNEs from Europe and US have their own periphery of host countries in which investments may order in similar patterns as the ones observed in case of Japan. It is a subject of another inquiry to determine whether evolutional convergence and use of some specific country as cost-efficient factor for domestic competition exist in case of MNEs from other nations.

Finally, it is important to emphasize again that the observed network patterns arise from exploration of MNE strategic decisions with respect to investment locations and timing. Such analysis assumes that the MNE is the active participant in the growth process and that other MNEs behavior and host country characteristics are only contingencies of the external environment that affect general level of competition and

profit opportunities. Such assumptions underlie location theory and the theory of MNE bunching behavior with respect to investing (Makino and Delios, 2000). However, there are some aspects of the strategic process that are more directly determined from elements in the environment over which MNEs have no control. One example is the decision to follow the investment of another, client firm from a previously existing client-supplier relationship[18]. More often the examples are from the sphere of interplay between MNE strategy and host country sovereignty. The realization that what MNEs may want from a country may be counteracted by what a country wants from MNEs necessitates broader perspective and assumptions that will benefit generally the analysis of network patterns. The improvement will depend on the extent to which host countries are the active part in the formation of MNE networks. This broader perspective requires inclusion of host bargaining power and culture distance considerations in the analysis. Chapter 2 addresses this broader question.

[18] I found that from the sampled 821 parent firms with investment scale (subsidiary equity to firm assets ratio) data, 124 are suppliers belonging to a keiretsu with investments largely overlapping with those of their keiretsu-related clients (total 41 client firms). Due to the established long-term relationships within such groups it can be argued that these 124 suppliers will tend to have higher scope and intensity levels than non-affiliated parents. In order to test this proposition I included a dummy for these 124 suppliers in the regression of scope on firm resources. The coefficient is 0.27 (S.E. 0.19) with p-value of 0.16.

Chapter 2: Location Advantages

2.1. Introduction[19]

This chapter studies the effect that countries - hosts of multinational enterprise (MNE) investments - exert on MNE network patterns. The major assumption in this chapter is that, apart from being just locations with different levels of endowments as location theory suggests, host countries are active participants in the process of inbound foreign investment and influence investor strategic decisions. The extent of this influence is determined by the respective host country bargaining power, which is, in short, based on its endowments and the availability of switching option to the MNE. The location influence is also determined passively by host culture. The effects of these location variables have been studied extensively in samples that include both developing countries and developed countries as hosts (Makino and Neupert, 2000; Mortimore, 2000; Agarwal and Ramaswami, 1992). While location variables certainly influence market selection and therefore MNE network scope and intensity (Andersen, 1997), their effect is most important with respect to the daily operation of the subsidiary. Therefore it is necessary to study other network features that are more likely to reveal this close influence. Entry mode for each subsidiary is probably the most important characteristics in this respect.

Entry mode expresses the means of internationalization of the firm and is one of the most essential features of MNE activity. The entry mode determines the MNE level of

[19] The main arguments of this chapter follow closely Somlev and Hoshino (2005).

exposure to, and use of, local assets and management and is likely to reflect their influence on the daily operations of MNE subsidiaries. Many scholars point out that this level of exposure influences profitability and stability of operations (Beamish et al., 1997; Nitsch et al., 1996; Woodcock et al., 1994; Chen and Hu, 2002). For this reason entry mode is extensively analyzed in different contexts, by assessing the effect of the factors that determine the investment process: firm-specific capabilities, internalization and location. The first two factors are manifestation of MNE competence and strategy that make the subsidiaries with a common parent similar in design as part of a broader network pattern already analyzed in Chapter 1. On the other hand, location factors presumably shape the entry mode choice as much as MNE capabilities do, because the necessity to adapt to different host realities makes MNE subsidiaries less similar in practice. However, while there are many studies about the effect on entry mode of the first two groups of factors, the methodology for reflecting the location effect is barely developed in studies of MNE activity (Dunning, 1998).

Some authors control loosely, rather than analyze, the location factors through the (single-host) designs of their entry mode studies or through implicit assumptions, despite the fact that some location factors are indispensable in any research of entry mode. The best example of such a factor is government restriction on foreign ownership (Chen and Hu, 2002). More focused studies incorporate explicitly the relevant political hazards and government restriction by reflecting highly variant institutional environments, often of developing countries (Padmanabhan and Cho, 1996; Delios and Henisz, 2000). These studies of political factors contribute to our understanding of some of the location influences and suggest that country risk is an appropriate variable for differentiating the locations in MNE networks and that it is approximated by the

development of host economic and political institutions. However, it is also necessary to analyze how other types of location factors influence entry mode. Given the theoretical importance of all types of location factors I attempt to isolate their effect on 751 entries of 405 Japanese MNEs in Europe. The reason to choose Europe as the focal point of the analysis is that it is a case where political restriction plays a minimal role and location variation comes primarily from non-political factors. European countries are ideal in this respect because their policy to investors is integrated and common, while important differences in local factors remain. The following analysis is based on subsidiaries in manufacturing industries because these entries of higher commitment depend most on local conditions, and have been frequently used in previous studies (Heitger and Stehn, 1990; Padmanabhan and Cho, 1996; Belderbos et al., 2001).

2.2. Explanatory factors for entry mode choice

Forms of international expansion like exporting and licensing are modes of low commitment that do not constitute foreign direct investment (FDI), and are beyond the scope of this study. The studies of modes of higher commitment have followed different approaches. Hennart and Reddy (1997) divide entry mode to local asset seeking and wholly owned modes and focus on the former one, which corresponds to acquisitions and joint ventures. Other scholars incorporate all relevant modes by using two *separate* variables for ownership structure and mode of establishment (Padmanabhan and Cho, 1996). The following analysis integrates both ownership structure and mode of establishment in one multinomial dependent variable, which includes greenfield investment, acquisition, and joint venture, in approximate order of gradation of MNE

subsidiary exposure to local participation in assets and management. Few studies use such an integrated approach (Chang and Rosenzweig, 2001).

2.2.1. Existing theory on FDI entry mode choice

The explanations of FDI entry modes as starting point of FDI activity have been given mainly from MNE perspective and refer to MNE experience, proprietary assets and technology, cost saving reasoning, and learning. Padmanabhan and Cho (1996) confirmed that entry modes depend on investor's experience and found shared ownership modes more likely at the early phases of involvement in a foreign country, whereas wholly owned greenfield entries occur after experience is accumulated. Other scholars theorized that it is the failure of the market for technology goods that explains FDI entry modes (Casson, 1995; Dunning, 1988; Caves, 1996). The proprietary asset hypothesis developed by Caves (1996) considers joint ventures and acquisitions as inferior choices for technologically intensive parents because of the respective difficulty to devise informed contracts and to separate the human factor from the technology one (Caves, 1996; Williamson, 1985). Furthermore, there is a view within the resource-based approach that although the MNE initially relies on its superior capabilities and greenfield entries to overcome the liability of foreignness, it will eventually try to secure key resources and knowledge residing in local firms (Chang and Rosenzweig, 2001; Delios and Beamish, 1999). In the case of such asset-seeking FDI (Dunning, 1998), which is often concurrent with parent diversification into new lines of business, acquisitions and joint ventures will be preferred to greenfield entries.

The most widely used FDI theory is the transaction cost framework (Coase, 1937; Williamson, 1985). In fact resource-based explanations are used as complementary to

the logic of the transaction cost theory (Andersen, 1997; Delios and Beamish, 1999). According to the latter FDI occurs when there are high costs associated with the use of the market as a medium for structuring the economic transactions. It predicts that internalization of business activity is more likely to occur when asset specificity, environment uncertainty, and frequency are features of (overseas) transactions, because these features increase the costs of using the market (Williamson, 1985). Assuming that the concepts of control and integration are closely related, the empirical research has taken this postulate of the theory to mean preference for greenfield entries to joint ventures when transaction costs are high (Andersen, 1997); although joint ventures are also hierarchical organizations preferable to arm's length market transactions.

A recent theoretical development in entry mode theory is the behavioral perspective, which treats entry choice as a dynamic decision-making process grounded in MNE learning abilities (Chang and Rosenzweig, 2001; Vermeulen and Barkema, 2002). This approach recognizes explicitly that FDI is a sequential process in which learning facilitates entries in already practiced modes. For example, Chang and Rosenzweig (2001) found an empirical support for the claim that MNE experience with joint venture and acquisition modes is likely to promote further entries through the same modes.

2.2.2. Location factors and entry mode choice

Experience, capabilities, assets, learning and transaction costs are factors within the sphere of MNE control and strategic decision-making. However, internationalization and entry mode choice depend critically on the sphere of host sovereignty, within which the MNEs have little control. The bargaining power model is a suitable framework to analyze this MNE – host interaction, because it rests on the same assumptions as

transaction cost theory – bounded rationality and opportunistic behavior – and in fact has been integrated with the transaction cost framework in previous studies (Padmanabhan and Cho, 1996; Gomes-Casseres, 1990). However, most of these studies are focused either on ownership restrictions limiting the investors' choices of entry mode, or on similarly limiting country-risk factors (Padmanabhan and Cho, 1996; Delios and Henisz, 2000). The aim in the present context is to study the effect of location factors on entry mode choice in a context with no ownership restrictions or expropriation hazards, in order to gain further insights in the interaction between MNE strategy and host country factors. Some studies show that the bargaining power approach is applicable even to such an extended agenda (Oman, 2000).

According to the bargaining power model when MNEs plan an entry into a labor endowed country and face host government restrictions or other unfavorable conditions, they are in a relatively stronger bargaining position because they can shift to another labor endowed location where greenfield investments are not obstructed. In addition, host governments have incentives to attract such efficiency-seeking FDI because the latter promotes growth in exports (Moon and Lado, 2000, p.96) and employment. Therefore, it is likely that potential hosts will allow greenfield investments and will even provide additional incentives to investors in order to compete with rival host destinations (Oman, 2000). On the other hand, MNEs that aim at production and sales for the host market are in a weaker bargaining position with respect to the host government because they do not have a switching option and their investment is likely to increase competition in the host country and threaten domestic business interests (Moon and Lado, 2000, p.98). In this context host governments are likely to be concerned with technology spillovers and provide incentives for shared ownership

modes. Even without enacted ownership restrictions, MNEs will prefer joint venture or acquisition modes in order to gain access to local distribution networks and meet better the customers' needs. However, this tendency is mitigated by host market growth, because MNEs prefer not to share the benefits of high growth with a partner and therefore choose greenfield, or acquisition (Hennart and Reddy, 1997), entries.

In summary, the MNE motivation for investing in a particular country determines its relative bargaining power with respect to the host and this power balance influences the mode of entry. Sizeable markets are likely to promote joint ventures or acquisitions, while low labor costs promote new wholly owned investments focused on operational efficiency in labor-intensive production for export to other countries. The latter choice is reconfirmed in the case of Japanese MNEs by the accepted opinion that the competitive advantage of Japanese producers arises from lean production methods (Takamiya and Thurley, 1985) and such production organization will avoid local interference via wholly owned greenfield modes of entry[20] (Morgan et al., 2002).

In addition to market size and growth and labor endowment, culture is another location-related variable often used in explaining entry mode choice (Chang and Rosenzweig, 2001; Kogut and Singh, 1988). Differences in culture between home and host countries hinder post-acquisition integration and often necessitate partnership with local firms for acquiring complementary knowledge for working in the new environment (Kogut and Singh, 1988). However, cultural distance may also increase the cost of assimilating equity partners when operating a joint venture (Padmanabhan and Cho, 1996). Other authors find that, independently from cultural differences, investing firm's country of origin is associated with preference for a particular mode, such as the

[20] For example, this mode has been preferred in the UK to acquisitions in order to avoid the negative effect of pre-existing multi-union arrangements (Takamiya and Thurley, 1985).

tendency Japanese MNEs have to avoid acquisitions (Chang and Rosenzweig, 2001). Although these empirical studies have consistently relied on the cultural indices developed by Hofstede (1980), there is still a controversy about the exact effect of culture on entry mode.

2.2.3. Hypotheses

The different investment locations in Europe are aggregations of versatile location variables. These include market size and growth, labor cost and productivity levels, cultural and language proximity to the investing countries, abundance of other production factors besides labor, privatization policy, strength of local competitors, and degree of positive host government attitudes and policies towards FDI. I assume that ownership restrictions play a minimal role in Europe, including Central and Eastern Europe (CEE) where most investments followed the period of liberalization, and focus on the remaining location variables.

Expressed in terms of the prescriptions of the bargaining power model, the European countries are in a stronger position to protect their sizeable markets against market-seeking investors. A major element in their approach is that they accomplish this task with a *common* set of (local content and other) rules. The fulfillment of these rules guarantees equal access to each country's market to the disadvantaged investor (Deutsch, 1999; Morgan et al., 2002; Belderbos et al., 2001). Owing to this regional relevance of the rules and the geographical proximity of the countries, the differentiation of locations according to market size or accessibility to local distribution channels is less important for the investors (Blanpain and Hanami, 1993). However, the foreign investors clearly differentiate the countries and the entries to each location on the basis of availability and

costs of factors of production (Strange, 1993). On this basis the bargaining power shifts to the investors and the potential host governments become rivals for FDI. In locations with abundant and less costly labor, government support for FDI is likely to exist and the choice of greenfield entry is likely to prevail. To sum up, the MNEs are in a stronger bargaining position to seek efficient production organization by greenfield entries in countries with lower labor costs than the average for Europe.

Hypothesis 2.1. *The lower the labor costs, the more likely MNEs' choice of wholly owned greenfield mode of entry rather than joint venture or full acquisition.*

Although common rules of origin and trade policy apply for foreign MNEs, individual European countries have consistently interfered in the negotiation between the Commission and the Japanese MNEs (Deutsch, 1999). The bargaining power model predicts that countries with sizeable markets are willing and able to require from foreign investors shared ownership entry modes, which mitigate the competitive threat to local producers. Although the commitment of EU countries to make a common policy often leads to weakening the individual country bargaining position (Deutsch, 1999), I expect that the influence of countries with sizeable markets on entry mode will persist.

Hypothesis 2.2. *The bigger the market of the host country, the more likely MNEs' choice of joint venture rather than wholly owned greenfield modes.*

The extent to which other factors of production besides labor are organized within local firms also affects the balance of host-MNE bargaining power with respect to entry mode decisions. The usual claim that foreign investment enhances the efficient use of host assets holds more for less developed host countries than for ones where strong local firms compete in using the existing productive factors (Lane, 1995: Chapter 5). In

the former case the MNEs have clear advantage over promoting development hosts. In addition, in these host countries there are fewer advanced local firms with the specific assets sought by MNEs in joint ventures or acquisitions. The latter case of strong host competitiveness and productivity represents the opposite, where local interests and capabilities are likely to influence a MNE entry with joint venture or acquisition for accessing the local assets. I suppose that host competitiveness in a given industry is likely to attract MNEs to acquire local assets or create joint ventures with local partners.

Hypothesis 2.3. *The more competitive the host country, the more likely MNEs' choice of joint venture or full acquisition rather than wholly owned greenfield mode.*

There is ambivalence with respect to the hypothesized effect of cultural difference on entry mode. Some authors find it related to greenfield entries (Padmanabhan and Cho, 1996) while others find it related to joint ventures (Brouthers and Brouthers, 2001; Hennart and Larimo, 1998). In addition, although most authors combine the Hofstede cultural indices into a composite index of cultural distance between investor and host countries (Kogut and Singh, 1988; Chang and Rosenzweig, 2001), it is possible to have one of the dimensions of culture more relevant than the others with respect to entry mode choice. In the present single investor country design, cultural distance arises from differences in host cultures only; therefore, I decided to build a non-directional hypothesis. I follow a classification by Ronen and Shenkar (1985) to label the different cultural types in Europe. The types relevant to the present sample are: Nordic and Germanic (Sweden, Finland, Denmark, Netherlands, Germany, Austria and Switzerland), Anglo (UK and Ireland), and Latin European (Belgium, France, Italy, Spain and Portugal), while CEE is not included. I accept the theoretical claim that different culture

leads to different organization style and hypothesize that culture influences entry mode differently for each type in the sample. If such (non-zero) differences emerge I will further try to pinpoint the index they stem from.

Hypothesis 2.4. *MNE choice of entry mode differs significantly across the cultural types present in Europe.*

Previous research has found that MNEs prefer acquisitions most when the industry entered grows either very fast or very slowly, because this entry mode permits faster entry in the former and does not add profit depressing capacity in the latter case (Hennart and Reddy, 1997). However, MNEs are likely to prefer also wholly owned greenfield modes when the industry entered grows very fast, in order to avoid sharing of guaranteed profits with a local partner.

Hypothesis 2.5. *The higher the industry growth, the more likely MNEs' choice of wholly owned greenfield mode of entry or full acquisition rather than joint venture.*

2.2.4. Controls

As discussed previously, there are three broad groups of explanatory factors for entry mode – experience/capabilities, internalization, and location (Andersen, 1997; Casson, 1995; Williamson, 1985; Dunning, 1988). Controls for capability and internalization are necessary for finding the real effect of location on entry mode in the present non-random sample. I include the most important forms of experience and capabilities - international, industrial and host experiences (Delios and Henisz, 2000) – as three major controls in the present study. The former two express MNE technological and marketing advancement and are likely to be positively related to wholly owned greenfields.

Diversification entries in new industries represent the extreme case of low industrial experience and are likely to occur through joint ventures or acquisitions.

On other hand, host experience helps MNEs overcome the liability of foreignness and is likely to be positively associated with joint venture and acquisition modes. However, empirical results about foreign experience effect on entry mode are controversial (Harzing, 2002). Song (2002) distinguishes between MNEs that passively absorb knowledge during a prolonged foreign presence and MNEs that actively develop location-bound competence in the invested host country. The latter parent firms are not only likely to upgrade their activities in the host, but also to employ a broader range of local procuring (Song, 2002). In this case experience leads to decreased transaction costs and subsequent entry is likely to be acquisition of, or cooperation with, a local entity, which is not necessarily true for MNEs whose presence in a location is supported mainly by headquarter-level capabilities and employs little location-bound competence. Harzing (2002) defines the latter strategy as global and the former as multidomestic and finds that MNEs pursuing multidomestic strategy are more likely to enter with acquisition than MNEs pursuing a global one. Experience is likely to lead to acquisition in subsequent entries of MNEs pursuing multidomestic strategy.

Subsidiary age is another important control for time effects in this cross-sectional study, as previous findings suggest that the Japanese MNEs increase their ownership level with time (Mansour and Hoshino, 2002; Beamish et al., 1997). In addition, industry controls are included. The final (sixth) control is subsidiary parent profile. Although all parent firms have their main activity in some manufacturing industry they may invest in a subsidiary together with a general trading company (Sogo Shosha) or with another Japanese manufacturing firm. Most of the sampled subsidiaries have only

one investing parent from Japan; therefore it is inapplicable to investigate in detail the influence of Sogo Shosha or other Japanese partners on the entry mode with the present design. Nevertheless, a dummy is introduced to reflect the positive effect an additional partner of a larger size and extended international experience has on the choice of wholly owned entry mode.

2.3. Research design

The sample of Japanese subsidiaries in Europe is drawn from the 2003 Japanese-language edition of *Kaigai Shinshutsu Kigyou Souran* (Japanese overseas investments), compiled by Toyo Keizai Inc. by means of surveys of all major Japanese companies (with a response rate of about 60%). The database provides basic features of respondents' subsidiaries in the world like place and year of investment, capital, employees, and reasons for investment. The total registered European manufacturing subsidiaries in the database that belong to manufacturing ultimate parents, and are established prior to the end of 2001, comprise the initial sample of 766 firms, which was reduced, after deletion of 15 cases of firms without data on ownership structure, to 751 subsidiaries, owned by 405 Japanese parents. Most of these parents have commercial subsidiaries as well. Descriptive statistics for parent firms are listed in Table 2.1. The country distribution of subsidiaries is given in Table 2.2. The countries in Europe are grouped in seven sub-regions by geography and economic integration, but primarily by their cultural type (Ronen and Shenkar, 1985). While Nordic countries are grouped with Germanic ones because of their cultural similarity and the small sample size of the former, Latin European countries are split to smaller units because the sample size

allows it. I do not expect significant differences in entry mode between these units that reflect the same culture pattern. Thus, the location dummy categories are "UK-Ireland", "France", "Belgium", "Spain-Portugal", "Italy-Greece", "CEE", and the base one "Germany-Netherlands-Sweden" (Table 2.2).

Labor cost data is calculated from the ratio of two variables in the OECD STAN database for each year, country and industry (OECD, 1994; 1995; 2004a): "wages" divided to "number engaged"[21]. I divide this ratio to the average ratio by country, for each year and industry. This "relative to the average" measurement reflects country differences but not differences in the nominal value of money between the years.

I measure market size of a country by its relative (to OECD 15) value added shares in each year and industry (OECD, 2004b)[22]. This measurement of production shows the relative scale of domestic business activity, and reflects the difference in the respective market scales. It is valid because it correlates highly with "potential" and "realized" market size[23]. However, market size turns out to have non-linear effect on entry mode. It is therefore introduced as a factor variable with three categories, each including equal number of cases. Medium market size is one with relative value added share between 5 (inclusive) and 7, large size is one with relative share more than or equal to 7, and small size refers to shares below 5. Medium size is set as a reference category.

Host competitiveness equals the ratio of R&D intensity of firms in a given country to

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[21] The former comprises of wages and salaries of employees as well as supplements such as contributions to social security, private pensions, health insurance, life insurance and similar schemes (in US dollars), paid by producers; while the latter comprises of both full and part time employees (OECD, 2004a).

[22] Value added (current prices) is measured at factor costs plus other taxes less subsidies, on labor and capital employed (OECD, 2004b). Value added shares measure for *each industry* and year the proportion of a country GDP to the sum of GDPs of a group of 15 OECD countries, which allows comparison between years (nominal values cancel out) and countries (the same denominator as basis).

[23] The ratio of the *total* (not just that of an industry as in the present measurement) GDP of a country to the sum of other country total GDPs measures the general purchasing power of its customers and hence its potential size for any industry. Sales volumes at the domestic market (approximated by value added minus exports plus imports for each industry) give the realized market size.

the average R&D intensity of firms in Europe, calculated separately for each industry and year. This averaging out is necessary because of the R&D-intense nature of some industries. Hypothesis 3 refers to country differences not differences in industrial R&D levels. R&D intensity has often been used in previous research as a measurement of firm capabilities. Firm R&D intensity data by country, year and industry, are calculated in the OECD STAN indicators database (OECD, 2004b) as a ratio of business enterprise research and development to production, both in current prices. Like market size, this variable, when split to three categories of equal size, has non-linear effect on entry mode with the effect of middle and low values not different from each other but different from high values. Therefore, I introduce a dummy for values above 1.25.

Industry growth is based on industry growth averages for the three years prior to investment in a given industry and country, where growth is calculated as change in volume produced (OECD, 2004a). Due to high correlations between country averages for each industry as well as missing values for some of the countries, the final measurement is an average of the major country (France, UK, Germany, and Italy) growth. I assume that the possibility of unimpeded intra-EU exports[24] is the factor behind intra-industry growth equalization on the host level and set this variable to reflect inter-industry growth differences on EU level.

As for the controls, the theory of FDI existence postulates that the number of subsidiaries (for a given industry) each MNE has in the world is a sign of the MNE intangible assets (Caves, 1996) and reflects the MNE technological advancement. Therefore, the number of subsidiaries of each MNE in the world measures its industrial

[24] Although the CEE countries included in this study (mainly Poland, Hungary, and the Czech Republic) were not part of the common market in the sampled period, their associated country status gained early in the liberalization period gives enough credibility to consider them as such a part.

experience as a function of its intangible resources. The number of countries each parent has invested in, irrespective of industry, measures MNE international experience[25].

Subsequent entry is a dummy, which equals 1 when a MNE has previous entry in the host. "Time trend" is the year of investment. I find that its effect on entry mode is not linear and introduce three categories - 1969-1986, 1987-1992, and 1993-2002 - with the second being the reference one. The dummy "Second parent" is set to "1" for subsidiaries whose main (manufacturing) parent is supported by Sogo Shosha or by another Japanese partner of bigger size. Finally, a dummy used for industry analysis is divided to eight categories, following Toyo Keizai Inc. (2003). The category "Resource-based" takes value of 1 for activity in wood processing, paper, leather, stone and clay, iron and other metal processing, and metal goods. The other categories are "Traditional" (mainly food and textiles), "Construction", "Chemicals", "Machinery", "Electronics", "Pharmaceutics", and "Automobiles". Table 2.3 summarizes the variable design and measurements.

All entry modes are described at the time of commencing *manufacturing* activity. I apply the standard definition of joint ventures (and partial acquisition) as greenfield investments (and acquisition) with more than 5% participation of a local, non-Japanese firm in equity. Beside 133 full acquisitions and 389 wholly owned greenfield entries, the sample contains 229 joint ventures, of which 16 cases are partial acquisitions and 57 cases are "capital participations in existing European enterprises" (Toyo Keizai Inc., 2003). Although not greenfield ventures, these combined 73 cases of subsidiaries of

[25] The country and subsidiary number variables are correlated (r=0.6 when the former is in log form), which makes difficult to estimate their separate effects. The log form of the former is almost perfectly related to the number of continents (NC), where MNE invests (r=0.9). I found that the effect of NC on entry mode is not linear, with the smallest category (=1) accounting for most of the variation. Therefore, I include it, in place of country number, as a dummy variable measuring international standing.

local and foreign parents are similar in structure to joint ventures. As stated above, I consider all relevant modes in the order of gradation of MNE exposure to local participation in assets and management. While in full acquisitions the MNEs challenge is the existing corporate climate, in the last 73 cases of mostly capital participations, MNE challenge is to make shared decisions over assets and management with a local partner. The MNEs face the same challenge in greenfield joint ventures. Previous studies considered capital participations as a subset of international joint ventures (Chen and Hennart, 2004). Therefore, these 73 cases of capital participation and the 156 cases of greenfield joint ventures form one category called "joint ventures". A multinomial logistic model is constructed, in which the dependent variable has three non-ordinal categories: wholly owned greenfield, full acquisition and joint venture. I set all coefficients of the first mode to zero, making it a reference option. The model calculates the relative probability of choice compared to the reference option (McGullagh and Nelder, 1989; Hosmer and Lemeshow, 2000). The exponential of a coefficient for the respective choice (full acquisition or joint venture) is referred to as the relative risk, or the ratio of the probability of choosing this mode to the probability of choosing the reference mode, for a unit change in the independent variable corresponding to that coefficient. Tables 2.4 and 2.5 present variable statistics and correlations.

2.4. Results

Although only results based on raw data are reported, I confirmed these results with analysis of grouped data as well, because the latter has better asymptotic properties and deals successfully with outliers. I confirmed the coefficient values and statistical

significance by using two statistical packages (SPSS 11.0 and S-plus) and analyzing the three binary choices with separate binary logistic regressions. The reported results are for the categories of joint ventures (including capital participations) and full acquisitions and do not change largely if capital participations are excluded from the former. Thus, the following discussion about joint venture is valid for *greenfield* joint venture as well.

Table 2.6 presents results only for the best model. Selection of the best model requires likelihood ratio tests for inclusion of each variable, with main explanatory ones preferably included last (Collett, 2003). It also requires checking the linearity assumption and variable interactions. While the latter check showed no significant interactions for inclusion, the former showed that time, market size, host competitiveness and international inexperience effects are not linear; therefore I included them as factor variables. Likelihood test ratios also revealed that from all industries automobiles and chemicals have strong effects on entry mode, while differentiation of any of the rest does not contribute to the deviance and I depict them as a common base category.

The results reported in Table 2.6 show that, contrary to hypothesis 2.1, lower labor costs are not significantly associated (deviance of 1.59) with wholly owned greenfield entries although the signs are correct. Hypothesis 2.2 is not supported as well, because the correct sign of Market size (small) is not significant, while Market size (large) is not at all different from the medium category. In fact the results show (when acquisition is reference category) that full acquisition mode is preferred to joint ventures as well, in both small and large markets. The correct signs and moderate significance of the host competitiveness coefficients support hypothesis 2.3. There is strong empirical support for Hypothesis 2.5 because MNEs clearly prefer wholly owned greenfield entries rather

than any other option when entering in growing industries. Finally, there are marked differences in the preferred entry mode across cultural types as Hypothesis 2.4 predicts. MNE parents are less likely to choose joint ventures in UK/Ireland than in the other regions, more likely to enter with wholly owned mode in Belgium/Luxemburg, and more likely to choose joint ventures in France and joint ventures and acquisitions in Spain/Portugal and Italy/Greece, the effect being stronger in the latter two regions[26]. Most Latin European (Ronen and Shenkar, 1985) countries have similar effect on entry decisions except Belgium, which diverges from the countries in the cluster towards the wholly owned choice option (Figure 2.1).

From the control variables, "Subsidiary number" is positively and significantly related to the greenfield mode, as expected. Entries of industrially inexperienced parents and diversification of experienced parents, both with low "subsidiary number", are associated with joint ventures and acquisitions. "International inexperience" shows that parents who invest only in Europe at the time of entry are more likely to prefer full acquisitions to other modes than more geographically diversified parents. Subsequent entries are less likely to be wholly owned greenfield than initial ones, as expected. However, if previous production experience (what the subsequent entry variable reflects) is replaced with a dummy that reflects previous production *or* sales FDI experience in the host, the results for the new experiential learning variable are not significant. This shows that the type of involvement in the host determines the extent of MNE learning.

Subsidiaries with second Japanese parent are seldom result of acquisition entries. The

[26] I reached these conclusions after confirming significance of country coefficients for different base categories for the dependent and country dummy variables. Results are shown in Table 2.7 and summarized in Figure 2.1.

coefficients of the two variables that measure time trend show that acquisitions were avoided before 1986, but increased significantly since then. The Japanese MNEs preferred acquisition and to lesser extent joint venture entries in the period from 1987 to 1992, probably due to the easy credit conditions in Japan during that time. Finally, the industry controls show a strong relationship between automobiles and joint ventures. Parents in this industry systematically prefer joint ventures to any other entry mode. "Automobiles" contributes a major share to the explanatory power of the model. The Europeans attach high importance to this industry and tend to take a defensive stand towards competitive threats from Japan (Deutsch, 1999). This explains the desire of the Japanese MNEs to legitimize their market activity through forging links with European firms in this industry. This effect is similar to investment restriction of the type I ruled out at the beginning of the analysis. None of the other industries have such clear-cut effect on entry mode; therefore it is best to pool them together as a reference category[27].

2.5. Discussion

There are two ways of reasoning the labor cost effect on entry mode. One is the bargaining power approach, used to build hypothesis 2.1, which emphasizes the MNE desire for and power to obtain operational independence in cost-efficient locations. It explains a general preference for wholly owned greenfield entries in such locations. The other is related to hypothesis 2.3, emphasizing the asset-seeking motivation in

[27] I reached these conclusions after repeating the analysis with different base categories for the industry dummy. I wanted to show that the effects of labor cost, host competitiveness and industry growth are not spuriously derived from the significant influence of some industry on entry mode. This test is necessary because of the relatively high correlations between these variables and various industries (Table 2.5). "Chemicals" was the only industry except automobiles to decrease significantly the deviance by its negative effect on non-greenfield entries. Therefore its effect is showed in the model.

competitive locations where labor costs are usually higher, as the positive correlation between labor cost and host competitiveness shows (Table 2.5). It explains a preference for acquisitions in locations with higher labor cost. Therefore, it is necessary to include both cost and competitiveness variables in the model. If host competitiveness variable is omitted from the model, labor costs become significantly (and spuriously) associated with full acquisitions and capital participations relative to greenfield joint ventures (p-value=0.09) and to wholly owned entries (p=0.01). With host competitiveness included, the labor cost association with non-greenfield modes weakens (p-values equal 0.26 and 0.12 respectively). Host competitiveness, on the other hand, reveals preference for full acquisitions and avoidance of wholly owned greenfields (with joint ventures choice in between) in highly competitive locations, which supports hypothesis 2.3. Thus both labor cost and local competitiveness variables show the expected influence on entry mode, although with weak significance in the former and moderate significance in the latter case.

Contrary to hypothesis 2.2 prediction, joint ventures and wholly owned modes do not occur in large versus small markets respectively. This suggests that the compromise European countries make, in order to maintain a common stance towards foreign investors, is not secondary to their individual bargaining positions as I supposed, but replaces their leverage entirely. Surprisingly, the significant effect of market size on entry is analogous to the effect low and high growth have, according to some authors: MNEs prefer acquisitions, because this mode does not add profit depressing capacity in the former and permits faster entry in the latter case (Hennart and Reddy, 1997). The results support strongly the small market size influence on acquisitions. The effect of large market size is similar but less significant (p-value of about 0.14 relative to joint

ventures as well as to wholly owned modes). More light is shed on this peculiar relationship in the discussion of acquisition mode profile below. The association between high industry growth and wholly owned greenfield modes supports hypothesis 2.5 and shows that Japanese MNEs in Europe behave differently from the ones in US, where high growth is related with acquisitions (Hennart and Reddy, 1997).

I assumed that cultural differences stand behind any remaining location influence on entry mode and introduced a dummy for regions (hypothesis 2.4). However, a dummy may reflect any other relevant country difference besides culture. I discuss first the culture hypothesis and then other rationalizations of the country dummy effect. Figure 2.1 shows that the differences among Latin European, Anglo, and Germanic cultural types are greater than the differences within them. Only Belgium is exception.

The literature on entry mode refers frequently to four cultural dimensions supposedly affecting entry decisions: power distance, uncertainty avoidance, individualism and masculinity (Brouthers and Brouthers, 2001; Chang and Rosenzweig, 2001; Hennart and Larimo, 1998; Kogut and Singh, 1988; Padmanabhan and Cho, 1996). The latter two express differences in work goals and have significant consequences for personnel management (Hofstede 1980). Japanese subsidiaries in Europe tend to employ local managers to carry out personnel policies congruent with host values (Blanpain and Hanami, 1993). Takamiya and Thurley (1985) find the source of competitiveness of the Japanese transplants in the UK not in Japanese-style personnel policies but in organizational factors like production process management. Therefore I claim that it is the power distance dimension that accounts for differences in organizational structures

across the locations in the present sample[28].

Power distance is related conceptually to concentration of authority in organizations and affects directly the number of hierarchical levels and management personnel (Hofstede, 1980: p. 134). The greater need for management personnel in subsidiaries in high power distance countries and the limited labor market for such positions are likely to *cause* MNE entry by joint ventures (or acquisitions) that utilize the management resources of existing local firms. Respect for rules and authority in such countries also *facilitates* the control of these shared-ownership ventures. Therefore, countries with high power distance scores (France, Belgium, Portugal, Greece, Spain, and Italy) would tend to have more joint ventures than countries with low scores (Netherlands, Germany, UK, Switzerland, Sweden, Ireland, Denmark, and Austria), which is empirically confirmed for the present sample except for Belgium (Figure 2.1).

There may be other explanations of the country dummy effect. For example, the positive effect of "Automobiles" on joint ventures and capital participation suggests that although open restriction to investment does not exist in Europe, there are marked differences in attitude about how to face strong foreign competition. Deutsch (1999), for example, divides the European countries according to their policy preferences with regards to foreign trade issues in two groups, free traders and protectionists. Germany, the Netherlands and Denmark belong to the first group, with the United Kingdom considered also a part of it. France, Greece, Italy, Ireland and Portugal belong to the second group, with Belgium and Spain also generally treated as a part of it (Deutsch,

[28] The fourth - uncertainty avoidance – dimension is strongly positively correlated with power distance, and this correlation coefficient is close to one for the present sample (Hofstede, 1980). Only Austria deviates from this relationship because of its extremely low power distance index. In addition uncertainty avoidance reflects both cultural and *personality* traits (Hofstede, 1980: pp.161-163), which makes it a weak predictor of organizational structure.

1999: p. 43). It is clear from Figure 2.1 that the country clusters generally fit this "policy preference" rationalization, with the latter countries (protectionists) having an effect on entry mode similar to that of "Automobiles". Belgium again is a major exception.

One political consequence of power distance is that high power distance countries often revert to political force and oppression to maintain their position in the face of foreign threat (Hofstede, 1980). Therefore, the cultural and political explanations are the two sides of the same power concentration factor; with the former focused more on subsidiary internal organization and the latter on its external legitimacy. The deviation of Belgium may be explained with its central position, the existence of two different subcultures, and the concentration of Japanese investment in the northern part of the country. In fact, the major reasons for investing in this country - "physical distribution" and "availability of English speaking managers" – coincide with the reasons of investing in the Netherlands (Blanpain and Hanami, 1993).

Finally, I repeated the analysis adding subsidiary size in terms of employee number as explanatory variable[29]. It is significantly positively associated with acquisitions. Thus the profile of full acquisition entries is large subsidiaries, in highly competitive locations, in low growth industries, in small and big size markets, created after 1986 by parents of low industrial experience, focused only on Europe, entering alone. This contrasts with a joint ventures profile where subsidiaries are smaller, in medium size markets, in Southern Europe, effected with possible Sogo Shosha cooperation by parents of high international experience, often in automobile industries. It contrasts also

[29] Due to missing employee data the sample size decreases to 570. I do not show a separate table of results because the remaining variables do not diverge from the values reported in Table 2.6. In addition, subsidiary size is only a suggesting variable for acquisition entry features and has no theoretical meaning.

with a wholly owned greenfield mode profile of low competitiveness, high growth, average market size, Northern European location, not in subsequent entry, and by internationally and industrially advanced parents (Table 2.8).

The combination of factors in the wholly owned and joint venture mode profiles represents anticipated and well-confirmed influences on these entry modes. The former combination of exploiting existing profit opportunities in less power-concentrated countries by capable MNEs suggests wholly owned modes, while the latter one of low growth, medium size markets in power-concentrated countries by less capable parents necessitates joint ventures. On the opposite, the combination of factors in the acquisition mode profile seems to be inherently unstable. Who are these less advanced parents starting their initial and only (at time of entry) expansion abroad with such extensive and costly investments in low growth industries and small (but to some extent also large) markets populated with competitive local firms?

It is likely that these acquisition parents are specialized supplier firms that have followed their main customers' investments abroad and the unaccounted factor is again a location one: the presence of keiretsu-related major Japanese MNEs in the host. However, these acquisition parents may also be narrowly specialized asset-seeking firms, strategically focused on the European market.

2.6. Conclusions and limitations

This chapter investigates the effects of location and location-related factors on establishment and ownership decisions of the Japanese multinationals in Europe. Its aim is to find other location variables, beside the political risk factor, or the distinction of the

countries to developed and developing, that shape the operation of subsidiaries in MNE networks. It shows that location factors influence significantly entry mode in a model that includes explicitly the strategic context of subsidiary creation like parent capability and experience, presence of second Japanese partner, timing, and industry. Three hypotheses were empirically supported with a sample of 751 manufacturing subsidiaries. The results show that low host competitiveness, Northern European countries, and high industry growth are related to wholly owned greenfield mode of entry. On the other hand Southern European countries are associated with joint ventures, high competitiveness with full acquisitions, and low growth with both. From these three location variables the distinction North-South, which is based on cultural difference, has the strongest effect on MNE subsidiaries. These findings show also that MNEs choose locations that best fit their strategy and suggest that host factors influence host selection besides entry mode.

The analysis has several major limitations, related to its validity and scope. First, inclusion of keiretsu relationship will shed more light on the market size effect on entry mode. Second, the scope of conclusions is limited to the context of the sampled countries of investment origin and destination. The results are conditional on the assumption that there are no major political or social risks and no ownership or other restrictions imposed upon investors. Finally, investors from a different home country may respond differently to identical location factors (Tatoglu and Glaister, 1998). A more general study of location effect on entry mode has to incorporate all these concerns.

Chapter 3: Performance

3.1. Introduction

The previous two chapters have defined several major variables for inclusion in the following analysis of profitability. From the network features of Japanese multinational enterprises (MNEs) those of scope, intensity and presence in China appear to be the most relevant, as well as some of the principal components depicting network location pattern in Table 1.11. For example, the third principal component (pc) overlaps somewhat with the "presence in China" dimension and may serve as an alternative measurement of this dimension. Timing of first investment in the world, as well as firm size, are also important controls that influence the different stages reached by MNEs of evolving growth. From the location factors that influence MNE networks, the cultural difference factor was found to have the strongest relevance, followed by industry growth levels. It is necessary to include also country political and macroeconomic factors. I claim that all of the above factors influence MNE network performance and therefore should be included in models that test the effect of ownership and location factors on firm results.

The study of profitability has been notoriously difficult because of the wide range of factors affecting profits and the difficulty to obtain data for financial results. The former difficulty refers to factors that, unlike the endogenous factors of the model like entry mode choice, ownership advantages and network patterns, are more exogenous in nature and affect the performance in hardly predictable ways (Nitsch et al., 1996). Real

ingenuity is necessary to select such factors and collect data about them. The latter difficulty refers to measurement of performance. The Toyo Keizai database gives (with about 45% response rate) three measurement categories, loss, break-even, and gain, defined by managers of MNE subsidiaries. Apart from the question of the validity of such measures, praised by some and criticized by others, it is evident that in a study taking the ultimate parent point of view, non-consolidated measures are inappropriate. Such a study requires consolidated measures of parent profitability. The present chapter will analyze performance by use of consolidated MNE-level financial data. It will also use the data in the Toyo Keizai database to compute performance measurement of the network itself, consolidating in this way the subsidiary level data. Finally, it will compare the results from these alternative performance measurements. All models are based on transaction cost and contingency theories (Nitsch et al., 1996).

3.2. Theory

Analyses of performance in the international business field generally start with discussion of transaction costs, as well as the eclectic theory of international production (Chen and Hu, 2002; Nitsch et al., 1996; Dunning, 1988). In fact the former is an integrative part of the latter theory (Andersen, 1997). The eclectic, or OLI (for ownership, location and internalization advantages) theory has received wide recognition in the scientific field of MNE activity. Therefore, it is appropriate to build an empirical model grounded on its concepts, and it is necessary to discuss these concepts and their predictive power for performance.

Ownership advantages are firm resources employed in the most efficient way for

increasing firm competitive advantage. They include proprietary assets like brand names, patents, and other intangibles. The studies on MNE activity have consistently shown that these ownership advantages are a determining factor for firm international behavior, including its expansion (Caves, 1996), choice of ownership structure (Hennart, 1991), stability of operations and superior performance (Nitsch et al., 1996). Firm experiences and knowledge also belong to this group of factors, the most important of which are international, industrial and host experiences (Delios and Henisz, 2000). It was suggested in the introduction of the present paper that firm network features are a new set of factors, developed by the firm and belonging to its ownership advantages. Some of these features (scope) are related to firm experiences (international); however, most network features are in fact closer to the second group of factors – internalization – although it is difficult to find the distinction line which separates them from ownership advantages. In fact, many scholars have measured or substituted in some way internalization advantages with some form of ownership factors (Andersen, 1997).

The difficulty of measuring exactly internalization advantages is notorious; however, their effect is clearly observable. Firms that have substituted markets with hierarchies, i.e. international expansion, are major example of this effect. Their network scope and intensity represent the extent of internalization of production factors, or more generally of factors along the value added chain. By increasing their extent of control these firms have access to a much larger set of strategic choices than firms unable to grow. It is expected, therefore, that their performance will be superior as well.

Location advantages complete the eclectic view of MNE activity by adding an independent (from MNEs) factor dimension in international business analysis. While the ownership and internalization factors express the accumulated competences, history

and the ongoing make-or-buy decisions and investment calculation on part of MNEs, the location factors lie beyond MNE sphere of control. In past studies host country risks and host culture were found relevant for MNE investment decisions and subsequent performance (Agarwal and Ramaswami, 1992; Gomes-Casseres, 1990). The present study confirmed in chapter 2 the strong effect of the second, especially when approximated by the power distance index (Hofstede, 1980) in the case of Europe, on firm entry mode and consequently on subsidiary daily operation. This chapter was an ambitious attempt to find other factors in the generally neglected set of location advantages (Dunning, 1998) beside political factors and cultural separation. Although the results of chapter 2 are successful with respect to this task, they point to only one additional such factor that is relevant for entry mode, and possibly subsidiary performance, and it is market growth. Market size is not ruled out as an appropriate location factor as well, although it is not very clear how to represent "markets" spatially in a world increasingly dominated both by regionalization and integration. Nevertheless, the last two variables are likely to have positive association with investment performance, while the former two (country risk and culture) are likely to have a negative effect on performance to the extent political instability or lower level of economic development increase the uncertainty for firm operations, and cultural separation creates difficulty in managing international human resources.

3.2.1. Hypotheses

In the introduction of this paper I set two main hypotheses concerning profitability and in the following two chapters I analyzed the validity of the major building blocks of these arguments. The first hypothesis concerns the MNE scope of activities, which stand

for the number of countries or regions in which a MNE has invested. As discussed above this scope or extent of activity is the observable side of the underlying internalization advantages. The first main hypothesis states that since scope stands always for increased control on part of the investor it will benefit firm operations, other things being equal. This is refutable on the grounds that there are incalculable costs to managing a hierarchy in the same way as with the costs of having a functioning market. However, the reason for this claim is not so much the nature of control itself. In a world of rational actors, which is a basic assumption of the present paper as well, MNEs are assumed to consider and calculate all relevant factors prior to expanding and in this sense the extent of internalization and expansion certainly reflects some optimal level. It is not so much that extended control or networks are superior to smaller ones, but rather that by engaging in or choosing expansion, firms come closer to their environment than with an arm's length market approach to it. This proximity forces them to acquire additional information and reduce thereby the informational asymmetry prevalent in the field of international business. Certainly, firms that enjoy in addition strong ownership advantages, like high levels of intangible assets or organizational know-how, are likely to utilize them most efficiently if they control this process.

Hypothesis 3.1. *The higher the MNE network scope, the better the MNE performance.*

Hypothesis 3.1(a). *For firms with high ownership advantage levels, high network scope is likely to lead to better performance.*

Firm intensity, on other hand, also represents increased proximity and control with respect to the host market, and is likely to have positive effect on firm operational

performance in the respective countries of intensive investment. However, it is not clear how intensity influences profitability of the overall network. It is likely to bring surplus revenues from increased proximity to intensively entered locations; however, these entries are also likely to tax heavily firm resources and ability to expand to other locations. Therefore, I suppose that the effect of intensity on overall firm performance is likely to be neutral.

Hypothesis 3.2. *Firm intensity is unlikely to influence profitability of the whole network.*

The second main proposition concerns the elements in network organization, which are outside the sphere of MNE control, even for MNEs with high scopes and reduced information asymmetry, because of independent power exerted on these components. This influence is local in nature and reflects the political, developmental, and social aspects of internationalization which lack the integrity or openness of the economic transactions (Dhanaraj and Beamish, 2005). Host political institutions and local culture are the forces most likely to shape MNE network elements like ownership and internal organization. The restrictive effect of the former force is likely to lead to suboptimal choices of subsidiary organization by MNEs (Padmanabhan and Cho, 1996; Gomes-Casseres, 1990), especially for those with high levels of ownership advantages. The constraining effect of the latter force, for example the power distance dimension of culture as was found in chapter 2, is likely to lead to suboptimal performance as well.

Hypothesis 3.3. *Higher country risk is likely to lead to worse MNE performance.*

Hypothesis 3.3(a). *For firms with high ownership advantage levels, high country risk is likely to lead to worse performance.*

Hypothesis 3.4. *High cultural distance between host location and investors' home country is likely to lead to worse performance.*

Ownership advantages are included as indispensable controls which, generally, are likely to lead to higher profitability because of higher returns associated with rents from them. Host market size and growth are elements of MNE environment that are likely to lead to better operational results and therefore are included also as controls in the models below. Other control variables include timing of first investment as control of potential for expansion evolution, and average age of subsidiaries as control of actual expansion growth. These time controls are necessary in the present cross sectional study and reflect the time a MNE has had to grow and the way this time is actually used. Generally, early times of first investment give firms opportunities to grow and therefore achieve a better performance, while big average age shows that a firm has stalled in its expansion and that therefore it is unlikely to have good performance. Final controls include those for firm location pattern, firm size, industry controls and reliance on partners for expansion. The first refers to the principal components describing firm location pattern (Table 1.11), one of which is correlated with firm presence in China which, as was shown in Chapter 1, adds an additional dimension to MNE growth strategy, a dimension characterized by high intensity of investment. Another dimension likely to influence firm profitability is presence in the US market (pc 1 in Table 1.11). The second control refers to firm size measured by firm assets. The third refers to the broader industry categories used in the database (the same used in Chapter 2). The fourth control refers to the extent a MNE sets subsidiaries with the help of other ultimate Japanese parents, either as joint equity partners or as clients and suppliers in a

keiretsu relationship. No specific hypotheses are set for these final four controls.

It is necessary to discuss in greater depth the causal direction for the above hypotheses of scope and intensity effects on firm performance. While it is clear that firm results have little influence on foreign country politics and culture, it can be argued that profitable operations are likely to expand and increase in scale/intensity. My claim is that the causal direction is generally from firm expansion to performance and not the opposite. Certainly, it is hard to grow if a firm is losing money; however, there is a generally held view in the strategy literature that strategy and profits are separate things, and strategy comes first. Many authors argue that increased *competition* levels and change in *environment* factors cause firm strategic moves despite the immediate risks of operating at loss (Makino and Delios, 2000; Tanaka, 1991). The Japanese companies especially are regarded as long-term, market-share oriented, rather than short-term profit oriented. Therefore, it is justifiable in my opinion to speak of one-directional hypotheses in the case of hypotheses 3.1 and 3.2, which connect firm-level expansion factors (scope and intensity) with firm performance, going from firms' decision to expand internationally to firm overall profitability.

On the other hand, it is not easy to determine the relationship between network location pattern and performance because of lack of underlying theory. It is best to treat any relationships between the principal components depicting investment location pattern (Table 1.11) and performance as association, which is the reason to leave location pattern as a control variable only. There are some previous studies, which theorize about firm foreign location pattern and performance (Hasegawa, 1997); however, they refer to the functional division of the value added chain activities across the location pattern, which variable is beyond the scope of the present study.

3.2.2. Models

Before testing the above hypotheses it is necessary to discuss the unit of measurement. The hypotheses do not mention explicitly whether the reference is to the manufacturing or to the entire network of subsidiaries. In contrast to analysis of entry mode, where manufacturing subsidiaries are the main object of focus, in analysis of profitability it is important to include the entire network. The reason for this is the similar role of both type of subsidiaries, as was explained in chapter 1 (footnote 8), in terms of sales and ultimately profitability. In the context of the present hypotheses, both types are involved in increasing the proximity to clients and in acquiring information. Therefore, most of the variables used to test the above hypotheses are based on both types of subsidiaries[30].

In addition to measurement levels on the side of the independent variables, it is necessary to discuss the different measurements of profitability. In light of revealed in recent years accounting frauds, in which even well-established firms were involved, the scholars in international business have hard time to justify reliance on accounting or other, mainly survey, measurements. In a context of great uncertainty, which profitability studies have to take as granted, it is certainly valuable to have some comparison of results that use different types of measurements, at least on a relative basis. The availability of two types of data on profitability in the present study makes possible such comparison and confirmation. One type is firm level ROA data, which are

[30] There are two variables, however, which have to be measured only on manufacturing level. One is intensity in terms of average counts, which in order to reflect genuine involvement, and not different distribution schemes, has to be on this level. However, intensity is better measured by country investment scale, which is numeric and naturally tends to reflect parent manufacturing subsidiaries or regional headquarters, therefore the numeric measurement for all subsidiaries is used in the analysis below. The other variable is the timing of the first investment. The latter measures the start of the expansion with the aim to differentiate MNEs on different stages of growth. It is arguable that by taking the first bigger involvement with an overseas location the moment of initial expansion is better reflected.

available for 740 from the 1052 firms in the initial sample. Another type is the survey results of performance which Toyo Keizai Inc. (2003) provides, measured at subsidiary level. In order to confirm that results are valid, I treat the latter data as numeric and calculate their average, which is the profitability of the *entire* network for *each* of the MNEs for which such data are available (a total of 617 from 1052 firms). If results remain stable for the two types of measurements for the dependent variable, then the conclusions will be sound.

3.3. Empirical design

The above hypotheses are tested on a subsample from the initial sample of 1052 Japanese manufacturing MNEs with 11288 subsidiaries in the world (Toyo Keizai Inc., 2003). Accounting data on pre-tax profit and total assets for computing ROA ratios are provided by Toyo Keizai Inc. (2001). There are data in this source on 740 MNEs. In addition, the performance variable in the former database was used to compute MNE averages. This variable has three values: 1 for good performance, 2 for fair or break-even, and 3 for loss. Although it is ordinal in nature it is admissible to use it as numeric in order to perform statistical tests. There are available survey data on 617 firms. The descriptive statistics below are based on the sample of 740 firms.

As for the independent variables, firm intangible assets divided by total fixed assets (Toyo Keizai Inc., 2001) when ordered form a rising line broken in three segments, with the first rising only slightly and the third very steeply. Scholars usually take logarithmic values of firm size figures to account for their diminishing effect, but another way to do so is by splitting the variable in three categories. Creating numeric categories in this

way is useful for replicating the tests directly on subsidiary level by using binary or ordinal multinomial regression as well. Therefore ownership advantage is measured by intangible assets of value 1 for intangibles to fixed assets ratios of less than 1.8% (519 firms, mean equals 0.7%), of value 3 for ratios above 1.8% but less than 2.9% (95 firms, mean equals 2.1%), and of value 8 for ratios above 2.9% (126 firms, mean equals 5.5%). Network scope measures the number of regions (based on Table 1.2) in the world where the MNE has presence in any industry, scaled by (divided to) the maximum possible scope of 28. MNE intensity equals the standard deviation of country investment scales for each MNE over all 28 countries/regions. This variable is high when investment is concentrated in few countries and low when there are few intensive investments. It is reliable measurement because there are no firms with high (or even greater than zero) investment scales in *all* 28 regions[31]. Time of first subsidiary is the age of the first manufacturing subsidiary in the network at 2002, and average age of the network is the average age of all subsidiaries (in any industry) except for the first. Firm size is the logarithm of parent non-consolidated fixed assets in million of yen. Reliance on Japanese partners is the ratio of number of such partnerships in which a MNE participates at 2002 divided to the number of all MNE subsidiaries. Keiretsu reliance is a dummy with three categories: related supplier firms whose investment location pattern overlaps 60% or more with that of their clients (115 firms), the client firms in these relationships (41 firms), and the remaining unrelated parent firms, which is the base category. Presence in China as well as the industry control variables are dummies set to

[31] When defining the intensity variable in this way, it is not necessary to use the threshold value of 2% of parent total assets for distinguishing the intensive investments. If the operationalization is based on this threshold value, e.g. by defining MNE intensity as the average scale over all hosts of a parent firm with country scale of at least 2% of firm total (non-consolidated) assets, the results remain similar. The correlation between both operationalizations is 0.89.

one when the firm has presence in China or belongs to the respective industry as defined in Chapter 2. Presence in China is alternatively measured by the third principal component from Table 1.11, and the remaining six principal components from this table are tested for their effect on profitability as well.

Finally, location variables are based on Maddison (2003) for market size and growth, and Hofstede (1980) for culture distance index. Country risk is measured by a ratio of the number of developing countries (on a country basis to account for the fact that identical factors influence subsidiaries from a same country) in the MNE network to total network scope. This variable is used as a proxy for country risk and is named "developing host ratio". It is related to the political hazards index of Delios and Henisz (2000) because the latter correlates highly with level of development (measured by GDP per capita). Practically all countries outside Europe (not including CEE), US, Canada, Australia, New Zealand, Hong Kong and Singapore are counted in the numerator. Culture distance is the average of the culture distance (with respect to Japan) indices of the countries in which a MNE has subsidiaries (in any industry because cultural factors are relevant for any kind of operation/servicing). Following previous studies, these indices are computed as the square root of the sum of the squared differences between Japan and a host location for the four main Hofstede's dimensions (Padmanabhan and Cho, 1996). Market size is average GDP in billions of 1990 fixed dollars, and market growth is an average of the increase in this GDP figure for each market for three consecutive years prior to, and until, 2001. Descriptive statistics and correlations for all variables are given in Table 3.1 and 3.2.

A multiple regression model is used to analyze the above data. Although there are theoretical constraints on both of the dependent variables, these are quite broader than

the 0-1 ratio scale and there is enough variability of values within them. The objective of comparing the coefficient and significance results for identical explanatory variables on two sets of dependent variables justifies the use of this method as well.

3.4. Results

Table 3.3 shows the results for one model based on ROA as dependent variable (Panel A) and for two models based on subsidiary average of profit (1), break-even (2), and loss (3) for each MNE as dependent variable (Panel B). All variables were tested one by one and in combination and only those that contribute to the model and its structural stability were retained. The only exception is the "intensity" and "intangibles" variables, which have correct signs and are central for the model, therefore they were retained. Interactions between intangibles on one side and scope or developing host ratio on another were not observed, which refutes the hypotheses 3.1(a) and 3.3(a). On the other hand, scope is significant and with positive sign in Panel A and negative in Panel B (Table 3.3), which supports hypothesis 3.1. Although intensity is not significant for network profitability, agreeing with hypothesis 3.2, it has signs that suggest that intensive investments are negatively related with overall firm performance. It is an intriguing connection that suggests that intensive investments tax heavily parents' resources and that pursuing multidomestic strategy do not pay as well as adopting global one. Interaction between scope and intensity is not significant and suggests (in all models) that the former has stronger explanatory power.

Hypothesis 3.3, concerning country risk, is supported as well by the correct negative sign of developing host ratio in Panel A and positive in Panel B (Table 3.3), both with

high significance levels. The final main hypothesis concerning culture (hypothesis 3.4) is also supported in both models by the correct signs and the high significance in Panel A, although this levels drops somewhat in Panel B (Table 3.3). From the controls for regional strategy defining presence in China, the operationalization by PC 3 in Table 1.11 is most significant, and was used as respective operationalization. (Panel A, model ROA). It is negatively correlated to ROA. Presence in USA (PC1) is also of marginal significance (at 0.13 level), but positively correlated with ROA. However, both location pattern variables are not significant with respect to the dependent variable from Panel B. These two regional strategies are the only ones that have somewhat significant relationship with performance; therefore the others are not shown in the model. Keiretsu relationship turns out to be negatively related with performance in both models from Panel A and Panel B, but significantly so only with respect to ROA. This result is contrary to the expected positive influence of such relationships on profitability. The industry controls are not significant and therefore not shown in the model in Panel A.

From the remaining control variables market growth has the expected sign and is significant at 0.05 level, while market size does not contribute to the explanatory strength of the model and is dropped. Intangibles have the expected sign, although it is not significant. Age of first manufacturing subsidiary and network average age are highly correlated and have similar effect on ROA (with similar significance) when included separately in the model. I decided to keep the latter variable because it contains more information than the former. The results are controversial: first, these two variables are supposed to influence differently ROA, and second, although the effect of big average subsidiary age on ROA is negative, as was expected to be because of firm stalled growth and development, it does not switch sign in the second model in Panel B.

Finally, Japanese partner reliance has significant negative effect on ROA, which shows either that the partnerships are inefficient, or that firms that do not stand alone probably enjoy fewer ownership advantages and profit opportunities. Although the result is somewhat counterintuitive, it is supported by the finding in chapter 2 that subsidiaries with second parent rely on local partners at least as much as they are able to stand alone in a wholly Japanese-owned venture.

Table 3.3, Panel B shows how the above significant results, with the only exception of network average age and firm size, remain stable and consistent when the ROA dependent variable is replaced with another based on direct survey measurements. It is indeed remarkable consistency that gives credibility to the explanatory variables of the models despite low values of R^2, which reflect the wide diversity of factors that influence profitability (it is reflected in the significant constant, as well). Beside the weak effects of PC 1, PC 3 and keiretsu relatedness in the second model, there are only three minor changes. First, MNEs in automobile industry appear to have lower profitability than the other industries, but in the ROA model this effect is insignificant. Most likely this difference reflects the fact that ROA is based on the Japanese MNE internal market as well, in addition to their overseas markets. Automobiles may indeed perform worse abroad than the other industries, but when performance in the domestic market is pooled in the consolidated ROA measurement this difference disappears. Second, average age is significantly but positively associated with performance in the models from Panel B, without observed change in the sign as with the other main variables. It is likely that this variable reflects different things on the different levels of measurement of profitability. When it refers to ROA it stands really for unrealized growth potential and therefore has the expected negative sign. When it refers to

subsidiary performance it measures the age of these few subsidiaries, i.e. host experiences and knowledge, and is therefore likely to be positively associated with their results. Third, firm size is significantly and negatively related to ROA, but positively (with decreased significance level of 0.11) to the profitability of the subsidiary network. This suggests that bigger firms have exhausted the profitable opportunities at home, where their positioning is threatened by small and/or new entrepreneurs, but the same sizeable firms are profiting from their overseas positions or expansion, for which their size represents advantage not enjoyed by other smaller firms.

3.5. Discussion

The findings from the three models suggest that network and location features are indeed relevant variables for predicting MNE performance. Although the low measures of fit suggest that further investigation is needed to find other determinants of profitability, the consistency of the results based on two unrelated performance measurements is remarkable. The comparison shows that MNE network variables are indeed complementary to ownership advantages for explanation of firm results. It also supports the theory of internalization and the claim that a hierarchical organization is superior to market reliance because it reduces inherent information asymmetry by increased firm participation in and control of its environment.

The findings have the potential to explain some controversies in the literature concerning the effect of international diversification on performance. The result that scope and intensity are likely to have consistent opposite effect on performance, the former positive and the latter negative, is of great importance for researchers who use

mostly overall foreign involvement measure of internationalization. As this measure reflects both scope and intensity, the results will depend on the sample selection. Samples that include firms with relatively small intensity levels but high scope will produce positive relationship, while samples that happen to include firms with high intensity levels will produce negative relationship. Therefore, it is important to include separate variables for both scope and intensity in any analysis of performance.

The compared profitability models in Table 3.3 show that independent local level factors outside firm sphere of control also play the expected (negative) role in firm results. Nevertheless, because of the poor proxy of country risk used, it is necessary to discuss how to replicate the analysis by alternative location factor variables. It is also necessary to discuss about variables that are likely to moderate the relationship, and more specifically about entry mode. Entry mode was found previously to affect performance, based on transaction cost theoretic reasoning similar to the one employed in this chapter. Results from previous research show that joint ventures perform generally worse than wholly owned ones, but better than acquisitions (Nitsch et al., 1996). Finally, replication of results on subsidiary level is discussed below.

Both political and cultural location variables are theoretically sound, and chapter 2 has found that culture (PDI) has very strong effect on subsidiary organization and management. Therefore, new operationalization of these variables for purposes of replication is likely to improve the profitability models. There is a possibility for such improvement with measurements from a survey of world competitiveness, which were found to correlate highly with political and social environment (Dhanaraj and Beamish, 2005). In fact factor analytical results suggest that they form two independent dimensions of political openness, which expresses location political risks, and social

openness (Dhanaraj and Beamish, 2005: Table 1). The latter, however, expresses more attitudes to foreign firms and has no defined relationship with power distance. If its inclusion in the model of chapter 2 shows, however, that it is an alternative explanation for regional differences across Europe, then its validity for the analysis of profitability will be improved. In general, these two measures are likely to improve the performance models because of their independence.

Another way of improving these models is by including entry mode variables in them. Entry mode is essentially a moderating variable in the present context, because all independent variables in the models theoretically determine both performance levels and entry mode choices jointly. In addition, entry modes represent only the subsidiary organization adopted at the time of entry, and ownership structures change with time. Some firms replace their joint ventures with wholly owned subsidiaries, while others stick to their initial local joint venture partners[32]. The database provides ample examples of both strategies (Toyo Keizai Inc., 2003). Therefore, a detailed analysis of this strategic change, or at least of the initial (at entry) and present (at 2001) ownership structure, is likely to show the actual exposure to the relevant location variables. As a minimal starting point in this respect only present ownership structures may be included as averages in the models. Entry mode is likely, however, to have stronger predictive power in models based on subsidiary level performance[33].

Replication of the above results on subsidiary level is likely to clarify the role of entry

[32] Joint ventures always include presence of local partner firm(s) and throughout the paper wholly owned subsidiaries of two or more Japanese partners are not treated as joint ventures, but reflected in the second parent (chapter 2) or partner reliance (chapter 3) variables.

[33] Nevertheless, I included joint venture and acquisition ratios in the models above, defined as the ratio of the number of subsidiaries with such structures at 2001 to all subsidiaries for each MNE. Both are not significant in the models of Table 3.3, Panel B, but joint venture ratio is significant in the model based on ROA, and influences negatively performance.

mode and have greater precision with respect to variables that will not be used in average values, for example cultural distance and market growth. This perspective, however, has the deficiency of losing the forest for the trees in the sense that it will not be able to reflect property MNE strategic variables like presence in certain regions and overall exposure to country risks. In addition, it is difficult to hypothesize about effects on performance with respect to sales subsidiaries, because virtually all previous studies in the field have focused exclusively on manufacturing subsidiaries.

Conclusion

The implications of the present paper can be split to two broad categories: contribution to the current state of research and implication for multinational enterprise (MNE) managers. The former is further divided to (i) the contribution to the analysis of profitability that network scope and intensity bring as substitutes of overall foreign activity indices, (ii) the contribution to the current state of research on location patterns, and (iii) contribution to the research of location advantages. In the case of the first it is a logical inconsistency that has been corrected. In the case of the second it is the new perspective on Japanese MNE location patterns that was developed, as well as the sharp analytical methods (multidimensional scaling, correspondence analysis, and principal component analysis) that were introduced, based on two different level of measurement - counts and numeric - for achieving greater precision in observing the location patterns. In the case of the third it is the importance of market growth and host culture for MNE expansion that was confirmed.

The present paper studied extensively the constitutive elements of MNE networks of subsidiaries and established the validity of three main features: scope, intensity and location pattern of the network. It showed that the first two of these features are supported by sound theoretical reasoning and empirical evidence. Scope and intensity fulfilled their purpose of splitting the overall foreign activity measure of international diversification, which is most often used in the literature (Geringer et al., 2000), in two unrelated parts. The paper showed that these parts are likely to have different effect on profitability, with scope contributing to it, and intensity affecting it negatively. The

significance of the latter result does not reach the critical 0.05 level, which may be attributed to certain shortcomings in the definition of this novel variable.

The third network feature of location pattern revealed no peculiar combination or portfolio of locations that diversified firms hold, beside the trivial case of a single country (China, or US) or at most comparison between adjacent regions like NIEs and ASEAN. This variable has also relatively weak influence on performance and is likely to be explained by the time of MNE initial foreign investment, MNE firm size, and geographical distance of the countries from Japan. The main hosts of international activity for the Japanese MNEs are the sizeable markets "around" Japan – China, Thailand, US, Indonesia, Korea, and Taiwan – because they are at the center of the configuration produced by correspondence analysis, the main dimensions in multidimensional scaling analysis, and the underlying locations for the first four dimensions of the principal component analysis result. The paper revealed also location pattern connection with scope and intensity. While Japanese MNEs generally view the investment locations in terms of market size and production cost, which the correspondence analysis showed, only the most diversified in terms of scope expand to small markets. Intensity is remarkably related with presence in China, where highly intensive involvement is a rule rather than exception, despite a multitude of regulations that this country imposes on foreign investors. However, the location pattern outside China for most firms, which are of small to medium size, is centered on US, ASEAN and NIEs. If there is some contrast between the latter two regions it probably reflects production cost differentials.

While it is reasonable to expect that the non-Japanese MNEs also view investment locations in terms of market importance and operation cost levels, it is difficult to

compare directly the location pattern results with those based on MNEs from other countries. Rugman and Verbeke (2003) find that for a majority of big European and American MNEs, location patterns include relatively few, geographically close countries. This finding is similar to the result of the present paper. Another evidence for similarity is the enormous focus placed on China on part of European and American firms. The unusual feature of this country in terms of population, labor cost, and especially growth potential are the main reasons for its prominent place in MNE location portfolio. The discussion of investment patterns would benefit greatly from further development of underlying theory of "portfolio of locations". Some attempts in this respect are made by analyzing MNE functional division across the various invested locations (Hasegawa, 1997).

Important influence on MNE subsidiary network comes from subsidiary location features and their effect on MNE strategy. Chapter 2 showed that cultural differences influence the organization of MNE subsidiaries in accordance with the distribution of their locations. It showed that in the European context of few political restrictions the power distance index is the most important cultural dimension in the life of the subsidiary. The reason for this significance is the fact that in high power distance countries there is both greater necessity of management personnel and attitude of "constraining" the foreign investors. These factors influence MNE choice of joint venture ownership structure. In the context of Chapter 3, referring to all countries in the world, however, it is necessary to reintroduce the remaining cultural dimensions. The usual composite index of Euclidean distance to investor home country over all cultural indices was found negatively related to performance. This result arises from the difficulty of managing personnel in culturally distant host countries.

In summary, the two main groups of network factors – one at headquarter level (scope), and others at local level (developing host ratio and culture) – were found to influence significantly MNE performance, the former positively, and the latter negatively. The combination of headquarter and local level variables provides the necessary broader approach to MNE activity, suggested by well-established theories like the eclectic theory of internationalization. In addition, the paper contributes also to deeper understanding of each of these components separately. With respect to MNE headquarter-level decisions, it introduced the novel concepts of scope, location pattern, and intensity to depict firm international networks, and corrected the error of viewing subsidiaries that belong to one network as independent units of analysis, by referring always to the ultimate parent of a subsidiary. With respect to location effects it made the novel contribution of introducing and testing new variables besides country risk and culture. One of them, local growth, was retained in the analysis of profitability as well and showed the expected positive influence on firm results. The methodology for analyzing and validating determinants of profitability by comparison of several models based on different profit measurements is the final contribution to the field of MNE research that the present study made. The profitability analyses are performed with respect to the whole MNE network, on identical explanatory variables, and for two unrelated measures of profitability – an accounting-based ROA, and survey-based ordinal assessment of profitability. The consistency of the results for these alternative dependent variables confirms the reliability of the findings.

The empirical support of headquarter and local level factor influence on MNE operations was expected on the basis of transaction cost reasoning. The general claims that underlie the main propositions of the paper are that hierarchies create efficiency

when replacing the market because of increased firm scope of participation and control and simultaneous decrease of informational asymmetry in international transactions. Therefore, one implication for management is that whenever an opportunity for investment in a new country is deemed beneficial based on cost-benefit analyses, there is always the additional benefit, not expressed in digits, of increased ability through participation, and decreased informational asymmetry through new knowledge acquisition. These additional benefits do not compensate, however, for the existence in host environments of elements with bargaining power or power of tradition, like host institutional structure and culture. These elements are likely to exert independent (negative) influence on firm operations. Another suggestion to managers is made with respect to their decision of increasing the involvement with individual host countries. Although the negative influence of intensity on performance has weaker statistical significance, it is better to adopt a conservative stance and think twice whether to increase investment intensity in any country.

It is necessary to point out the limitations of my study in order to provide guidelines for improvement in future research. First, when comparing investment location pattern, the paper focused on *country* portfolios only. It is possible to select other variables for calculating MNE dissimilarities with respect to expansion patterns, like amount invested in regions *inside* countries, for the biggest countries at least. Second, inclusion of more time related data is likely to reveal better MNE growth evolution and find patterns in it that the present study is unable to observe. Third, analysis of factors that distinguish genuine MNEs from international firms that do not grow beyond a single location will help increase the precision in selecting the cases for study of MNE strategy. Fourth, inclusion of keiretsu variables as location-related factors in Chapter 2 as well, will

increase the validity of the obtained location effects because firm strategy of "follow your client" appear to have relevance for this firm network growth and entry mode. Fifth, new operationalization for country risk and social openness are likely to improve the empirical tests of these factor effects on performance. The same improvement is expected as well from a carefully designed and meaningful comparison between MNE and subsidiary level performance. Finally, all results are conditional on the choice of the investor country and have to be replicated by studies of MNEs from other nations beside Japan, in order to receive additional validation and recognition.

TABLES

Table 1-1: Country distribution of 1052 MNEs from Japan at the end of 2001

Country name	MNE	subsid	manuf	sale	res.	other	groups by FDI concentration	Num. in Table 1.2	groups by region	Num. in Table 1.3
China	524	1335	*1132*	*124*	*7*	*72*	China	1	China	1
Korea	256	348	*253*	*71*	*1*	*23*	Korea	2	NIEs	2
Taiwan	411	581	*390*	*172*	*0*	*19*	Taiwan	3	NIEs	2
Hong Kong	373	572	*159*	*350*	*0*	*63*	Hong Kong	4	NIEs	2
Singapore	401	633	*239*	*309*	*0*	*85*	Singapore	5	NIEs	2
Thailand	436	814	*625*	*138*	*0*	*51*	Thailand	6	ASEAN	3
Malaysia	308	540	*409*	*103*	*1*	*27*	Malaysia	7	ASEAN	3
Philippines	186	273	*210*	*41*	*3*	*19*	Philippines	8	ASEAN	3
Indonesia	268	420	*382*	*21*	*4*	*13*	Indonesia	9	ASEAN	3
Vietnam	80	94	*85*	*2*	*0*	*7*	Vietnam	10	ASEAN	3
India	94	134	*118*	*8*	*0*	*8*	India,Pak,SLan	11	restAsia	4
Pakistan	10	13	*12*	*1*	*0*	*0*	India,Pak,SLan	11	restAsia	4
Sri Lanka	10	11	*9*	*0*	*0*	*2*	India,Pak,SLan	11	restAsia	4
Macao	4	4	*2*	*2*	*0*	*0*	restAsia	12	restAsia	4
Brunei	1	1	*1*	*0*	*0*	*0*	restAsia	12	restAsia	4
Cambodia	1	1	*1*	*0*	*0*	*0*	restAsia	12	restAsia	4
Laos	1	1	*1*	*0*	*0*	*0*	restAsia	12	restAsia	4
Myanmar	7	7	*3*	*1*	*0*	*3*	restAsia	12	restAsia	4
Maldives	1	1	*0*	*0*	*0*	*1*	restAsia	12	restAsia	4
Bangladesh	5	5	*5*	*0*	*0*	*0*	restAsia	12	restAsia	4
Nepal	1	1	*0*	*0*	*0*	*1*	restAsia	12	restAsia	4
Iran	3	3	*2*	*1*	*0*	*0*	restAsia	12	restAsia	4
Bahrain	1	1	*0*	*1*	*0*	*0*	restAsia	12	restAsia	4
Saudi Arabia	12	12	*9*	*3*	*0*	*0*	restAsia	12	restAsia	4
Kuwait	2	2	*2*	*0*	*0*	*0*	restAsia	12	restAsia	4
Oman	1	1	*1*	*0*	*0*	*0*	restAsia	12	restAsia	4
Israel	6	6	*4*	*1*	*0*	*1*	restAsia	12	restAsia	4
Lebanon	1	1	*1*	*0*	*0*	*0*	restAsia	12	restAsia	4
UAE	16	16	*1*	*14*	*0*	*1*	restAsia	12	restAsia	4
Russia	12	12	*4*	*7*	*0*	*1*	restAsia	12	restAsia	4
Canada	154	201	*77*	*100*	*3*	*21*	Canada	13	US,Can	5
US	966	2066	*974*	*608*	*13*	*471*	US	14	US,Can	5
Mexico	126	148	*101*	*39*	*2*	*6*	Mexico	15	Mexico	6
Brazil	158	193	*114*	*57*	*5*	*17*	Brazil	16	Brazil	7
Guatemala	1	1	*1*	*0*	*0*	*0*	restCenSouAmer	17	restAme	8
Honduras	1	1	*1*	*0*	*0*	*0*	restCenSouAmer	17	restAme	8
El Salvador	3	3	*3*	*0*	*0*	*0*	restCenSouAmer	17	restAme	8
Costa Rica	5	5	*3*	*2*	*0*	*0*	restCenSouAmer	17	restAme	8
Panama	17	18	*1*	*11*	*0*	*6*	restCenSouAmer	17	restAme	8
Bermudas	4	5	*0*	*1*	*0*	*4*	restCenSouAmer	17	restAme	8
Bahamas	1	1	*0*	*0*	*0*	*1*	restCenSouAmer	17	restAme	8
Barbados	1	1	*0*	*1*	*0*	*0*	restCenSouAmer	17	restAme	8
TrinidadTobago	1	1	*1*	*0*	*0*	*0*	restCenSouAmer	17	restAme	8
Puerto Rico	4	4	*2*	*2*	*0*	*0*	restCenSouAmer	17	restAme	8
Antilles	2	2	*0*	*0*	*0*	*2*	restCenSouAmer	17	restAme	8
Cayman Is.	3	3	*0*	*0*	*0*	*3*	restCenSouAmer	17	restAme	8
Virgin Is.	4	4	*0*	*1*	*0*	*3*	restCenSouAmer	17	restAme	8
Colombia	10	12	*7*	*4*	*0*	*1*	restCenSouAmer	17	restAme	8
Venezuela	15	15	*9*	*6*	*0*	*0*	restCenSouAmer	17	restAme	8
Ecuador	2	2	*1*	*0*	*1*	*0*	restCenSouAmer	17	restAme	8
Peru	8	9	*3*	*5*	*1*	*0*	restCenSouAmer	17	restAme	8
Bolivia	1	1	*1*	*0*	*0*	*0*	restCenSouAmer	17	restAme	8
Chile	16	16	*4*	*8*	*3*	*1*	restCenSouAmer	17	restAme	8
Argentina	22	25	*10*	*13*	*0*	*2*	restCenSouAmer	17	restAme	8
UK	339	572	*226*	*233*	*3*	*110*	UK and Ireland	22	UK&Ire	10
Ireland	23	23	*15*	*8*	*0*	*0*	UK and Ireland	22	UK&Ire	10
Norway	12	12	*0*	*11*	*0*	*1*	SweDenNorFin	18	NorthEu	9
Sweden	47	52	*13*	*36*	*0*	*3*	SweDenNorFin	18	NorthEu	9
Denmark	19	20	*3*	*16*	*0*	*1*	SweDenNorFin	18	NorthEu	9

Table 1-1: Country distribution of 1052 MNEs from Japan at the end of 2001, continued

Country name	MNE	subsid	manuf	sale	res.	other	groups by FDI concentration	Num. in Table 1.2	Groups by region	Num. in Table 1.3
Finland	15	18	*4*	*9*	*0*	*5*	SweDenNorFin	18	NorthEu	9
Germany	339	490	*107*	*339*	*0*	*44*	GermAusSwitz	19	NorthEu	9
Switzerland	41	46	*4*	*37*	*0*	*5*	GermAusSwitz	19	NorthEu	9
Austria	31	34	*5*	*28*	*0*	*1*	GermAusSwitz	19	NorthEu	9
Netherlands	181	285	*56*	*114*	*2*	*113*	Netherlands	20	NorthEu	9
Belgium	85	108	*42*	*57*	*0*	*9*	Belgium&Lux.	21	NorthEu	9
Luxemburg	8	9	*2*	*5*	*0*	*2*	Belgium&Lux.	21	NorthEu	9
France	195	272	*94*	*147*	*0*	*31*	France	23	SouthEu	11
Portugal	24	29	*14*	*13*	*0*	*2*	Spain&Portugal	24	SouthEu	11
Spain	96	115	*45*	*64*	*1*	*5*	Spain&Portugal	24	SouthEu	11
Italy	116	138	*45*	*89*	*0*	*4*	Italy&Greece	25	SouthEu	11
Malta	1	1	*0*	*1*	*0*	*0*	Italy&Greece	25	SouthEu	11
Greece	6	6	*3*	*3*	*0*	*0*	Italy&Greece	25	SouthEu	11
Poland	32	34	*11*	*22*	*0*	*1*	CEE	26	CEE	12
Czech Rep.	25	27	*10*	*17*	*0*	*0*	CEE	26	CEE	12
Hungary	39	42	*25*	*15*	*0*	*2*	CEE	26	CEE	12
Romania	5	5	*1*	*4*	*0*	*0*	CEE	26	CEE	12
Bulgaria	2	2	*0*	*2*	*0*	*0*	CEE	26	CEE	12
Cyprus	1	1	*0*	*1*	*0*	*0*	CEE	26	CEE	12
Turkey	10	12	*9*	*2*	*1*	*0*	CEE	26	CEE	12
Ukraine	1	1	*0*	*1*	*0*	*0*	CEE	26	CEE	12
Slovak Rep.	7	8	*5*	*3*	*0*	*0*	CEE	26	CEE	12
Slovenia	2	2	*0*	*1*	*0*	*1*	CEE	26	CEE	12
Croatia	1	1	*0*	*1*	*0*	*0*	CEE	26	CEE	12
Australia	155	229	*63*	*111*	*19*	*36*	Australia&NZ	27	AusNZ	13
New Zealand	44	48	*15*	*27*	*3*	*3*	Australia&NZ	27	AusNZ	13
Morocco	1	1	*1*	*0*	*0*	*0*	restAfr&Oceania	28	restAfO	14
Algeria	1	1	*1*	*0*	*0*	*0*	restAfr&Oceania	28	restAfO	14
Tunisia	1	1	*1*	*0*	*0*	*0*	restAfr&Oceania	28	restAfO	14
Egypt	5	5	*3*	*1*	*0*	*1*	restAfr&Oceania	28	restAfO	14
Liberia	2	7	*0*	*0*	*0*	*7*	restAfr&Oceania	28	restAfO	14
Cote d'Ivoire	1	1	*1*	*0*	*0*	*0*	restAfr&Oceania	28	restAfO	14
Ghana	1	1	*1*	*0*	*0*	*0*	restAfr&Oceania	28	restAfO	14
Nigeria	6	7	*7*	*0*	*0*	*0*	restAfr&Oceania	28	restAfO	14
Ethiopia	1	1	*1*	*0*	*0*	*0*	restAfr&Oceania	28	restAfO	14
Kenya	1	1	*1*	*0*	*0*	*0*	restAfr&Oceania	28	restAfO	14
Tanzania	3	3	*3*	*0*	*0*	*0*	restAfr&Oceania	28	restAfO	14
Madagascar	1	1	*1*	*0*	*0*	*0*	restAfr&Oceania	28	restAfO	14
Zimbabwe	1	1	*0*	*1*	*0*	*0*	restAfr&Oceania	28	restAfO	14
South Africa	17	18	*3*	*11*	*2*	*2*	restAfr&Oceania	28	restAfO	14
Swaziland	1	1	*1*	*0*	*0*	*0*	restAfr&Oceania	28	restAfO	14
PapuaNewG.	1	1	*1*	*0*	*0*	*0*	restAfr&Oceania	28	restAfO	14
Samoa	1	1	*1*	*0*	*0*	*0*	restAfr&Oceania	28	restAfO	14
Salomon Is.	1	2	*1*	*0*	*0*	*1*	restAfr&Oceania	28	restAfO	14
New Caledonia	1	1	*0*	*0*	*1*	*0*	restAfr&Oceania	28	restAfO	14
Guam	8	8	*0*	*3*	*0*	*5*	restAfr&Oceania	28	restAfO	14
Saipan	3	3	*1*	*0*	*0*	*2*	restAfr&Oceania	28	restAfO	14

[a] Number of subsidiaries per country is bigger than MNE number because some MNE country intensity is bigger than 1. Number of MNEs does not add to 1052 because MNE country scope is bigger than 1.

Source: Toyo Keizai Inc., 2003.

Table 1-2: Country groups by FDI concentration

	region name [a, b]	number MNEs	number subsidiary	manufac	sales	res.	other industry	manufacturing to total number
1	China	524	1335	*1132*	*124*	*7*	*72*	0.85
2	Korea	256	348	*253*	*71*	*1*	*23*	0.73
3	Taiwan	411	581	*390*	*172*	*0*	*19*	0.67
4	Hong Kong	373	572	*159*	*350*	*0*	*63*	0.28
5	Singapore	401	633	*239*	*309*	*0*	*85*	0.38
6	Thailand	436	814	*625*	*138*	*0*	*51*	0.77
7	Malaysia	308	540	*409*	*103*	*1*	*27*	0.76
8	Philippines	186	273	*210*	*41*	*3*	*19*	0.77
9	Indonesia	268	420	*382*	*21*	*4*	*13*	0.91
10	Vietnam	80	94	*85*	*2*	*0*	*7*	0.9
11	India, Pakistan, Sri Lanka	102	158	*139*	*9*	*0*	*10*	0.88
12	rest of Asia	52	75	*37*	*30*	*0*	*8*	0.49
13	Canada	154	201	*77*	*100*	*3*	*21*	0.38
14	US	966	2066	*974*	*608*	*13*	*471*	0.47
15	Mexico	126	148	*101*	*39*	*2*	*6*	0.68
16	Brazil	158	193	*114*	*57*	*5*	*17*	0.59
17	restCentral/SouthAmerica	79	129	*47*	*54*	*5*	*23*	0.36
18	Scandinavian countries	59	102	*20*	*72*	*0*	*10*	0.2
19	Germany,Austria,Switzer.	354	570	*116*	*404*	*0*	*50*	0.2
20	Netherlands	181	285	*56*	*114*	*2*	*113*	0.2
21	Belgium and Luxemburg	93	117	*44*	*62*	*0*	*11*	0.38
22	UK and Ireland	354	595	*241*	*241*	*3*	*110*	0.41
23	France	195	272	*94*	*147*	*0*	*31*	0.35
24	Spain and Portugal	107	144	*59*	*77*	*1*	*7*	0.41
25	Italy and Greece	120	145	*48*	*93*	*0*	*4*	0.33
26	Central Eastern Europe	74	135	*61*	*69*	*1*	*4*	0.45
27	Australia, New Zealand	184	277	*78*	*138*	*22*	*39*	0.28
28	rest Africa and Oceania	58	66	*29*	*16*	*3*	*18*	0.44
	Total [c]	n.a.	11288	*6219*	*3661*	*76*	*1332*	0.55

[a] From the countries in Table 1.1 there are 24 countries with number of investors or subsidiaries of about 50 or bigger. From the remaining countries 7 have about 30 to 40 investors/subsidiaries, 16 countries have about 10 to 20 investors/subsidiaries, while the rest 59 countries have marginal FDI concentration. The high concentration countries with their neighbors form 24 of the regions in Table 1.2, while the remaining low concentration countries form the rest 4 regions (whose numbers are in bold).

[b] Table 1.1 shows member countries for each of the regions above. All data are as of the end of 2001.

[c] Number of subsidiaries per region is bigger than MNE number because some MNE region intensity is bigger than 1. Number of MNEs does not add to 1052 because MNE region scope is bigger than 1. The sum of MNE numbers for member countries in a region is different from the MNE number for the same region because of certain extent of overlap, i.e. there are parents who invest in several members.

Source: Toyo Keizai Inc., 2003.

Table 1-3: Country groups by regional blocks

	region name [a]	number MNEs	number subsidiaries	manufact.	sales	resource	other industry	manufacturing to total number
1	China	524	1335	*1132*	*124*	*7*	*72*	0.85
2	NIEs	728	2134	*1041*	*902*	*1*	*190*	0.49
3	ASEAN	654	2141	*1711*	*305*	*8*	*117*	0.8
4	India&rest of Asia	131	233	*176*	*39*	*0*	*18*	0.76
5	US&Canada	972	2267	*1051*	*708*	*16*	*492*	0.46
6	Mexico	126	148	*101*	*39*	*2*	*6*	0.68
7	Brazil	158	193	*114*	*57*	*5*	*17*	0.59
8	restCentSouth Ame	79	129	*47*	*54*	*5*	*23*	0.36
9	Northern Europe	469	1074	*236*	*652*	*2*	*184*	0.22
10	UK and Ireland	354	595	*241*	*241*	*3*	*110*	0.41
11	Southern Europe	263	561	*201*	*317*	*1*	*42*	0.36
12	CentralEasternEurope	74	135	*61*	*69*	*1*	*4*	0.45
13	Australia&NewZeal	184	277	*78*	*138*	*22*	*39*	0.28
14	restAfrica&Oceania	58	66	*29*	*16*	*3*	*18*	0.44
	Total [b]	**n.a.**	11288	*6219*	*3661*	*76*	*1332*	0.55

[a] NIEs include Korea, Taiwan, Hong Kong and Singapore. ASEAN countries include Thailand, Malaysia, Indonesia, Philippines and Vietnam. Table 1.1 shows member countries for each of the regions above. All data are as of the end of 2001.

[b] Number of subsidiaries per region is bigger than MNE number because some MNE region intensity is bigger than 1. Number of MNEs does not add to 1052 because MNE region scope is bigger than 1. The sum of MNE numbers for member countries in a region is different from the MNE number for the same region because of certain extent of overlap, i.e. there are parents who invest in several members.

Source: Toyo Keizai Inc., 2003.

Table 1-4: Comparison of MNE location patterns

	Region [a, b, c]	MNE1	MNE2	MNE3	MNE4	MNE5	MNE k	Total MNEs
1	China	1	0	0	0	0	....	524
2	NIEs	1	0	1	0	1	....	728
3	ASEAN	0	1	0	0	0	....	654
4	India&rest of Asia	0	0	0	0	0	....	131
5	US&Canada	1	1	1	1	1	....	972
6	Mexico	0	0	0	0	0	....	126
7	Brazil	0	0	0	1	0	....	158
8	restCenSouth America	0	0	0	0	0	....	79
9	Northern Europe	0	0	1	0	0	....	469
10	UK and Ireland	0	0	0	0	0	....	354
11	Southern Europe	0	0	0	1	0	....	263
12	CentralEasternEurope	0	0	0	0	0	....	74
13	Australia&NewZeal.	0	0	0	0	0	....	184
14	restAfrica&Oceania	0	1	0	0	0	....	58
1	China	1	0	0	0	0	....	*495*
2	NIEs	0	0	1	0	0	....	*505*
3	ASEAN	0	1	0	0	0	....	*600*
4	India&rest of Asia	0	0	0	0	0	....	*108*
5	US&Canada	1	1	1	1	0	....	*619*
6	Mexico	0	0	0	0	0	....	*93*
7	Brazil	0	0	0	1	0	....	*112*
8	restCenSouth America	0	0	0	0	0	....	*33*
9	Northern Europe	0	0	1	0	0	....	*169*
10	UK and Ireland	0	0	0	0	0	....	*196*
11	Southern Europe	0	0	0	1	0	....	*149*
12	CentralEasternEurope	0	0	0	0	0	....	*50*
13	Australia&NewZeal	0	0	0	0	0	....	*75*
14	restAfrica&Oceania	0	1	0	0	0	....	*29*
	Scope 1	5	6	6	6	2	....	
	Scope 2	3	3	3	3	2	....	

[a] Table 1.1 shows member countries for each of the regions. All data are as of the end of 2001.

[b] Number of MNEs does not add to 1052 because MNE region scope is bigger than 1.

[c] For each region and MNE the first 14 rows below the title show presence (coded 1) of manufacturing or sales ("others" included in sales) subsidiaries in that region. The last 14 rows show only manufacturing subsidiary presence. Scope 1 refers to the column total, while scope 2 is the total of the first 14 entries of each column/MNE.

Source: Toyo Keizai Inc., 2003.

Table 1-5: Multiple regression of four dimensional descriptors on the configuration axis of a four dimensional MDS solution for a random sample (N=100) of 1052 MNEs

Positive interpretation poles	Standardized coefficients				Multiple correlation (** = 0.01 significance level)
	dimension 1	dimension 2	dimension 3	dimension 4	
Scope 1	**-0.896**	-0.050	0.211	-0.078	0.989**
Scope 2	**-0.864**	-0.191	0.143	-0.094	0.957**
NtoAC	0.043	0.077	-0.264	**-0.820**	0.858**
AtoNC	0.373	0.386	**0.741**	0.178	0.843**
CtoAN	-0.399	-0.444	-0.465	0.595	0.904**

Table 1-6: Multiple regression of dimensional descriptors on four and three dimensional configurations for the sample in Figure 1.9, standardized coefficients

	Scope 1	Scope2	NtoAC	AtoNC	CtoAN	NtoA
Dimension 1 from 4	**-0.939**	**-0.913**	0.147	0.162	-0.260	-0.072
Dimension 2 from 4	0.046	-0.124	**-0.684**	**0.676**	-0.013	**-0.711**
Dimension 3 from 4	-0.095	-0.049	0.172	-0.330	0.257	0.252
Dimension 4 from 4	-0.076	-0.075	0.410	0.081	**-0.779**	0.213
Multiple correlation (** = 0.01 signif.level)	0.95**	0.93**	0.81**	0.78**	0.85**	0.78**
Dimension 1 from 3	**-0.941**	**-0.913**	0.137	0.137	-0.207	-0.066
Dimension 2 from 3	0.056	-0.115	**-0.641**	**0.620**	0.002	**-0.658**
Dimension 3 from 3	-0.045	-0.053	0.253	0.242	**-0.777**	0.041
Multiple correlation (** = 0.01 signif.level)	0.94**	0.93**	0.68**	0.70**	0.80**	0.67**
Three dimensions for the sample in Table 1.5	Scope 1	Scope2	NtoAC	AtoNC	CtoAN	NtoA
	(all measured with respect to the 14 regions from Table 1.3)					
Dimension 1 from 3	**-0.965**	**-0.896**	0.051	0.048	-0.094	0.001
Dimension 2 from 3	-0.084	-0.223	0.022	0.462	**-0.465**	0.263
Dimension 3 from 3	0.038	-0.006	**-0.809**	**0.528**	0.249	**-0.784**
Multiple correlation (** = 0.01 signif.level)	0.98**	0.95**	0.81**	0.69**	0.56*	0.81**

Table 1-7: One-way ANOVA for scope mean difference across three intensity levels

Intensity level (ordinal)	**Scope 2** (based on *all* subsidiaries) N	Mean	S.D.
0	597	4.27	2.80
1	301	6.88	3.92
2	154	12.99	6.33
Total	1052	6.29	4.86
Test for variance homogeneity		Levene statistic$_{2,1049}$=103.81 (p-value=0.00)	
F (all multiple comparisons are significant at 0.01 level)		$F_{2,1049}$=324.37 (p-value=0.00)	

Table 1-8: Countries with intensive FDI from 154 high intensity MNEs

Country	MNEs with more than one manufacturing subsidiary	MNEs with more than two manufacturing subsidiaries
China	119	100
Korea	22	11
Taiwan	36	18
Hong Kong	18	6
Singapore	26	17
Thailand	74	53
Malaysia	52	31
Philippines	27	13
Indonesia	60	30
Vietnam	4	-
India	12	6
Pakistan	2	-
Canada	10	2
US	101	84
Mexico	10	5
Brazil	20	8
Venezuela	1	-
UK	22	12
Germany	10	3
Netherlands	7	2
Belgium	4	-
France	9	2
Portugal	1	-
Spain	3	2
Italy	4	1
Czech Republic	1	-
Hungary	2	-
Turkey	1	-
Australia	7	3
Nigeria	1	-

Table 1-9: Comparison between "counts" and "scale" intensity measurements

	Intensity based on scale		
Intensity by counts	Scale below 10%	Scale of 10% or more	Raw total
Category 1: 0	401	23	424
Category 2: 1	**218**	35	253
Category 3: 2	**114**	30	144
Ratio of upper left plus two lower right cells to total		**0.57**	
	Scale below 2%	Scale of 2% or more	
Category 1: 0	231	**193**	424
Category 2: 1	79	174	253
Category 3: 2	27	117	144
Ratio of upper left plus two lower right cells to total		**0.64**	
	Scale below 1%	Scale of 1% or more	
Category 1: 0	149	**275**	424
Category 2: 1	38	215	253
Category 3: 2	11	133	144
Ratio of upper left plus two lower right cells to total		**0.61**	

Table 1-10: Correlations of four principal components, describing the global strategy of 821 firms over five continents, with the regional investment scales, scope, intensity, and overall overseas investment scale of these firms

	PC 1	PC 2	PC 3	PC 4	Asia, incl. Australia, NZ	North America	Central & South America	Europe	rest
Asia, Austral., NZ	**0.29**	**-0.34**	-0.12	0.02	1.00				
North America	0.00	**0.47**	-0.15	0.01	0.18	1.00			
Cent.&South Amer.	**-0.19**	0.00	-0.10	**0.62**	0.11	0.10	1.00		
Europe	**-0.32**	0.14	**0.55**	0.07	0.14	0.28	0.10	1.00	
rest	**-0.22**	-0.01	-0.08	**-0.38**	-0.03	-0.02	0.00	-0.02	1.00
Overseas scale	0.04	0.17	-0.05	0.08	0.65	0.82	0.25	0.50	0.02
Intensity, 2% cutoff	-0.06	0.28	-0.16	0.01	0.41	0.76	0.18	0.27	0.08
Scope (5 regions), 0.2% cutoff	0.05	0.23	0.16	0.16	0.20	0.33	0.24	0.41	0.04

Table 1-11: Correlations of seven principal components, describing the global strategy of 821 firms over twelve regions based on Table 1.3, with the regional investment scales, scope, intensity, and overall overseas investment scale of these firms

	PC 1	PC 2	PC 3	PC 4	PC 5	PC 6	PC 7
China	**-0.16**	**0.33**	**0.50**	**-0.14**	0.05	-0.05	-0.03
ASEAN, incl. India, Pakist.	-0.07	**0.31**	**-0.39**	**-0.25**	0.02	-0.05	-0.01
NIEs	-0.06	**0.22**	-0.07	**0.45**	0.00	-0.10	-0.07
Australia and New Zealand	-0.09	-0.09	0.02	-0.02	-0.05	-0.06	0.04
USA and Canada	**0.47**	**-0.38**	0.01	-0.08	-0.01	**-0.17**	-0.05
Mexico	-0.01	-0.10	-0.01	-0.02	-0.02	-0.05	-0.04
Central & South America	-0.06	-0.05	-0.02	-0.03	-0.06	-0.10	**-0.32**
UK and Ireland	-0.00	**-0.16**	-0.01	-0.02	**0.58**	**0.20**	-0.04
Northern Europe	-0.02	**-0.19**	0.00	0.01	**-0.24**	**0.57**	-0.06
Southern Europe	0.01	**-0.15**	0.05	-0.02	-0.05	0.06	**0.64**
CEE, incl. Turkey	-0.07	-0.00	0.04	-0.01	-0.02	-0.08	-0.04
African and Arab countries	-0.10	-0.05	0.00	-0.01	-0.02	-0.07	-0.05
Overseas scale	0.20	-0.11	0.02	-0.04	0.06	-0.09	-0.07
Intensity, 2% cutoff	0.23	-0.23	0.07	-0.09	0.00	-0.17	-0.08
Scope (12 regions), 0.2% cutoff	0.18	-0.01	0.06	0.01	0.08	0.09	0.07

Table 1-12: Descriptive statistics for MNEs employee number, two alternative dependent variables for scope and eleven independent variables used in the model regressing scope on firm resources

	Mean	Median	S.D.	Min	Max
Employees (non-consolidated)	2803	1146	5765	72	65907
D1.Scope (manufacturing subsid.)	4.46	3	3.79	0	23
D2.Scope (all subsidiaries)	7.16	6	5.08	2	28
1. Ln (total assets in billion yen)	3.30	3.28	1.29	0	6.69
2. Age of first subsidiary at 2002	24.83	25.50	10.38	2.92	60.17
3. Construction	0.06	0	0.23	0	1
4. Food and textiles	0.10	0	0.30	0	1
5. Resource-based and metals	0.10	0	0.30	0	1
6. Machines	0.15	0	0.36	0	1
7. Electronics	0.21	0	0.41	0	1
8. Automobiles	0.10	0	0.30	0	1
9. Precision	0.04	0	0.20	0	1
10. Chemical	0.18	0	0.37	0	1
11. Other	0.06	0	0.23	0	1

	D1	D2	1	2	3	4	5	6	7	8	9	10	11
D1	1.00												
D2	0.83	1.00											
1	0.53	0.61	1.00										
2	0.50	0.61	0.46	1.00									
3	-0.01	-0.07	0.05	-0.04	1.00								
4	-0.03	-0.09	0.09	0.00	-0.08	1.00							
5	0.06	-0.03	0.02	-0.03	-0.08	-0.11	1.00						
6	-0.10	-0.03	-0.13	-0.02	-0.11	-0.14	-0.14	1.00					
7	0.03	0.16	0.03	0.07	-0.13	-0.17	-0.17	-0.22	1.00				
8	0.11	0.00	-0.07	-0.06	-0.08	-0.11	-0.11	-0.14	-0.17	1.00			
9	-0.05	0.07	-0.11	0.04	-0.05	-0.07	-0.07	-0.09	-0.10	-0.07	1.00		
10	0.05	-0.01	0.09	0.05	-0.12	-0.15	-0.16	-0.20	-0.24	-0.16	-0.10	1.00	
11	-0.12	-0.06	-0.02	-0.06	-0.06	-0.08	-0.08	-0.10	-0.13	-0.08	-0.05	-0.12	1.00

Table 1-13: Regression results for the model regressing scope on firm resources

	Model 1: dependent variable D2: scope by all subsidiaries				Model 2: dependent variable D1: scope by manufacturing subsidiaries			
	Coefficient		S.E.	VIF	Coefficient		S.E.	VIF
Constant	-4.27	**	0.48		-2.20	**	0.42	
Ln (total assets)	1.84	**	0.11	1.35	1.13	**	0.10	1.35
Age of first subsidiary	0.19	**	0.01	1.30	0.12	**	0.01	1.30
Construction	-0.82		0.59	1.25	-0.23		0.51	1.25
Food&Textile	-1.37	**	0.49	1.38	-0.73	#	0.43	1.38
Resource-based&Metals	0.20		0.49	1.40	0.59		0.42	1.40
Machines	1.17	**	0.43	1.59	-0.44		0.38	1.59
Electronics	1.86	**	0.40	1.71	-0.06		0.34	1.71
Automobiles	1.61	**	0.49	1.42	1.77	**	0.42	1.42
Precision	3.37	**	0.70	1.20	-0.52		0.60	1.20
Rest	-0.01		0.60	1.24	-1.48	**	0.52	1.24
R^2	0.56				0.40			
Adjusted R^2	0.55				0.39			
$F_{10,746}$	93.68**				50.12**			
Sample size	757				757			

** p<0.01, * p<0.05, # p<0.1

Table 1-14: Descriptive statistics for the 28 regions from Table 1.2

	Region name	Population million 2000[a]	Distance from Japan thous km[b]	MNEs characteristics			Transaction characteristics [c]				motivation					
				number	average age of first subs.	average size	average scope	average age	joint venture ratio	manufacturing ratio	A	B	C	D	E	F
1	China	1,264	2.1	524	25.8	33.3	14.1	7.7	0.62	0.85	4	7	1	3	1	1
2	Korea	47.3	1.2	256	27.7	37.0	16.4	16.4	0.72	0.73	3	5	1	1	0	1
3	Taiwan	22.2	2.1	411	28.0	33.3	15.2	19.6	0.59	0.67	3	5	1	1	0	1
4	Hong Kong	7.1	2.9	373	28.2	38.2	15.0	15.2	0.16	0.28	3	5	1	1	0	1
5	Singapore	4.2	5.3	401	28.4	36.1	15.7	18.0	0.19	0.38	3	5	1	1	0	1
6	Thailand	62.4	4.6	436	27.0	34.7	15.0	13.1	0.53	0.77	4	6	0	2	0	2
7	Malaysia	21.8	5.3	308	27.9	39.8	17.2	14.3	0.38	0.76	4	6	1	1	1	3
8	Philippines	79.7	3.0	186	29.0	49.0	19.3	11.3	0.40	0.77	4	6	0	2	0	2
9	Indonesia	210.9	5.8	268	28.7	41.0	17.5	12.8	0.56	0.91	4	6	0	2	0	2
10	Vietnam	78.5	3.7	80	30.0	54.4	21.7	5.9	0.48	0.90	4	6	0	1	0	2
11	India,Pakistan,S.Lanka	1,167	5.8	102	30.1	53.2	21.8	11.2	0.68	0.88	2	5	1	1	0	1
12	rest of Asia	218.1	8.7	52	33.5	78.4	24.9	13.4	0.79	0.49	2	5	1	1	0	2
13	Canada	31.3	10.0	154	31.1	52.2	19.5	13.1	0.14	0.38	1	5	1	1	2	1
14	US	282.3	11.0	966	24.0	24.2	10.6	13.3	0.14	0.47	1	6	2	1	0	0
15	Mexico	100.4	11.0	126	30.3	47.8	21.0	12.5	0.10	0.68	4	6	1	0	1	2
16	Brazil	175.6	18.0	158	33.9	47.4	20.1	22.5	0.21	0.59	3	3	0	0	2	2
17	restCentral/SouthAmer	145.3	18.0	79	34.2	76.1	22.8	21.3	0.33	0.36	1	1	0	0	1	3
18	Scandinav. countries	22.8	8.2	59	33.3	63.4	24.2	13.1	0.20	0.20	0	7	2	0	0	0
19	Germany,Austria,Swit	97.5	9.4	354	29.2	36.0	15.3	14.5	0.13	0.20	0	7	2	0	0	0
20	Netherlands	15.9	9.3	181	31.0	51.0	18.8	12.7	0.18	0.20	0	7	2	0	0	0
21	Belgium, Luxemburg	10.8	9.5	93	31.7	50.4	21.1	16.3	0.18	0.38	0	7	2	0	0	0
22	UK and Ireland	62.9	9.6	354	28.4	38.0	16.1	12.1	0.14	0.41	2	6	1	0	0	2
23	France	59.4	9.7	195	31.0	46.1	18.4	13.1	0.30	0.35	1	7	2	0	0	1
24	Spain and Portugal	50.0	11.0	107	32.6	60.6	23.4	15.7	0.27	0.41	1	7	2	0	0	1
25	Italy and Greece	68.3	9.9	120	32.6	54.7	22.0	12.9	0.29	0.33	1	7	2	1	0	1
26	CentralEastern Europe	135.1	9.1	74	31.2	49.6	24.3	6.6	0.25	0.45	3	8	1	1	0	1
27	Australia,New Zealand	22.9	8.0	184	31.7	54.7	19.6	15.1	0.18	0.28	0	3	1	1	4	1
28	rest Africa & Oceania	167.1	15.0	58	32.3	74.2	22.6	16.2	0.54	0.44	3	3	1	0	1	3
	All regions [d]	-	-	1052	28.4	40.3	16.4	13.1	0.39	0.55	3	6	1	2	1	1

[a] For regions with more than one country, population total over countries with at least six Japanese investors .

[b] Distances between capitals. For regions with more than one country the capital of the country with the greatest concentration of Japanese MNEs used, i.e. India, UAE, Argentina, Sweden, Germany, Belgium, UK, Spain, Italy, Hungary, Australia, and South Africa in the order of occurrence in column 1.

[c] Firm size is assets in billions of yen. Average age of subsidiaries per country, joint venture ratios and motivation data are for manufacturing subsidiaries only. Joint venture ratio is the number of joint ventures divided to all manufacturing subsidiaries. Motivation has six categories: A-use of labor force, B-creation of overseas production network, C-creation of overseas distribution network, D-exporting to Japan, E-natural resources, F-local government incentives. Values are in deciles percentage from total response. The motivation "local market" is not shown, because it is of universal and similar importance for all regions, with values between 70% and 80% of the respondents (45% for regions 15 and 27). Response rate is 60%.

[d] Number of MNEs does not add to 1052 because MNE region scope is bigger than 1.

Source: Maddison, 2003; Toyo Keizai Inc., 2003.

Table 1-15: One-way ANOVA results with mean distance from Japan (of the 28 regions from Table 1.2 without China and US) as dependent, and time of first investment as independent variables, accounting for firm size (757 total available data)

Time of first subsidiary	Small firm size			Moderate firm size		
(any industry)	N	Mean	S.D.	N	Mean	S.D.
1 (1991-2000)	57	4.82	3.33	11	6.76	2.07
2 (1981-1990)	179	5.94	2.69	78	6.31	2.01
3 (1971-1980)	113	6.77	3.10	109	6.67	1.91
4 (before 1971)	59	6.68	2.10	132	7.05	1.67
Total	408	6.12	2.89	330	6.74	1.86
Test for variance homogeneity	Levene statistic$_{3,404}$=1.91 (p-value=0.13)			Levene statistic$_{3,326}$=1.31 (p-value=0.27)		
F	$F_{3,404}$=7.01 (p-value=0.00)			$F_{3,326}$=2.71 (p-value=0.04)		

Table 1-16: One-way ANOVA results with absolute value of deviations from the mean of the ASEAN presence divided to Asia presence as dependent, and time of first investment as independent variables, accounting for firm size (719 total available data)

Time of first subsidiary	Small firm size			Moderate and big firm size		
(any industry)	N	Mean	S.D.	N	Mean	S.D.
1 (1991-2000)	53	1.12	0.62	8	1.07	0.64
2 (1981-1990)	159	1.12	0.68	76	0.71	0.53
3 (1971-1980)	104	0.80	0.55	110	0.56	0.48
4 (before 1971)	55	0.86	0.69	154	0.49	0.40
Total	371	0.99	0.66	348	0.57	0.48
Test for variance homogeneity	Levene statistic$_{3,367}$=1.57 (p-value=0.20)			Levene statistic$_{3,344}$=3.86 (p-value=0.01)		
F	$F_{3,367}$=6.70 (p-value=0.00)			$F_{3,344}$=7.22 (p-value=0.00)		

Table 1-17: Chi-square test of independence between industry and intensity

Observed	Constr uction	Food	Tex- tile	Che- mical	Resource -based	Machine	Elect- ronic	Cars	Presici- sion	Other	frequency
0	29	23	18	90	56	115	128	52	27	56	594
1	14	21	15	71	34	36	52	41	7	13	304
2	3	9	16	28	22	10	32	24	4	6	154
Frequency	46	53	49	189	112	161	212	117	38	75	1052
Expected											
0	26	30	28	107	63	91	120	66	21	42	0.56
1	13	15	14	55	32	47	61	34	11	22	0.29
2	7	8	7	28	16	24	31	17	6	11	0.15
Frequency	0.04	0.05	0.05	0.18	0.11	0.15	0.20	0.11	0.04	0.07	1.00
Deviations											
0	3.0	-6.9	-9.7	-16.7	-7.2	24.1	8.3	-14.1	5.5	13.7	
1	0.7	5.7	0.8	16.4	1.6	-10.5	-9.3	7.2	-4.0	-8.7	
2	-3.7	1.2	8.8	0.3	5.6	-13.6	1.0	6.9	-1.6	-5.0	
Scaled deviations											
0	0.4	1.6	3.4	2.6	0.8	6.4	0.6	3.0	1.4	4.4	
1	0.0	2.1	0.0	4.9	0.1	2.4	1.4	1.5	1.4	3.5	
2	2.1	0.2	10.9	0.0	1.9	7.8	0.0	2.8	0.4	2.3	
Total	2.5	3.9	14.3	7.5	2.8	16.6	2.0	7.3	3.3	10.1	
Chi-square (18 d.f.) =70.3 (p-value=0.000)											

Table 2-1: Descriptive statistics for 405 Japanese parent firms (consolidated)

Parent characteristic	Mean	Median	s.d.	Min	Max
Number of foreign manufacturing subsidiaries in world as a parent [a]	10.68	8	13.92	1	144
Number of countries invested in as a parent [a]	9.66	6	7.71	1	47
Number of continents invested in as a parent [a]	3.37	3	1.13	1	6
Number of manufacturing subsidiaries in Europe	1.95	1	1.98	1	18
Number of employees (for 332 firms)	16,545	5,260	36,748	120	328,562
Total equity in millions of dollars	2,004	695	4,749	2	60,295
ROA (for 281 firms)	0.56	0.77	2.96	-15.44	10.65

[a] The numbers for parents as *main* are almost the same if only manufacturing parents are considered for main parents (ignoring Sogo Shosha). All data are as of the end of 2001.

Source: Toyo Keizai Inc., 2001 and 2003.

Table 2-2: Entry mode according to region

	Region number and name [a, b]	Population '95 (mln)	Average '95 GDP per capita in US$	Firms with non-greenfield mode (NG)		All firms (A)	NG/A Ratio
				joint venture	full acquisition		
1	U.K. and Ireland	62.7	17,500	49	47	251	0.38
2	France	58.8	22,950	42	17	96	0.61
3	Belgium, Luxemburg	10.6	22,515	8	7	43	0.35
4	Spain, Portugal	49.1	11,050	36	7	62	0.69
5	Italy, Greece	67.9	17,800	24	8	49	0.64
6	CEE	87.0	5,000	18	5	53	0.43
7.1	Germany, Austria, Switzerland	97.1	25,100	30	23	119	0.45
7.2	Sweden, Finland, Denmark	19.1	22,400	8	6	22	0.64
7.3	Netherlands	15.7	21,733	14	13	56	0.48
	All European countries	468.0	19,680	229	133	751	0.48

[a] Region 1 has only 15 firms located in Ireland. Region 3 has only 2 firms in Luxemburg. Region 4 has 15 firms in Portugal. Region 5 has only 3 firms in Greece. The CEE region includes Poland, the Czech Republic and Hungary (46 firms) as well as the Slovak Republic and Romania (7 firms). Region 7.1 has only 5 firms in Austria and 4 firms in Switzerland; therefore it reflects the entry mode for German subsidiaries. Region 7.2 has 14 firms in Sweden.

[b] Region 7.1, 7.2 and 7.3 are combined in the regression as region 7, called for brevity Germany-Netherlands-Sweden. With regards to these final seven regions chi-square equals 37, $p<0.001$.

Source: Toyo Keizai Inc., 2003 and OECD, 1997.

Table 2-3: Variable operationalization

Main explanatory variables and their measurement		Factor being measured
Labor cost	Employee remuneration in the host country divided to the European average for the respective industry at time of entry	Cost effects
Market size	Three categories for low, medium and high relative value added share (in OECD 15) of the host country for each industry at time of entry	Market size
Host competitiveness	A dummy set to one when the ratio of host R&D intensity to European average R&D intensity, for each industry at time of entry, is bigger than 1.25	Relative competitiveness of host domestic firms
Industry growth	Average growth rate in the respective industry for UK, Germany, France, Italy at time of entry	Profit opportunity
CEE, UK, etc.	Dummy for culture type	Differences in culture
Control variables and their measurement		Factor being measured
International inexperience	Dummy set to one if the number of continents a parent has invested in, irrespective of industry, equals one at time of entry.	International standing/experience at the time of entry
Subsidiary number	Number of subsidiaries of a parent in the world in the respective industry at time of entry	MNE industrial experience at the time of entry
Subsequent entry	Dummy set to one if a parent has already invested in any manufacturing industry in the same country, at time of entry.	Host experience at the time of entry
Second parent	Dummy for presence of more than one Japanese parent at the time of entry	Mainly the effect of Sogo Shosha at the time of entry
Time Trend	Three categories for time of investment	Time effects

Table 2-4: Descriptive statistics based on the full sample (N=751)

	Variable	Mean	Median	S. D.	Min.	Max.
(1)	Joint venture	0.30	0.00	0.46	0.00	1.00
(2)	Full acquisition	0.18	0.00	0.38	0.00	1.00
(3)	Subsidiary number	7.18	4.00	11.02	1.00	119.00
(4)	International inexperience	0.11	0.00	0.32	0.00	1.00
(5)	Subsequent entry	0.14	0.00	0.35	0.00	1.00
(6)	Second parent	0.11	0.00	0.32	0.00	1.00
(7)	1993-2002	0.36	0.00	0.48	0.00	1.00
(8)	1987-1992	0.41	0.00	0.49	0.00	1.00
(9)	1969-1986	0.23	0.00	0.42	0.00	1.00
(10)	Labor cost	0.97	0.97	0.27	0.20	1.59
(11)	Small market size	0.43	0.00	0.50	0.00	1.00
(12)	Medium market size	0.36	0.00	0.48	0.00	1.00
(13)	Large market size	0.21	0.00	0.41	0.00	1.00
(14)	Host competitiveness (missing 61 cases)	0.24	0.00	0.43	0.00	1.00
(15)	Industry growth	3.10	3.23	3.03	-6.24	11.27
(16)	UK/Ireland	0.33	0.00	0.47	0.00	1.00
(17)	France	0.13	0.00	0.34	0.00	1.00
(18)	Germany/Sweden/Netherlands	0.26	0.00	0.44	0.00	1.00
(19)	Belgium/Luxemburg	0.06	0.00	0.23	0.00	1.00
(20)	Spain/Portugal	0.08	0.00	0.28	0.00	1.00
(21)	Italy/Greece	0.07	0.00	0.25	0.00	1.00
(22)	CEE	0.07	0.00	0.26	0.00	1.00
(23)	Traditional industries (food, textiles)	0.11	0.00	0.32	0.00	1.00
(24)	Construction industry	0.04	0.00	0.20	0.00	1.00
(25)	Resource-based industries	0.04	0.00	0.20	0.00	1.00
(26)	Chemical industry	0.14	0.00	0.35	0.00	1.00
(27)	Pharmaceutical industry	0.06	0.00	0.23	0.00	1.00
(28)	Machinery	0.13	0.00	0.34	0.00	1.00
(29)	Electronic industries	0.30	0.00	0.46	0.00	1.00
(30)	Automobiles	0.18	0.00	0.38	0.00	1.00

Table 2-5: Zero-order correlations (without intra-industry correlations)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
(1)	1.00																					
(2)	-0.31	1.00																				
(3)	-0.03	-0.07	1.00																			
(4)	-0.01	0.07	-0.19	1.00																		
(5)	0.02	0.09	0.27	-0.12	1.00																	
(6)	0.07	-0.09	-0.12	0.14	-0.06	1.00																
(7)	0.00	0.03	0.20	-0.18	0.11	-0.08	1.00															
(8)	0.00	0.08	-0.13	0.02	0.01	0.05	-0.63	1.00														
(9)	0.00	-0.12	-0.08	0.19	-0.14	0.03	-0.41	-0.45	1.00													
(10)	0.01	0.08	-0.17	0.10	-0.01	-0.09	-0.17	0.06	0.12	1.00												
(11)	0.04	0.00	0.08	-0.07	-0.09	0.05	0.16	-0.12	-0.05	-0.14	1.00											
(12)	-0.01	-0.06	-0.06	0.03	0.04	0.00	-0.06	0.11	-0.06	-0.13	-0.65	1.00										
(13)	-0.04	0.08	-0.03	0.05	0.05	-0.06	-0.13	0.02	0.13	0.32	-0.45	-0.39	1.00									
(14)	-0.02	0.08	-0.10	0.08	-0.06	0.02	-0.07	0.03	0.05	0.21	0.03	-0.07	0.04	1.00								
(15)	-0.11	-0.06	0.02	-0.02	0.03	-0.01	-0.20	0.22	-0.03	-0.06	-0.02	0.12	-0.11	-0.12	1.00							
(16)	-0.17	0.02	-0.04	-0.03	0.09	0.00	-0.03	0.11	-0.09	-0.39	-0.29	0.51	-0.24	0.00	0.10	1.00						
(17)	0.11	0.00	-0.06	0.04	-0.03	-0.07	-0.01	-0.01	0.03	0.27	-0.22	0.27	-0.04	0.04	-0.03	-0.27	1.00					
(18)	-0.05	0.06	-0.06	0.08	0.03	-0.02	-0.05	-0.02	0.08	0.54	0.01	-0.41	0.47	0.13	-0.05	-0.42	-0.23	1.00				
(19)	-0.06	-0.01	-0.06	-0.01	-0.03	-0.02	-0.07	0.02	0.06	0.25	0.28	-0.18	-0.13	0.03	0.02	-0.17	-0.09	-0.15	1.00			
(20)	0.18	-0.05	-0.01	-0.01	-0.03	0.05	-0.10	0.02	0.09	-0.20	0.31	-0.19	-0.15	-0.15	0.04	-0.21	-0.12	-0.18	-0.07	1.00		
(21)	0.10	-0.01	0.04	-0.04	-0.03	0.02	0.02	-0.02	-0.01	-0.05	-0.10	0.01	0.11	-0.09	-0.08	-0.19	-0.10	-0.16	-0.07	-0.08	1.00	
(22)	0.02	-0.06	0.27	-0.06	-0.08	0.08	0.29	-0.16	-0.14	-0.53	0.32	-0.21	-0.14	-0.10	-0.04	-0.19	-0.11	-0.16	-0.07	-0.08	-0.07	1.00
(23)	-0.04	0.05	0.06	0.07	-0.02	-0.03	-0.09	-0.05	0.15	0.07	-0.09	-0.14	0.27	0.05	-0.29	-0.07	0.09	0.02	0.00	-0.03	0.06	-0.03
(24)	-0.11	-0.01	-0.01	-0.07	-0.03	-0.05	-0.02	-0.02	0.05	-0.01	-0.02	0.03	-0.01	-0.05	-0.11	0.02	-0.06	0.03	0.01	-0.04	-0.06	0.07
(25)	-0.01	0.00	-0.08	0.11	-0.03	0.13	-0.08	0.02	0.07	0.01	0.10	-0.09	-0.01	-0.01	-0.11	-0.07	-0.02	0.08	0.06	-0.02	-0.03	0.02
(26)	0.05	-0.05	-0.11	0.16	-0.04	0.13	-0.03	0.01	0.02	0.08	0.02	0.06	-0.10	0.10	-0.04	-0.08	0.04	0.00	0.08	0.06	0.01	-0.05
(27)	-0.03	0.08	-0.05	-0.03	0.03	-0.07	0.05	0.02	-0.08	0.08	-0.02	-0.05	0.09	0.00	-0.07	-0.05	-0.01	0.08	0.04	-0.03	0.03	-0.07
(28)	0.03	0.05	-0.14	0.01	-0.02	-0.04	0.00	0.01	-0.01	0.13	-0.10	-0.02	0.15	0.11	-0.24	-0.04	-0.03	0.12	-0.03	-0.05	0.08	-0.09
(29)	-0.19	-0.01	0.13	-0.07	0.04	-0.09	-0.03	0.05	-0.02	-0.14	-0.05	0.13	-0.09	-0.10	0.54	0.16	-0.02	-0.04	-0.06	-0.08	-0.08	0.03
(30)	0.27	-0.09	0.10	-0.13	0.04	0.06	0.16	-0.05	-0.13	-0.13	0.18	-0.01	-0.20	-0.07	0.01	0.04	-0.01	-0.18	-0.04	0.15	-0.01	0.12

Table 2-6: Multinomial logistic regression results (with wholly owned greenfield mode as a base)

Variable	Joint venture		Full acquisition		Likelihood ratio	
Location factors	Coefficient	S.E.	Coefficient	S.E.	Chi-square	
Labor cost	0.57	0.78	1.12	0.92	1.59	
Market size (small)	-0.23	0.30	0.59 *	0.31	6.03	
Market size (large)	-0.19	0.33	0.50	0.36		
Host competitiveness	0.23	0.24	0.46 #	0.25	3.37	
Industry growth	-0.11 **	0.03	-0.09 *	0.04	11.12	**
UK/Ireland	-0.68	0.45	0.35	0.49		
France	0.54	0.36	0.37	0.40		
Belgium/Luxemburg	-0.84 #	0.52	-0.45	0.51	54.31	**
Spain/Portugal	1.50 **	0.51	1.15 *	0.62		
Italy/Greece	1.25 **	0.47	1.01 #	0.58		
CEE	0.05	0.86	0.33	1.11		
Controls						
Subsidiary number	-0.03 *	0.01	-0.04 *	0.02	10.46	**
International inexperience	0.18	0.33	0.82 *	0.34	5.59	#
Subsequent entry	0.72 *	0.31	1.03 **	0.32	12.09	**
Second parent	-0.18	0.32	-0.92 *	0.45	4.87	#
1969-1986	-0.34	0.26	-1.29 **	0.33	18.60	**
1993-2002	-0.25	0.25	-0.16	0.26		
Chemicals	0.05	0.28	-0.57 #	0.35	49.72	**
Automobiles	1.75 **	0.28	0.18	0.36		
Constant	-0.62	1.07	-1.76	1.25	0.00	
Null deviance (intercept only)	1385.26					
Residual deviance	1209.22				176.04	**
Pseudo R-square	0.23 (Cox and Snell), 0.26 (Nagelkerke), 0.13 (McFadden)					
Sample size	690 (due to 61 missing data on business R&D)					

# p<0.1, * p<0.05, ** p<0.01

Table 2-7: Multinomial logistic regression results: country comparison

Base categories [a]	Joint venture (vs. WOG)		Full acquisition (vs. WOG)		Joint venture (vs. FA)	
Germany&Sweden& Netherlands as base	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
UK/Ireland	-0.68	0.45	0.35	0.49	-1.05 *	0.54
France	0.54	0.36	0.37	0.40	0.15	0.43
Belgium/Luxemburg	-0.84 #	0.52	-0.45	0.51	-0.36	0.63
Spain/Portugal	1.50 **	0.51	1.15 *	0.62	0.40	0.63
Italy/Greece	1.25 **	0.47	1.01 #	0.58	0.26	0.57
CEE	0.05	0.86	0.33	1.11	-0.25	1.20
UK&Ireland as base						
France	1.23 **	0.39	0.03	0.48	1.20 *	0.51
Germany/Swed/Nether.	0.68	0.45	-0.35	0.49	1.05 *	0.54
Belgium/Luxemburg	-0.16	0.63	-0.85	0.67	0.69	0.78
Spain/Portugal	2.19 **	0.48	0.74	0.58	1.45 *	0.57
Italy/Greece	1.94 **	0.42	0.63	0.52	1.30 *	0.51
CEE	0.73	0.70	-0.07	0.92	0.80	1.01
Belgium/Lux. as base						
UK/Ireland	0.16	0.63	0.85	0.67	-0.69	0.78
France	1.39 *	0.57	0.88	0.59	0.51	0.69
Germany/Swed/Nether.	0.84 #	0.52	0.45	0.51	0.36	0.63
Spain/Portugal	2.35 **	0.64	1.59 *	0.74	0.76	0.80
Italy/Greece	2.10 **	0.67	1.48 *	0.75	0.62	0.81
CEE	0.89	0.97	0.78	1.21	0.11	1.33
France as base						
UK/Ireland	-1.23 **	0.39	-0.03	0.48	-1.20 *	0.51
Germany/Swed/Nether.	-0.54	0.36	-0.37	0.40	-0.15	0.43
Belgium/Luxemburg	-1.39 *	0.57	-0.88	0.59	-0.51	0.69
Spain/Portugal	0.96 #	0.53	0.71	0.66	0.25	0.66
Italy/Greece	0.71	0.47	0.61	0.60	0.10	0.59
CEE	-0.50	0.85	-0.10	1.11	-0.40	1.20
Spain/Portug. as base						
UK/Ireland	-2.19 **	0.48	-0.74	0.58	-1.45 *	0.57
France	-0.96 #	0.53	-0.71	0.66	-0.25	0.66
Germany/Swed/Nether.	-1.50 **	0.51	-1.15 *	0.62	-0.40	0.63
Belgium/Luxemburg	-2.35 **	0.64	-1.59 *	0.74	-0.76	0.80
Italy/Greece	-0.25	0.55	-0.11	0.70	-0.14	0.66
CEE	-1.46 #	0.98	-0.81	1.04	-0.65	1.09
Italy/Greece as base						
UK/Ireland	-1.94 **	0.42	-0.63	0.52	-1.30 *	0.51
France	-0.71	0.47	-0.61	0.60	-0.10	0.59
Germany/Swed/Nether.	-1.25 **	0.47	-1.01 #	0.58	-0.26	0.57
Belgium/Luxemburg	-2.10 **	0.67	-1.48 *	0.75	-0.62	0.81
Spain/Portugal	0.25	0.55	0.11	0.70	0.14	0.66
CEE	-1.21	0.78	-0.70	1.04	-0.51	1.11

[a] This table shows only a part of regression results, which refers to the nominal variable for cultural type. The remaining variable coefficients are shown in Table 2.6 and do not change when base categories are changed. WOG stands for wholly-owned greenfield entry mode. It is the base category of the dependent variable for the first two columns. FA stands for full acquisition and is the base category for the dependent variable in the last column. The data in this table are summarized in Figure 2.1 (except for CEE, which is close to the position of Germany/Sweden/Netherlands in Figure 2.1).

# $p<0.1$, * $p<0.05$, ** $p<0.01$

Table 2-8: Entry mode profiles (contribution to deviance in parentheses)

Location factors	Full acquisitions	Joint ventures	Wholly owned greenfields
Host competitiveness (3.4)	High	Any level	Low
Market size (6)	Small and Large	Medium	Medium
Industry growth (11)	Low	Low	High
Region (54)	None particularly	Southern incl. France	Northern incl. CEE
Employee number (36)	High	Low	Low
Strategic context			
Subsidiary number (10)	Low	Low	High
International experience (6)	Low (only Europe)	High	High
Subsequent entry (12)	Yes	Yes	No
Second parent (5)	* No	Yes	Yes
Time trend (19)	After '86	Before '86, after '92	Before '86, after '92
Industry (50)	* Not in chemical	Automobiles	None particularly

Note: Contribution to deviance diverges slightly from the given value with change of the basis mode
* This effect is stronger when capital participations are combined with full acquisitions.

Table 3-1: Descriptive statistics for profitability analysis (N=740)

	Mean	Median	Standard Deviation	Minimum	Maximum
Intangibles	2.44	1.00	2.59	1	8
Scope	0.26	0.21	0.18	0.07	0.96
Intensity	3.21	2.59	3.97	0	25.9
Age of first manufact. subsidiary	20.52	19.21	11.56	0	54.25
Network average age	10.98	10.86	4.36	0	28.36
In China	0.54	1.00	0.50	0	1
In China, Thailand or Indonesia	0.75	1.00	0.43	0	1
PC 3 from Table 1.11 (in China)	0.00	0.00	0.35	-0.68	0.82
PC 1 from Table 1.11 (in USA)	0.56	0.67	0.36	-0.18	0.99
Developing/all	0.46	0.50	0.20	0	1
Culture distance	72.82	73.13	5.32	45.75	94.33
Market size	2732.36	2518.98	1265.15	127.16	7647.33
Market growth	0.05	0.05	0.01	0.004	0.076
Partner reliance	0.20	0.09	0.26	0	1
Keiretsu-related suppliers	0.15	0.00	0.36	0	1
Keiretsu-related clients	0.003	0.00	0.35	0	1
Firm size	10.65	10.46	1.42	6.76	15.33
Food&Textiles	0.10	0.00	0.30	0	1
Automobile	0.11	0.00	0.31	0	1
Electronic&Precision	0.24	0.00	0.43	0	1
Machines	0.16	0.00	0.36	0	1
Remaining	0.40	0.00	0.49	0	1

Table 3-2: Correlations for profitability (without intra-industry/keiretsu correlations)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
1. ROA	1.00															
2. Intangibles	0.08	1.00														
3. Scope	0.05	0.17	1.00													
4. Intensity	-0.02	0.10	0.20	1.00												
5. Age of first manufact. subsid.	-0.03	0.00	0.57	0.12	1.00											
6. Network average age	-0.12	-0.02	0.37	-0.01	0.52	1.00										
7. In China	0.03	0.10	0.46	0.14	0.29	0.05	1.00									
8. In China, or Thai., Indonesia	-0.06	0.01	0.38	0.13	0.37	0.10	0.63	1.00								
9. PC 3	-0.01	0.04	0.01	0.06	-0.09	-0.12	0.46	0.16	1.00							
10. PC 1	0.05	0.05	0.16	0.26	0.08	0.10	-0.06	-0.04	-0.00	1.00						
11. Developing/all	-0.07	-0.05	0.14	0.05	0.29	-0.07	0.32	0.49	-0.09	-0.10	1.00					
12. Cultural distance	-0.06	0.03	-0.10	-0.04	-0.08	-0.05	0.04	0.08	-0.06	-0.03	-0.14	1.00				
13. Market size	0.00	-0.07	-0.40	0.05	-0.32	-0.27	-0.04	-0.18	0.31	0.23	-0.16	0.01	1.00			
14. Market growth	0.07	-0.04	-0.01	-0.04	0.01	-0.09	0.19	0.12	0.07	-0.06	0.18	0.38	-0.15	1.00		
15. Partner reliance	-0.16	-0.11	-0.17	-0.02	0.03	-0.09	0.02	0.14	-0.03	-0.09	0.26	0.01	0.02	-0.10	1.00	
16. Firm size	-0.10	0.10	0.65	0.09	0.49	0.30	0.35	0.32	0.03	0.11	0.13	-0.04	-0.19	-0.13	0.08	1.00
17. Keiretsu supplier	-0.07	-0.07	-0.01	0.12	-0.06	-0.13	0.01	0.07	-0.02	0.04	0.08	-0.01	-0.01	-0.02	0.11	-0.01
18. Keiretsu client	-0.07	-0.01	0.38	0.04	0.29	0.13	0.18	0.14	-0.04	0.12	0.05	0.04	-0.09	-0.01	0.04	0.41
Food&Textiles	-0.07	-0.04	-0.10	-0.15	0.04	-0.01	0.13	0.11	0.13	-0.12	0.07	-0.01	0.02	0.01	0.20	0.11
Automobile	-0.03	-0.12	0.01	0.16	0.01	-0.06	0.02	0.08	0.01	0.13	0.12	-0.01	0.09	-0.09	0.09	0.04
Electronic & Precision	0.11	0.13	0.19	0.04	-0.02	0.03	0.07	-0.05	-0.00	0.02	-0.15	-0.01	-0.14	0.12	-0.28	-0.13
Machines	0.00	-0.06	-0.03	-0.01	-0.10	0.04	-0.12	-0.06	0.00	0.02	-0.10	-0.06	0.02	-0.03	-0.09	-0.19
Remaining	-0.03	0.03	-0.09	-0.04	0.06	-0.01	-0.06	-0.04	-0.09	-0.04	0.09	0.07	0.04	-0.03	0.13	0.16

Table 3-3: Results for profitability

A. Results for ROA as dependent variable (N=740)

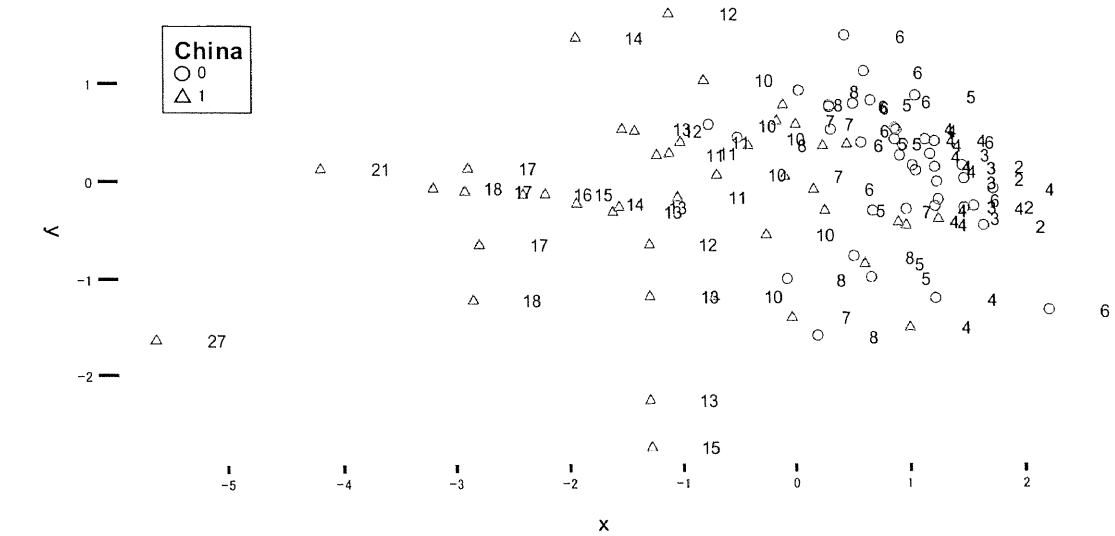
	model ROA			
Main variables	Coefficient	S. E.	Sig.	VIF
(Constant)	0.13 **	0.03	0.00	
scope	0.05 **	0.01	0.00	2.33
intensity	-0.001	0.00	0.40	1.15
developing/all	-0.02 *	0.01	0.02	1.30
cultural distance	-0.001 *	0.00	0.01	1.28
Control variables				
market growth	0.51 *	0.23	0.02	1.35
partner reliance	-0.01 *	0.01	0.05	1.26
network average age	-0.002 **	0.00	0.00	1.26
intangibles	0.002	0.00	0.30	1.08
PC 1 (in USA)	0.01	0.00	0.12	1.11
PC 3 (in China)	-0.01	0.00	0.13	1.07
keiretsu suppliers	-0.01 *	0.00	0.04	1.08
keiretsu clients	-0.02 *	0.01	0.05	1.29
firm size	-0.004 **	0.00	0.01	2.05
	$R=0.30$, $R^2=0.09$, $F_{13,726}=5.71$**			

B. Results for surveyed performance data as dependent variable (N=617)

	model of surveyed performance (a)				model of surveyed performance (b)			
Main variables	Coefficient	S. E.	Sig.	VIF	Coefficient	S. E.	Sig.	VIF
(Constant)	1.76 **	0.34	0.00		1.78 **	0.33	0.00	
scope	-0.23	0.16	0.15	2.38	-0.23	0.16	0.15	2.38
intensity	0.02	0.02	0.28	1.16	0.02	0.02	0.42	1.18
developing/all	0.27 *	0.11	0.02	1.26	0.24 *	0.11	0.03	1.28
cultural distance	0.01	0.00	0.17	1.29	0.005	0.00	0.23	1.29
Control variables								
market growth	-6.31 *	2.63	0.02	1.34	-5.54 *	2.64	0.04	1.36
partner reliance	0.11	0.08	0.17	1.23	0.12	0.08	0.16	1.23
network average age	-0.01 #	0.01	0.08	1.26	-0.01 #	0.01	0.10	1.26
intangibles	-0.02	0.03	0.41	1.08	-0.01	0.03	0.61	1.09
PC 1 (in USA)	-0.003	0.06	0.95	1.12	-0.02	0.06	0.76	1.13
PC 3 (in China)	-0.01	0.06	0.86	1.08	-0.02	0.06	0.77	1.08
keiretsu suppliers	0.04	0.05	0.44	1.08	0.01	0.06	0.85	1.15
keiretsu clients	0.07	0.09	0.45	1.31	0.07	0.09	0.44	1.31
firm size	-0.03	0.02	0.11	2.08	-0.03	0.02	0.11	2.08
Automobiles					0.15 *	0.07	0.02	1.18
	$R=0.26$, $R^2=0.07$, $F_{13,603}=3.35$**				$R=0.27$, $R^2=0.08$, $F_{14,602}=3.49$**			

FIGURES

Figure 1-1: MDS result (2 dimensions) for a random sample (N=100) from 1052 MNEs with labels for network scope 1 and symbol style indicating presence in China (upper graph), and labels for network scope 2 and symbol style indicating presence in ASEAN (lower graph)



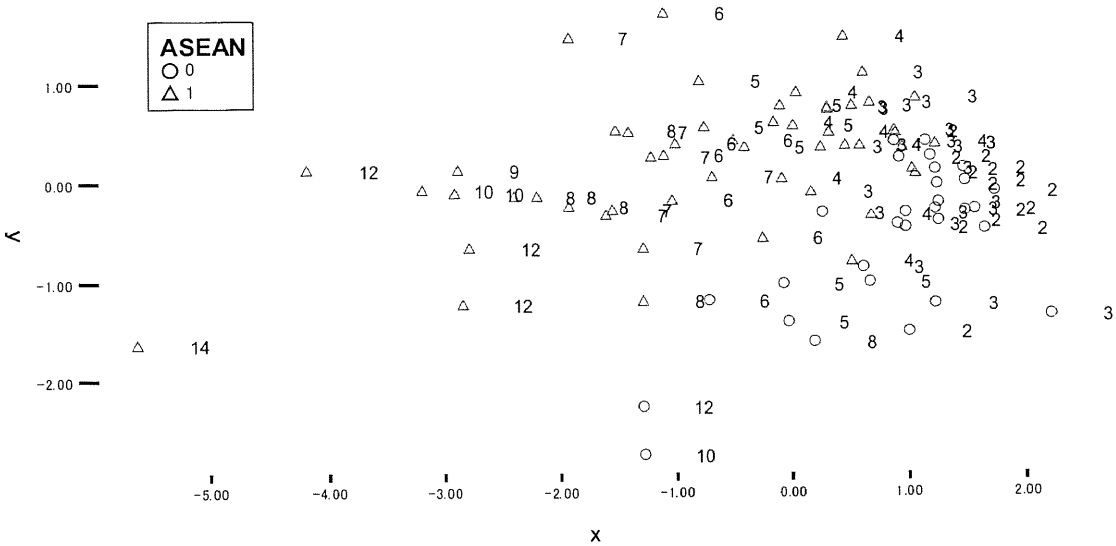
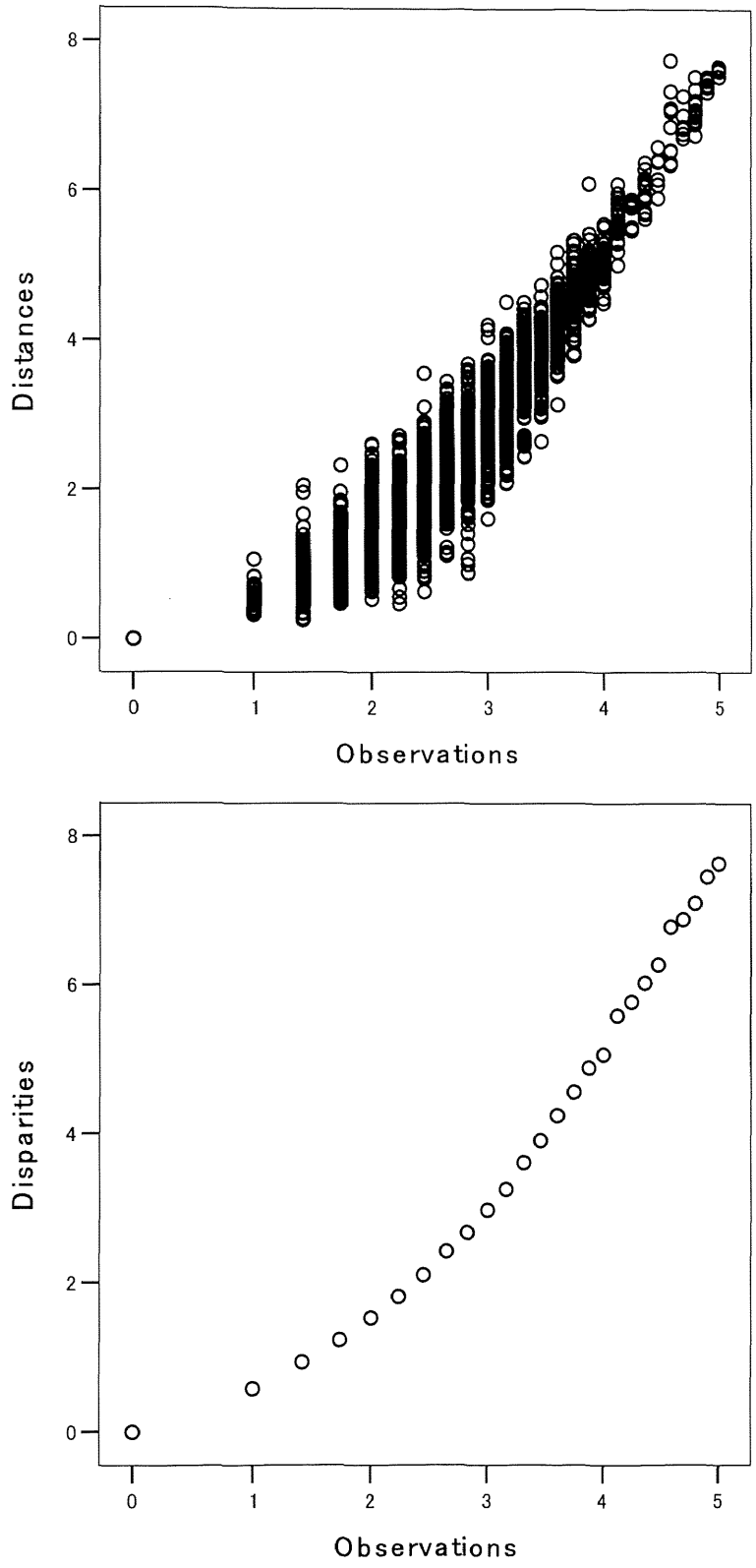


Figure 1-2: Shepard diagram, transformation and scatter plots for the sample of Figure 1.1



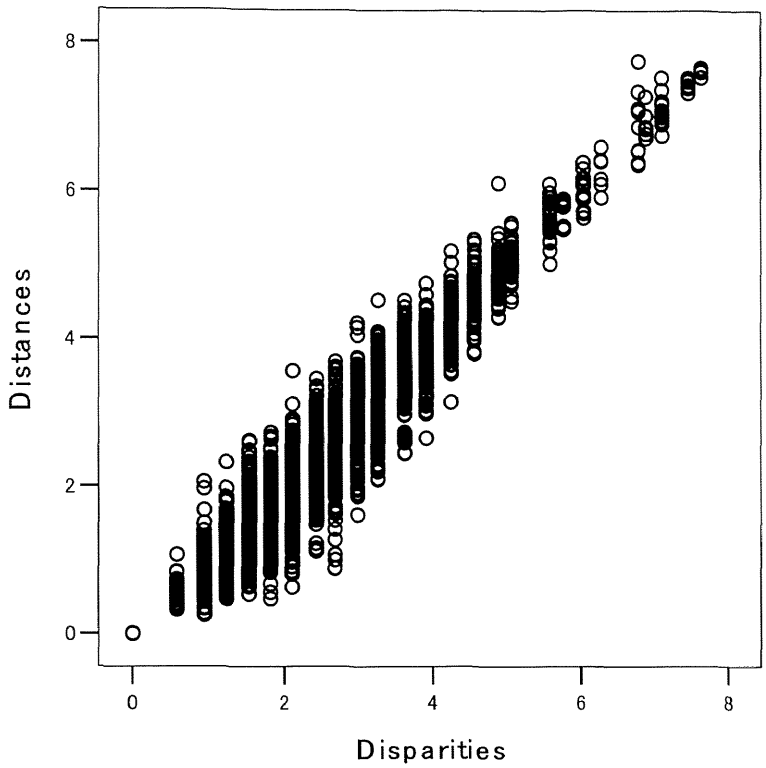

Distances
Disparities
0
2
4
6
8

Figure 1-3: MDS result (3 dimensions) for the sample of Figure 1.1 in which NIEs and ASEAN are combined, with symbol style indicating presence in China

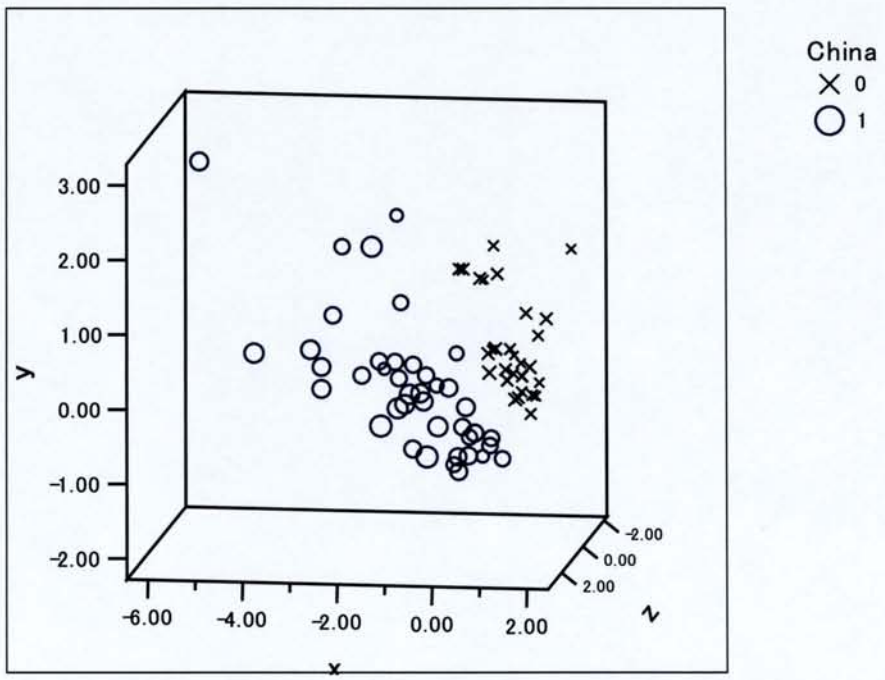


Figure 1-4: Stress values for the sample of Figure 1.1 (straight line) and that of Figure 1.3 (dash line)

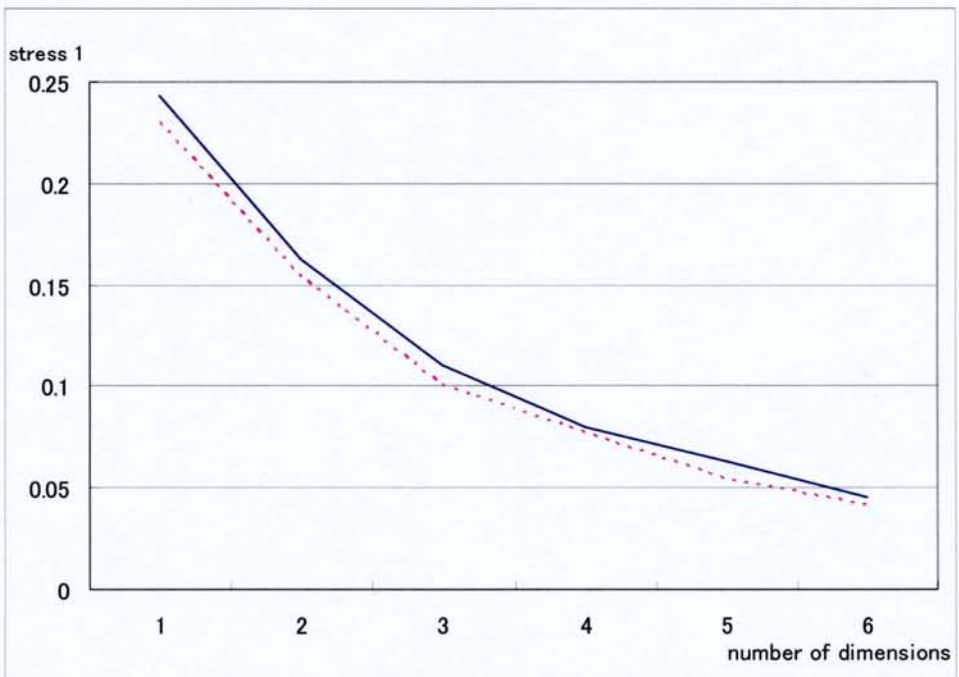


Figure 1-5: MDS result (3 dimensions) when scope 1 level is 7 (N=71)

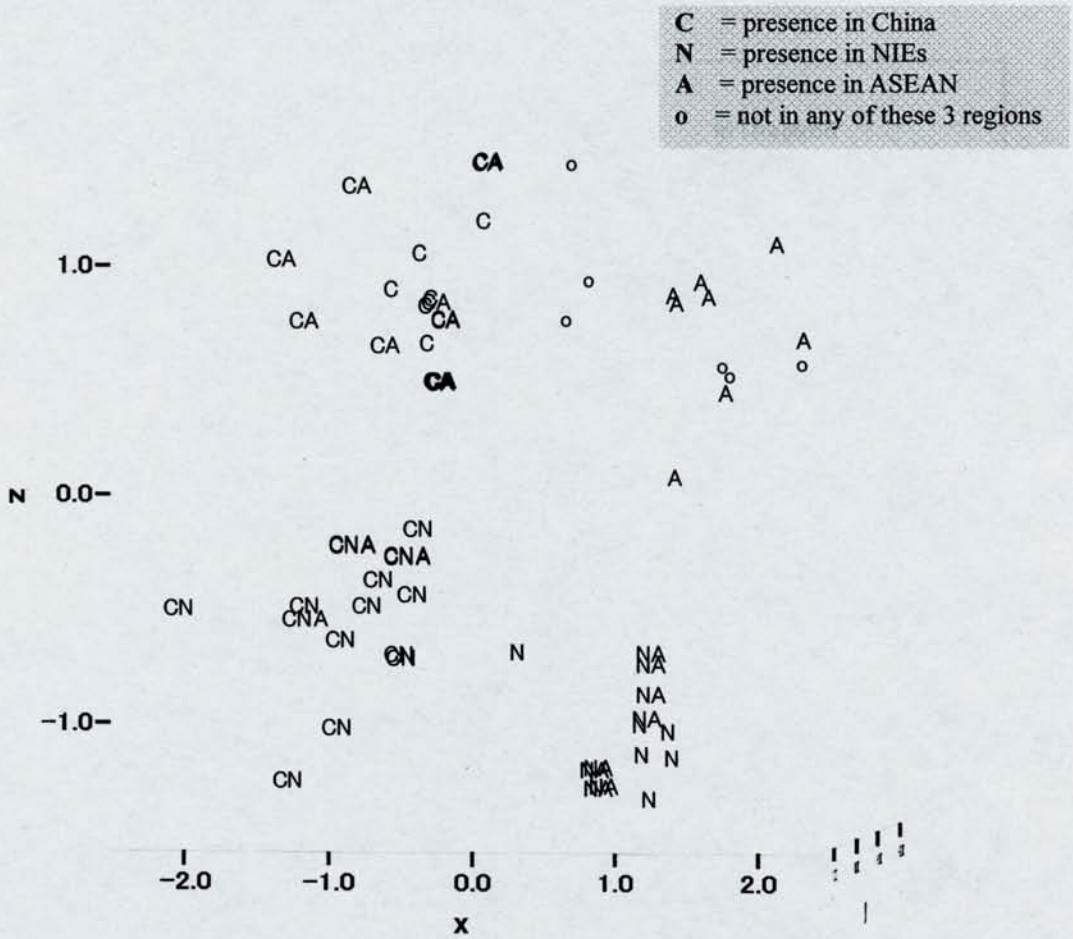


Figure 1-6: Scree plot for three random samples (N=100) from 1052 MNEs with ties preserved in two samples (straight lines) and untied in one sample (dotted line)

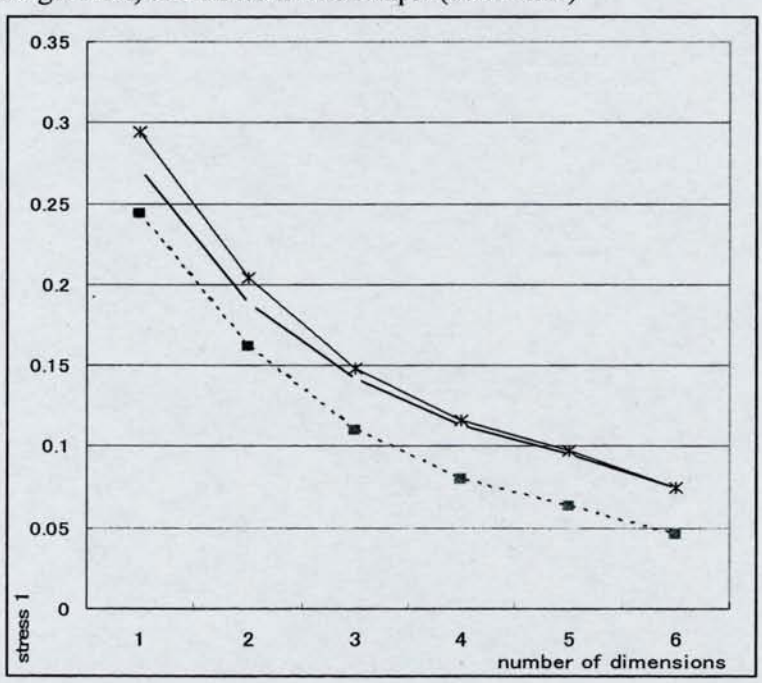


Figure 1-7: MDS solution (3 from 5 dimensions) for a sample with scope 1 = 8 with respect to the 28 regions in Table 1.2. (N=85), with labels for manufacturing presence (1) or absence (0) in China and symbol style for manufacturing presence in Thailand

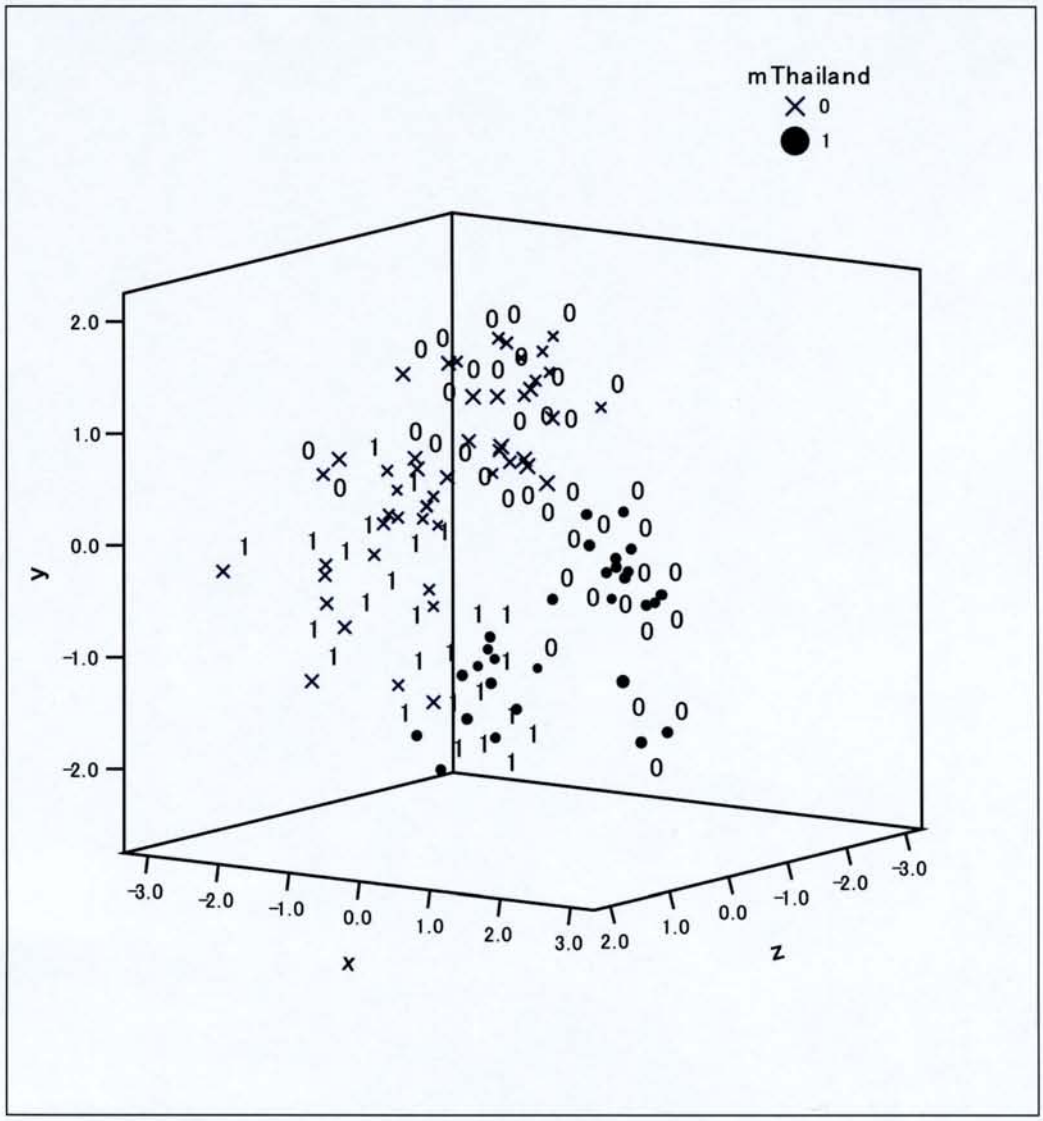


Figure 1-8: MDS solution (3 from 4 dimensions) for a sample with scope 1 (with respect to the 28 regions in Table 1.2) between 10 and 24 (N=100), with labels for manufacturing presence (1) or absence (0) in Indonesia and symbol style for manufacturing presence in Thailand

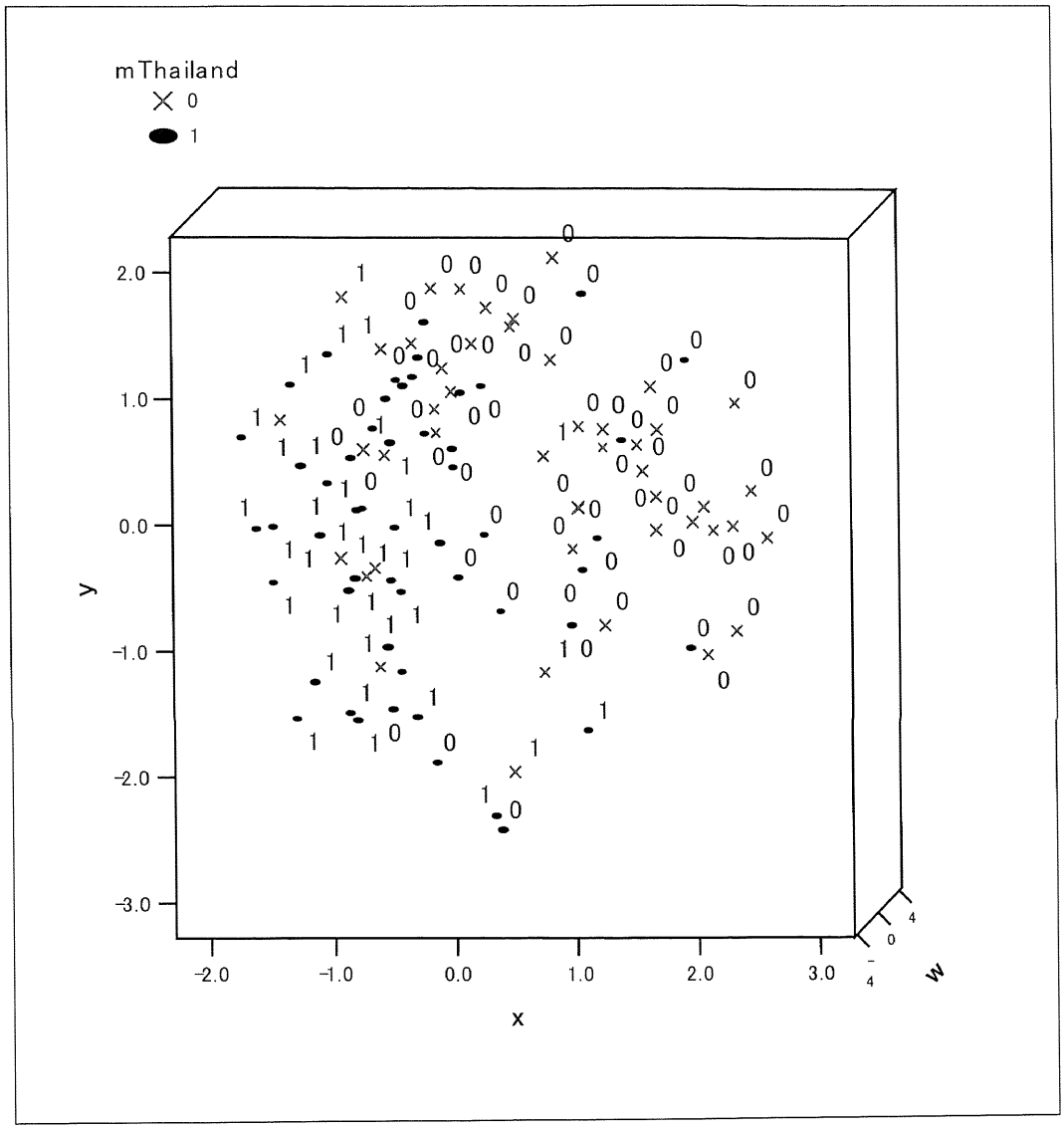


Figure 1-9: Scree plot for a random sample (N=100) with respect to 28 regions from 1052 MNEs with ties preserved (straight line) and untied (dotted line)

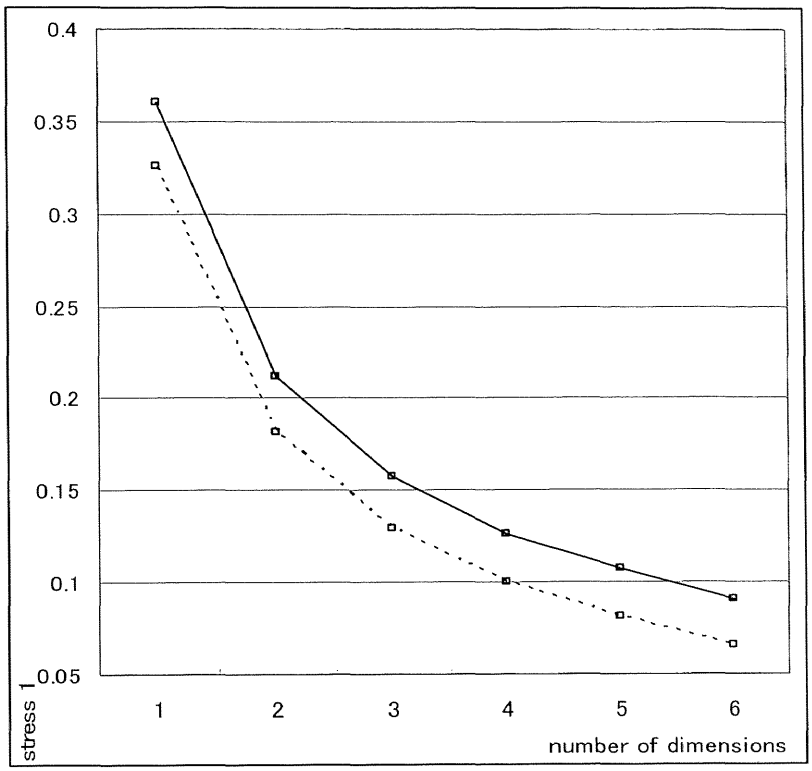


Figure 1-10: Correspondence analysis result for region representation based on manufacturing subsidiaries of 1052 MNEs in 14 locations and binary data

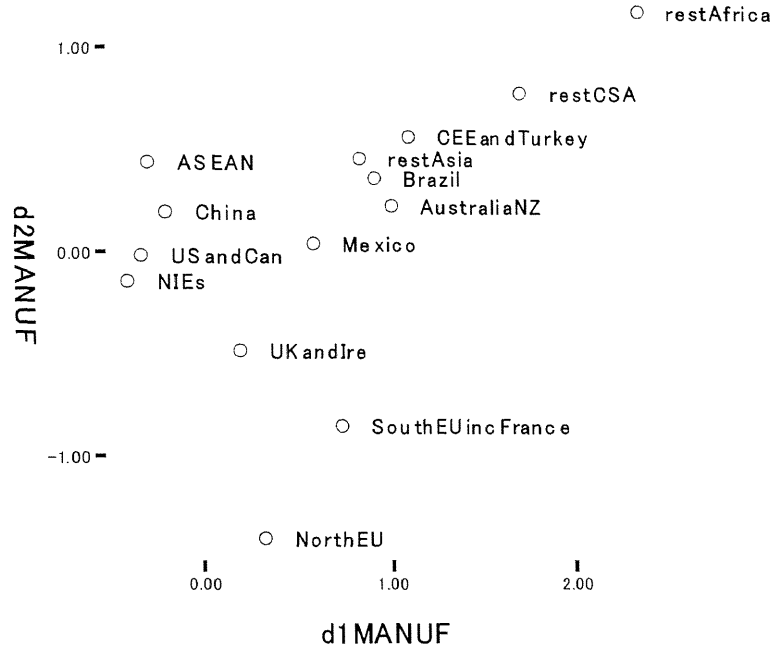


Figure 1-11: Correspondence analysis result for region representation based on all subsidiaries of 1052 MNEs in 14 locations and binary data

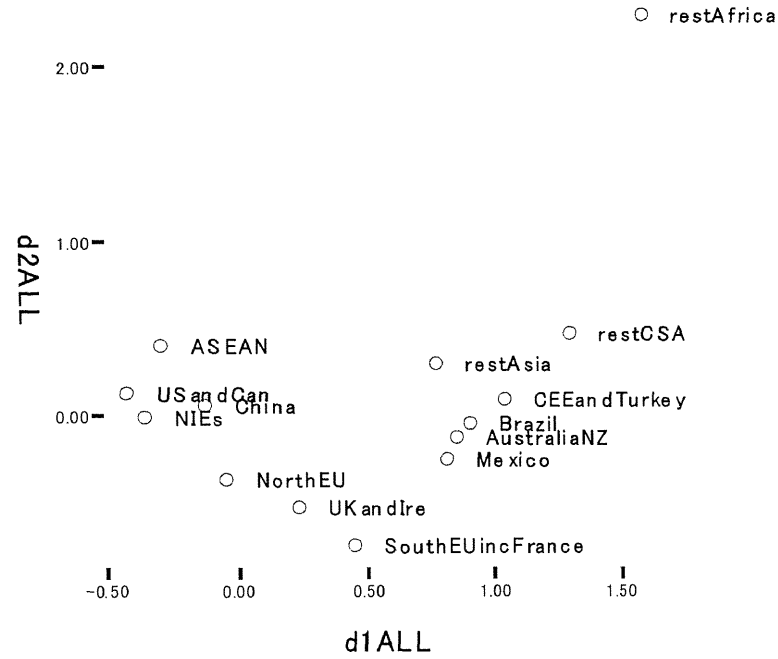


Figure 1-12: Correspondence analysis result for region representation based on all (number 1 to 14 as in Table 1.3) and manufacturing (numbers 15 to 28 in the same order as in Table 1.3) subsidiaries of 1052 MNEs in 14 locations and count data

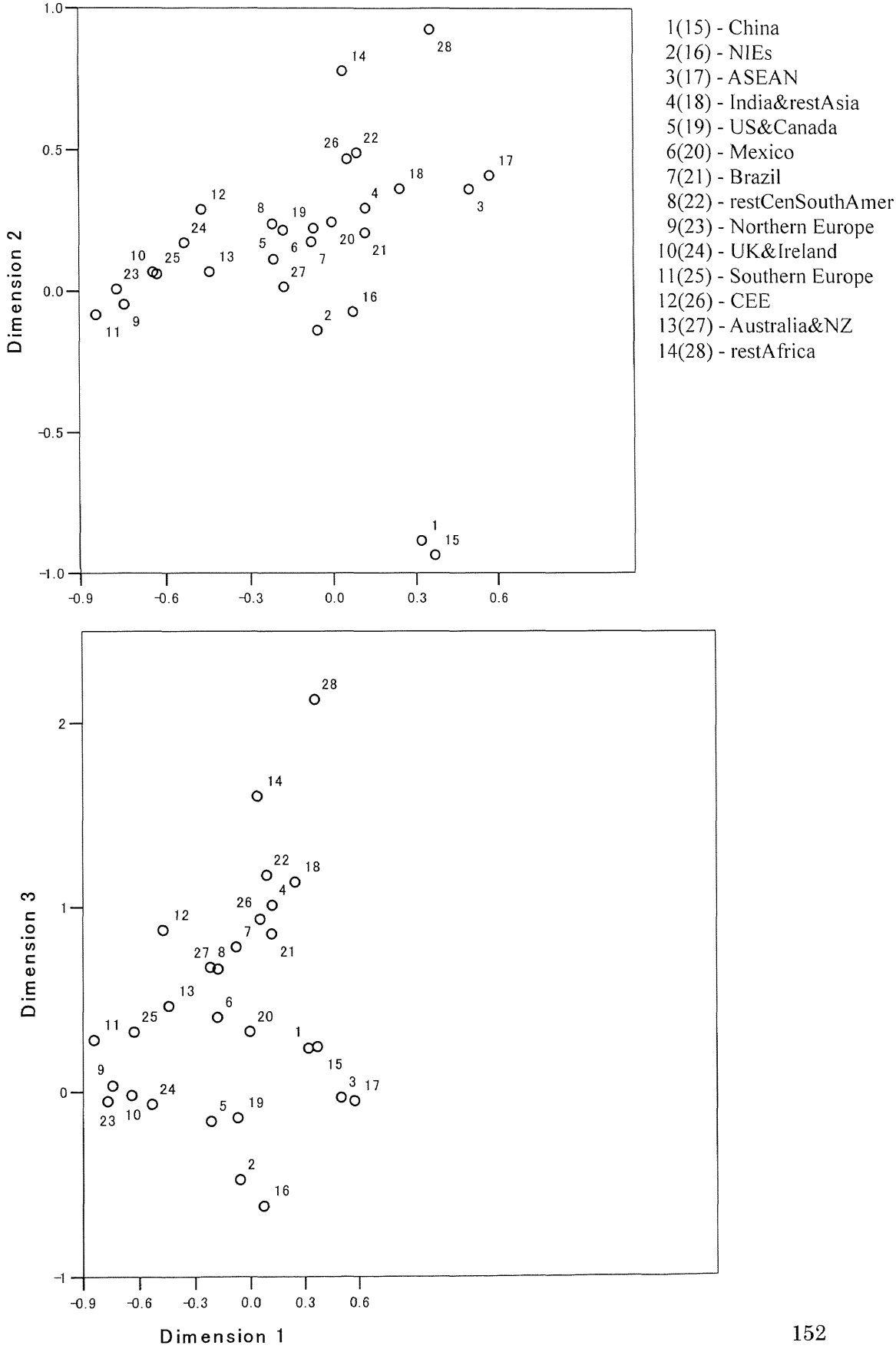


Figure 1-13: Lowest investment scales for each country and parent firm (821 firms)

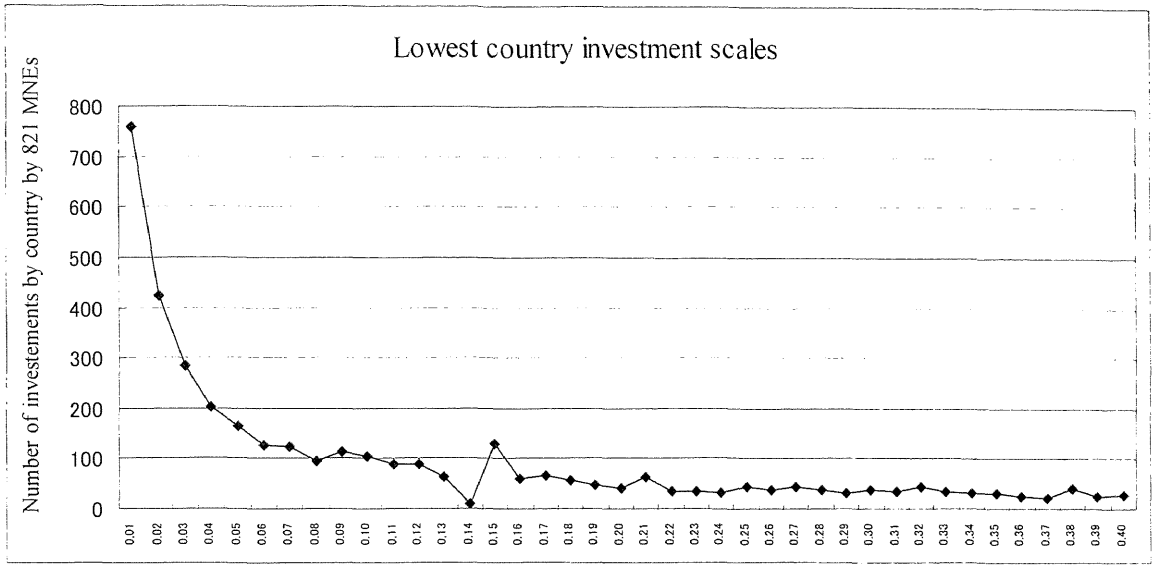


Figure 1-14: Scree plot of the first fifty eigenvalues for PCA of 821 firm correlations over the 14 regions in Table 1.3

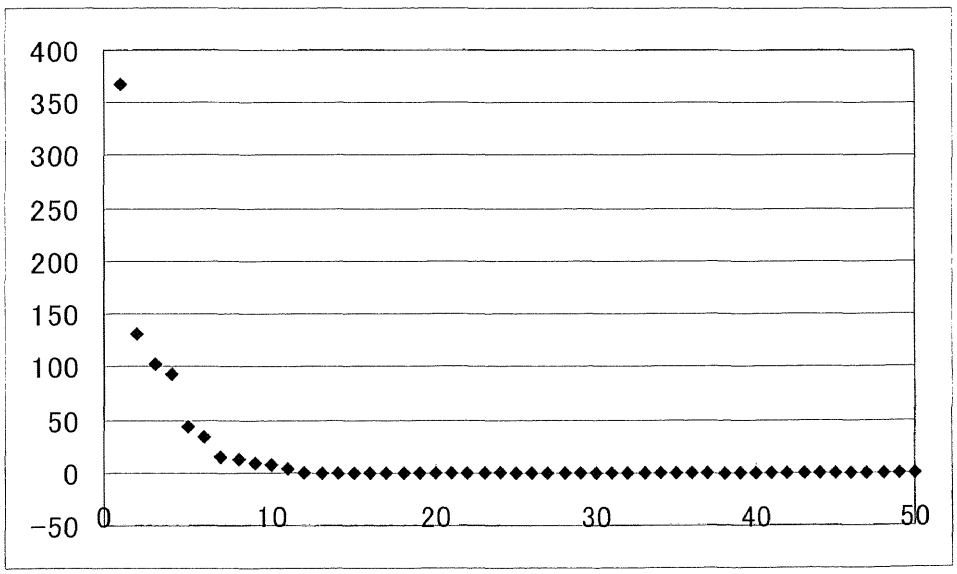
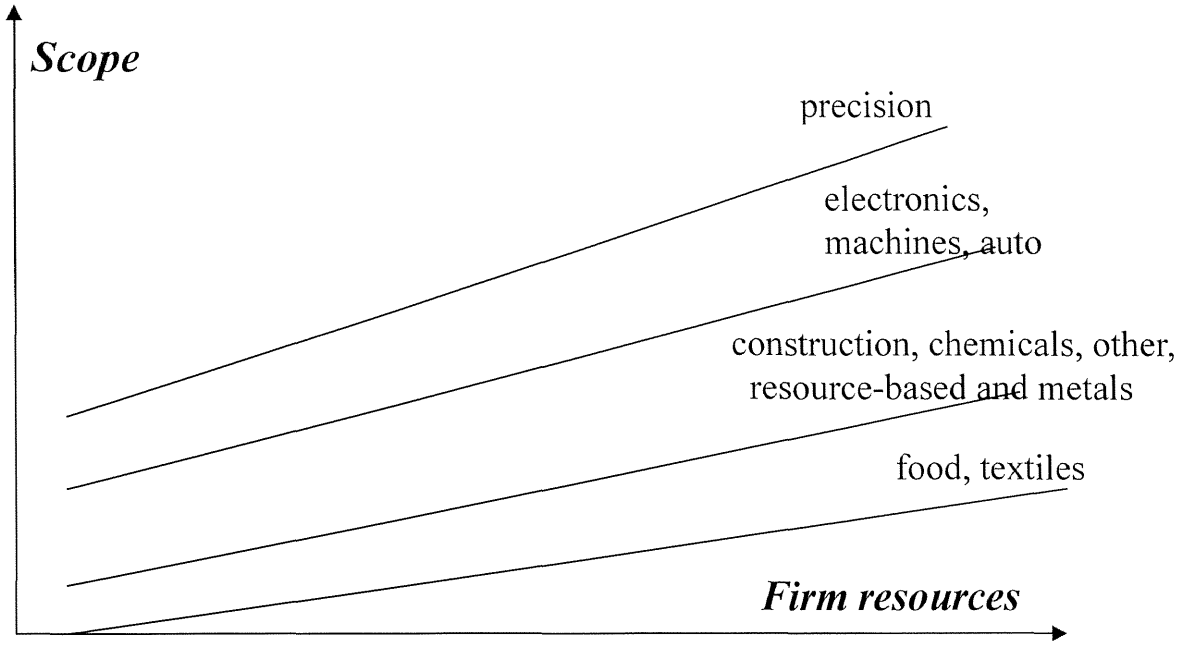


Figure 1-15: Industry effect on scope

(A) Scope with respect to all subsidiaries



(B) Scope with respect to manufacturing subsidiaries

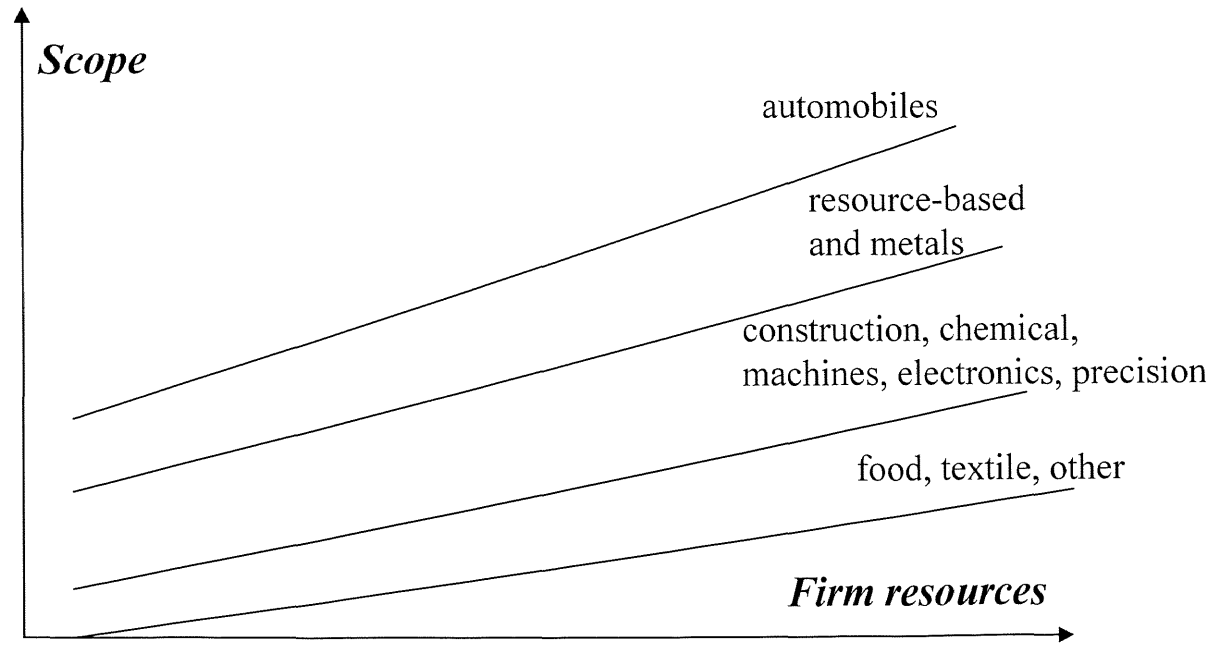


Figure 1-16: Manufacturing versus sales strategies for 1052 MNEs in 28 regions (with numbers as in Table 1.2)

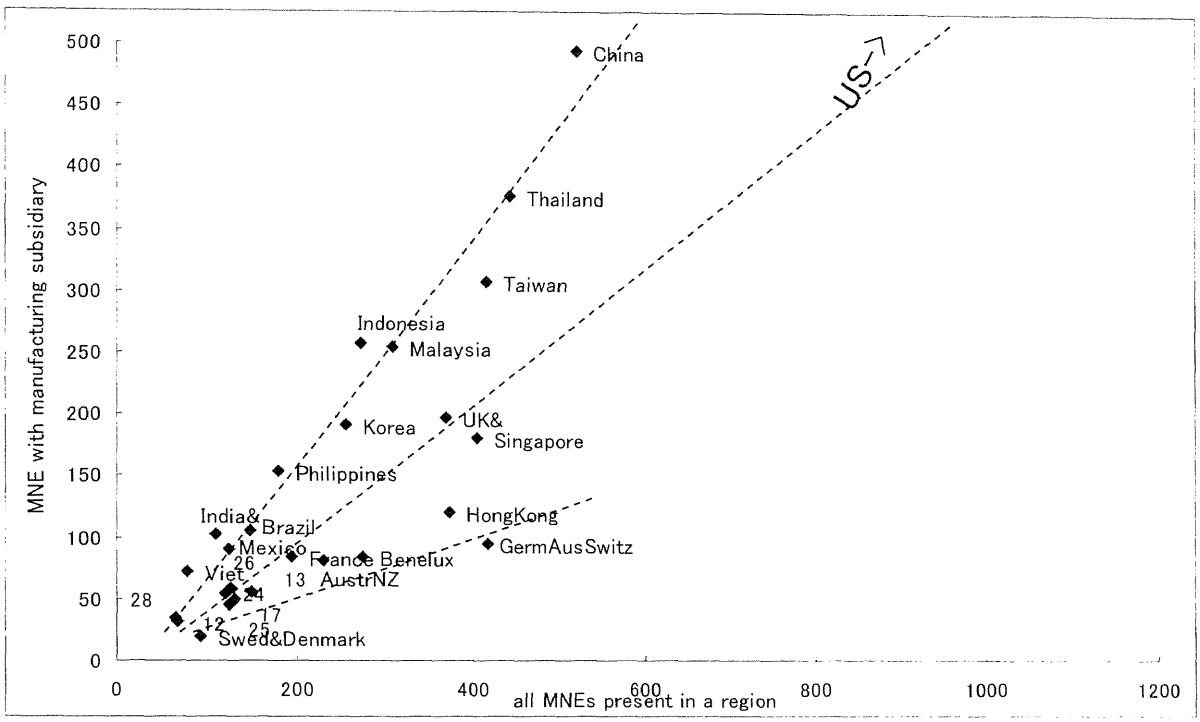


Figure 1-17: Distribution of first year of investment for 1052 MNEs

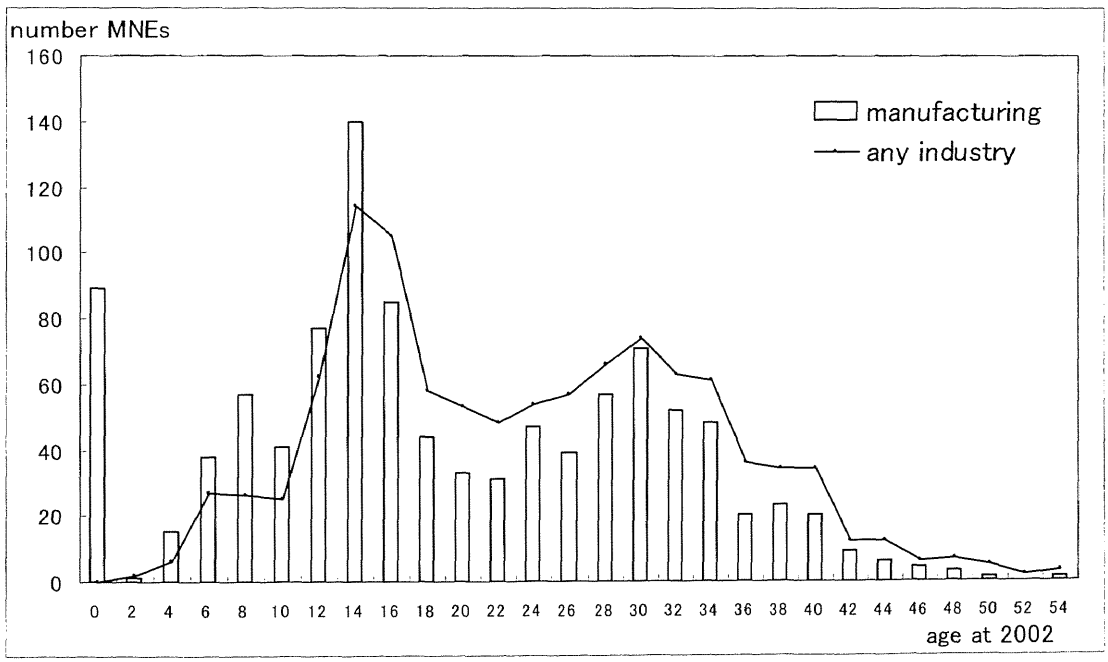
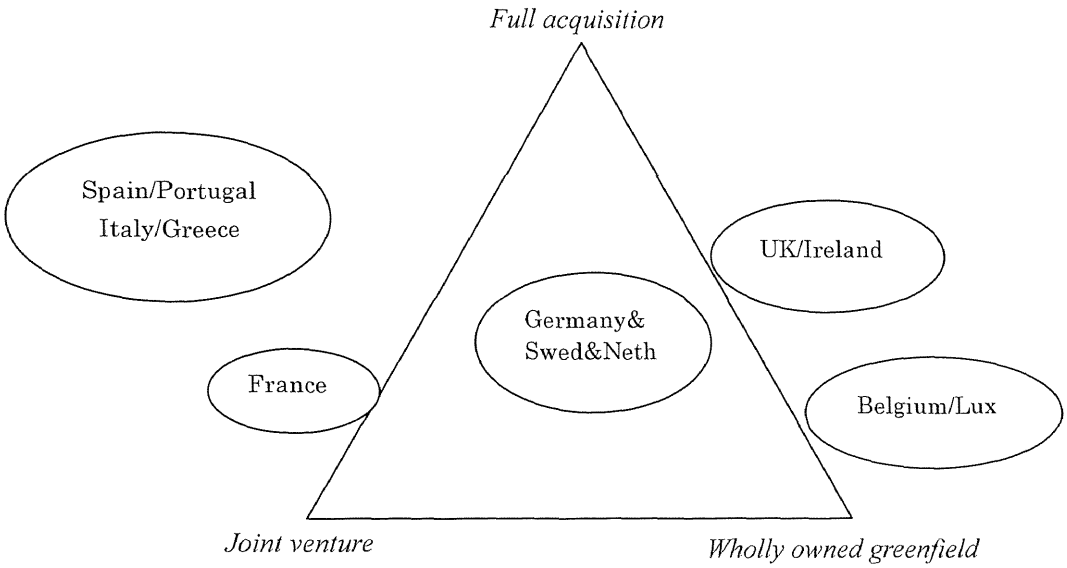


Figure 2-1: Summary of country effects on entry mode (based on Table 2.7)



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