

Multinational Enterprises, Local Linkages and Resource Transfer: The Building Blocks of Radical Innovation in Finland

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MULTINATIONAL ENTERPRISES, LOCAL LINKAGES AND RESOURCE TRANSFER: THE BUILDING BLOCKS OF RADICAL INNOVATION IN FINLAND

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MULTINATIONAL ENTERPRISES, LOCAL LINKAGES AND RESOURCE
TRANSFER: THE BUILDING BLOCKS OF RADICAL INNOVATION IN
FINLAND

Objective of the Research

The purpose of this research is to examine inter-company linkages between multinational enterprises (MNEs) and locally based companies in Finland in terms of linkage quality, quantity and type. In addition, firm-level determinants of MNEs' ownership and cluster membership as well as locally-based companies' absorptive capacity are analyzed in order to further explore the nature of inter-company linkages in Finland. Inter-company linkages are becoming increasingly important because knowledge required for innovation is seldom found internally any longer. Inter-company linkages are essential for creating radical innovations and sustaining the competitiveness of Finnish companies in the near future.

Methodology

This thesis used a quantitative approach for collecting and analyzing data. The data was collected as part of a GlobeConnect research project with a questionnaire. The questionnaire was sent to the 500 largest companies based on turnover in Finland and 81 responses were received. Companies with only domestic operations were excluded from this thesis in order to ensure that the sample group is coherent in terms of size and level of internationalization. Therefore 59 respondents were analyzed in this thesis.

Findings and Conclusions

The main findings show that the respondent MNEs are more likely to share R&D and marketing resources with their local buyers while management and HR resources are more likely shared with MNEs' local suppliers. The results also indicate that R&D resources are more likely to be shared via inter-company linkages in Finland than management, marketing or HR resources. In general, MNEs receive more resources from locally-based companies than vice versa. Therefore it is argued that local companies are not absorbing the full potential of resources available at MNEs.

Key words

MNEs, inter-company linkages, resource transfer, clusters, radical innovation

MONIKANSALLISET YRITYKSET, PAIKALLISET LINKIT JA RESURSSIEN SIIRTO: RADIKAALIN INNOVAATION PERUSPILARIT

Tutkielman tavoitteet

Tämän tutkielman tavoitteena on tutkia yritysten välistä resurssien siirtoa Suomessa sijaitsevien monikansallisten yritysten sekä paikallisten yritysten välillä määrittelemällä linkkien vahvuus, toistuvuus ja tyyppi. Lisäksi on analysoitu miten linkkeihin osallistuvien monikansallisten yritysten ulkomainen omistususuus ja kuuluvuus klusteriin, sekä paikallisten yritysten kyky imeä resursseja ovat yhteydessä linkkeihin. Yritysten välisten linkkien tärkeys on kasvanut, koska innovaatioihin tarvittava osaaminen löytyy enää harvoin yhden yrityksen sisältä. Yritysten väliset linkit ja resurssien siirto ovat tarpeen, jotta voidaan luoda radikaaleja innovaatioita ja näin ylläpitää suomalaisten yritysten kilpailukykyä.

Tutkimusmenetelmät

Tämä tutkimus on tehty kvantitatiivista tutkimusmenetelmää käyttäen. Aineisto kerättiin GlobeConnect -projektin osana kyselykaavakkeen avulla. Kyselykaavake lähetettiin 500 liikevaihdollisesti suurimmalle yritykselle Suomessa, joista 81 vastasi. Ne yritykset, joilla on liiketoimintaa vain Suomessa poistettiin tässä tutkimuksessa tarkasteltavasta otannasta. Näin haluttiin varmistaa tutkittavien yritysten yhtenäisyys yrityksen koon ja kansainvälisyyden mukaan ja näin ollen 59 yritystä kelpuutettiin mukaan tutkimukseen.

Keskeiset tutkimustulokset

Tämän tutkimuksen tärkeimpiä havaintoja on, että kyselyyn vastanneet monikansalliset yritykset jakavat todennäköisimmin tutkimus- ja kehitysresursseja sekä markkinointiresursseja paikallisten ostajiensa kanssa. Yrityksen hallintoon ja henkilöstöhallintoon liittyviä resursseja puolestaan jaetaan paikallisten tavarantoimittajien kanssa. Tulokset osoittavat, että tutkimus- ja kehitysresursseja jaetaan linkkien välityksellä todennäköisemmin kuin hallinto-, markkinointi- tai henkilöstöhallintoresursseja. Monikansalliset yritykset saavat usein enemmän resursseja paikallisilta yrityksiltä kuin mitä ne siirtävät vastavuoroisesti näille yrityksille, joten paikalliset yritykset eivät käytä linkkien tarjoamaa potentiaalia täysin hyödykseen.

Avainsanat

Monikansalliset yritykset, yritysten väliset linkit, resurssien siirto, klusterit, innovaatio

TABLE OF CONTENTS

1. INTRODUCTION.....	1
1.1. BACKGROUND OF THE RESEARCH.....	1
1.2. RESEARCH GAP.....	3
1.3. JUSTIFICATION FOR THE RESEARCH.....	8
1.4. METHODOLOGY	9
1.5. OUTLINE OF THE REPORT	10
1.6. DEFINITIONS	10
1.7. DELIMITATIONS OF THE SCOPE AND KEY ASSUMPTIONS.....	12
2. EXAMINING INTER-FIRM LINKAGES AND FIRM-LEVEL DETERMINANTS.....	14
2.1. RESEARCH FLOW	14
2.2. LOCATION-SPECIFIC INFLUENCES OF FINLAND	18
2.3. RESOURCES	22
2.4. INTER-COMPANY LINKAGES	25
2.4.1. <i>Dissecting Linkages</i>	26
2.4.2. <i>Types of External Linkages</i>	30
2.5. FIRM-LEVEL DETERMINANTS OF MNEs' OWNERSHIP.....	34
2.6. FIRM-LEVEL DETERMINANTS OF MNE'S CLUSTER MEMBERSHIP.....	35
2.6.1. <i>Clusters</i>	36
2.6.2. <i>Finnish Clusters</i>	38
2.7. FIRM-LEVEL DETERMINANTS OF LOCAL COMPANIES' ABSORPTIVE CAPACITY	40
3. METHODOLOGY	43
3.1. INTRODUCTION	43
3.2. CHOICE OF METHODOLOGY	43
3.3. GLOBECONNECT QUESTIONNAIRE	46
3.4. DATA COLLECTION PROCEDURES	48
3.5. STATISTICAL ANALYSES.....	49
3.6. RELIABILITY AND VALIDITY OF THE STUDY	57
4. EMPIRICAL FINDINGS.....	60
4.1. INTRODUCTION	60
4.2. LINKAGE QUALITY AND QUANTITY	60
4.3. LINKAGE TYPE.....	65
4.4. MNEs' OWNERSHIP AND LINKAGE INTENSITY	69
4.5. MNEs' CLUSTER MEMBERSHIP AND LINKAGE INTENSITY	73
4.6. LOCAL COMPANIES' ABSORPTIVE CAPACITY	77

5. DISCUSSION AND CONCLUSIONS	82
5.1. INTRODUCTION	82
5.2. DISCUSSION OF THE RESULTS	85
5.2.1. <i>H1a and H1b</i>	85
5.2.2. <i>H2</i>	88
5.2.3. <i>H3</i>	91
5.2.4. <i>H4</i>	93
5.2.5. <i>H5</i>	95
5.3. IMPLICATIONS FOR THEORY.....	98
5.5. IMPLICATIONS FOR POLICY AND PRACTICE.....	99
5.6. SUGGESTIONS FOR FURTHER RESEARCH	101
6. REFERENCES	104
7. APPENDICES	116
APPENDIX A. GLOBECONNECT QUESTIONNAIRE.....	116
APPENDIX B. RESPONDENT MNEs' MAIN ACTIVITIES AND CLUSTER MEMBERSHIP.....	125
APPENDIX C. RELATIONSHIP BETWEEN MNE OWNERSHIP AND LINKAGE QUANTITY	127
APPENDIX D. RELATIONSHIP BETWEEN MNE CLUSTER MEMBERSHIP AND LINKAGE QUANTITY	128

LIST OF FIGURES

Figure 1.1. Research gap.....	4
Figure 2.1. Research framework.	15
Figure 2.2. Two types of cooperation: Exchange sharing and integration alliance	28

LIST OF TABLES

Table 2.1. Finland's competitiveness in 2001 and 2009	21
Table 3.1. Variables used to measure linkage quality and quantity in H1a and H1b.....	51
Table 3.2. Variables used to measure linkage type in H2.....	53
Table 3.3. Variables used to measure linkage quality, quantity and type in H3	54
Table 3.4. Variables used to measure linkage quality, quantity and type in H4.....	55
Table 3.5. Variables used to measure linkage quality, quantity and type in H5	56
Table 3.6. Sample demographics	59
Table 4.1. Quality and quantity of resources received by MNEs	62
Table 4.2. Quality and quantity of resources transferred by MNEs.....	64
Table 4.3. Types of linkages when all resources measured.....	66
Table 4.4. Types of linkages compared	68
Table 4.5. Relationship between MNE ownership and linkage quality	70
Table 4.6. Relationship between MNE ownership and linkage type	72
Table 4.7. Relationship between MNEs' cluster membership and linkage quality	74
Table 4.8. Relationship between MNEs' cluster membership and linkage type	76
Table 4.9. Quality of resources transferred and received by MNEs	78
Table 4.10. Quantity of resources transferred and received by MNEs.....	80
Table 4.11. Types of linkages transferred and received by MNEs	81
Table 5.1. Summary of H1	87
Table 5.2. Summary of H2.....	88
Table 5.3. Summary of H3.....	92
Table 5.4. Summary of H4.....	94
Table 5.5. Summary of H5.....	96

1. Introduction

1.1. Background of the Research

MNEs are one of the most significant players worldwide in terms of technology creation and control, and they actively transfer technology internally from their headquarters to their foreign subsidiaries (Maher and Christiansen 2001). They are a mobilizing force for the globalization of innovation and R&D activities (Dachs et al. 2008) by linking MNEs' own subsidiaries, affiliates and joint ventures with subcontractors, suppliers, service providers as well as strategic alliance partners (Ernst and Kim 2002). More specifically, R&D intensive MNEs are often the main actors in transferring technology (Vuori 1995).

Conventional, less recent literature suggests that MNEs should manage superior technology internally and close to their home country in order to avoid leakages (Hymer 1972, Dunning 1974) and lower transaction costs (Coase 1937). Put another way, they argue that MNEs have an incentive to prevent the information leakage that would improve their local competitor's performance. However, even the conventional literature agrees that investing in a technologically advanced country will result in a higher technological knowledge, which will compensate the possible loss in profit (Dunning 1973). Far from the conventional literature, more recent studies among Dunning and Lundan (2008) as well as Castellani and Zenfei (2006) suggest that in addition to transferring resources internally through equity based linkages, MNEs should transfer resources externally through non-equity based linkages. These inter-company linkages are either vertical or horizontal, the former occurring with suppliers and buyers and the latter with competitors or other local partners. Even the largest companies cannot always survive market competition by themselves and every firm maintains long-term business relationships with other companies (Chen et al. 2004). While MNEs' internal units have become more interconnected, these units are also

building external networks with other companies and institutions in order to better generate, use and absorb technology (Castelani and Zanfei 2006). Modern MNEs are global inter-organizational networks that combine customers, suppliers, regulators and competitors to their own internal sources and gain valuable insights (Ghoshal and Bartlett 1990).

Resource transfer is a topic that has received less than its share of attention in literature (Schienstock and Hämäläinen 2001) and the purpose of this thesis is to explore the nature of resources transferred via MNEs' inter-company linkages in Finland. More specifically, resources transferred from MNEs to locally-based companies as well as from locally-based companies to MNEs are analyzed. This two-way resource transfer is referred as resource sharing in this thesis. First, the intensity of linkages is studied in terms of quality and quantity in order to understand the types and extent of resources exchanged. Second, the types of inter-company linkages are examined to discover whether linkages are most likely to occur between MNEs and their locally-based suppliers, buyers or other local partners. Next, whether MNEs' ownership and cluster membership affect to the nature of linkages is analyzed. Finally, the intensity of resources transferred and received by MNEs is compared in order to analyze whether resources are exchanged equally to and from MNEs.

Understanding inter-company linkages and their resource transfer is essential because new knowledge and competencies progress predominantly through business partners' interaction rather than internal research and development (R&D) activities (Forsgren et al. 2005). Not only MNEs benefit from inter-company linkages and resource sharing but they allow local companies to access MNEs' vast knowledge base. MNEs are focal companies whose subsidiaries, according to Scott-Kennel (2007b), act like a 'bridge' between MNE parent enterprise and host country's local business network. When local companies have enough absorptive capacity, they are capable of acquiring outside knowledge that will enable them to create something new instead of merely doing traditional things more efficiently (Vuori 1995) and thus create radical innovations

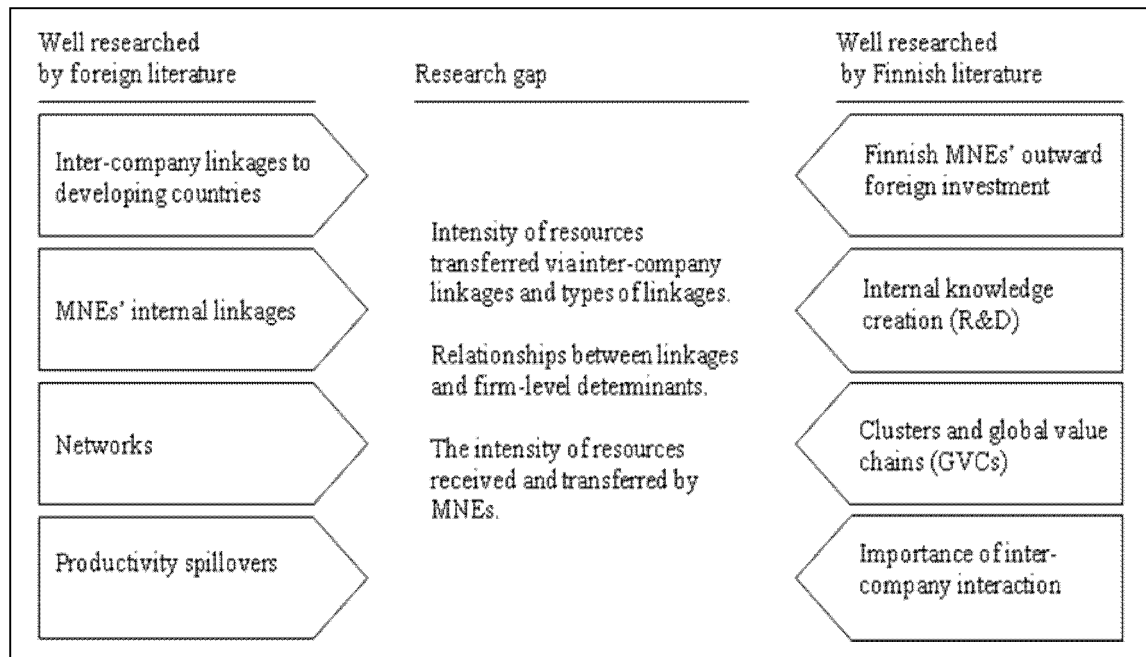
(Sabel and Saxenian 2008). Knowledge required for innovation cannot be found internally within just one company and thus networking and inter-firm coactivity is required (Schienstock and Hämäläinen 2001, Nahapiet and Ghoshal 1998) and it is important to explore the nature of these inter-company linkages.

1.2. Research Gap

This section reviews literature related to linkages and resource transfer by dividing it to research conducted in foreign countries as well as research done in Finland. These two scopes of literature are called foreign and Finnish in this thesis. They are introduced separately because even though linkages and resource transfer have been widely researched around the world, majority of studies mainly examine investment from developed country companies into developing nations where the foreign and local firms have a large technology gap (Scott-Kennel 2007b, see Hansen and Schaumburg-Müller 2006). The same applies for foreign direct investment literature. Finland is a highly developed nation and thus the findings in the foreign literature cannot be necessarily applied in Finland.

Figure 1.1 illustrates the topics that are covered by foreign and Finnish literature as well as the research gap that they have not focused on. They are further introduced in this section.

Figure 1.1. Research gap



MNEs' internal networks and linkages between the headquarters and subsidiaries have been well covered by foreign literature (see Ambos et al. 2006, Castellani and Zanfei 2006). Foreign studies regarding external linkages, however, have mainly concentrated on productivity spillovers that benefit the host countries' economies and have not differentiated resource transfer from spillovers (see Driffield et al. 2002, Smarzynska 2002, Javorcik and Spatareanu 2008).

Two-way linkages are part of larger industrial networks that are widely researched worldwide. The theory of industrial networks has been developed as a result of examining phenomena of companies' long lasting relationships, networks of relations and interactions in such relationships (Forsgren et al. 1995). The authors continue that social sciences have had a central role in creating the network theories. In a network view, the basic unit is not a firm acting in isolation but various agents interacting with each other (Imai 1989). Chen et al. (2004) also state that networks are interconnected business relationships upon which exchanges between actors occur. Castellani and

Zanfei (2006) have studied networks and argue that the external actors, with which the MNEs act, also have extensive networks with other firms. Thus multiple networks are interconnected. The strengths of inter-firm networks are their flexibility, adaptability, and the fact that they require less capital and lower overhead expenses to operate (Buono 2003) and they are more practical when technologies are changing quickly (Langois 1988). Imai (1989) is in line with Langois by stating that network is more flexible than an internal hierarchy and thus forming an inter-firm network is often more advantageous than internalization, especially when the environment is highly changeable (Imai 1989).

Clusters are also widely examined (see Porter 1980, Davis et al. 2009, Simmie and Sennett 1999, Ivarsson 2002) and they will be further introduced in section 2.6. One perspective of examining clusters is global value chains (GVC) wherein global buyers act with local suppliers in different countries (Saliola and Zanfei 2007). Also literature of Finland has examined clusters (see Steinbock 2006, Sölvell and Porter 2002) and in particular the global values chain approach when measuring clusters (see Virtanen and Hernesniemi 2005). They aim to recognize successful key products and then identify companies as well as success factors that affect to the creation of the key products (*ibid*).

Also Finnish studies have often focused on examining macro-economic indicators of productivity (Palmgren et al 2000) and internationalization of Finnish companies abroad instead of foreign companies in Finland (Korhonen et al.1996, see Tahir and Larimo 2006, Gabrielsson et al. 2006). One of the few studies that have analyzed foreign companies in Finland is a longitudinal study regarding the operation strategies of foreign firms in Finland (FIBO) since 1974 (Luostarinen 1981a). They found that foreign MNEs enter the Finnish markets only after the larger and more important markets had been conquered. As part of the FIBO project, Bellak and Luostarinen (1994) examined outward and inward foreign direct investment in small and open economies (SMOPEC), particularly in Finland and Austria. They found that Finnish

companies had four times more outward investments to foreign countries than what foreign companies invested in Finland. However Finland had foreign ownership restrictions until the 1990s (*ibid*) and these two studies were made based on data that was collected in 1990 and before, only a few years after the Finnish capital markets' liberalization. The imbalance between Finnish companies' outward investments to abroad and foreign companies' inward direct investments in Finland has continued. In 2000, Finnish companies invested 20 billion euros directly in foreign markets while foreign direct investments in Finland were only seven billion euros (Puttonen 2004). Perhaps this is the reason why the majority of the Finnish literature focuses on Finnish companies in foreign countries, not foreign companies in Finland.

Another piece of research regarding the inward foreign investment in Finland was conducted by the Research Institute of the Finnish Economy (ETLA in Finnish) and studied foreign companies' investment motives in Finland and Finland's operating environment. The study found that the main reasons for foreign companies to locate in Finland were the attractiveness of the Finnish markets and technology (Lindström 2004). The studies introduced above examined the reasons and extent of foreign companies' decisions to locate in Finland, but they do not focus on factors related to linkages with locally based companies nor resource transfer.

Literature in Finland has focused on companies' internal knowledge creation activities instead of paying attention to local knowledge transfer and diffusion (Schienstock and Hämäläinen 2001). Knowledge creation, more specifically R&D, and high technology have been fundamental to Finnish companies' success during past 20 years. One of the few studies is by Vuori (1995) who examined various technology sources in Finnish manufacturing industries and their effects to total factor productivity. The author found that technology embodied in foreign capital goods, put another way, bought in form of foreign machinery, was the most important source in the early 1980's. Towards the early 1990s, Finnish companies' R&D activities were so advanced that their own R&D was the most productive source of technology and importing R&D declined (*ibid*). The

development of the knowledge creation, thus R&D, activities in Finland is further examined later in this thesis.

Perhaps the most relevant Finnish study for this thesis is conducted by Technical Research Center of Finland (VTT in Finnish) that studied Finnish innovations (hereafter called the Sfinno project) during the 1980s and 1990s. They examined how rapid industrial renewal, largely characterized by R&D intensive industries' rapid growth, affected to Finnish industries. The researchers found that 87 percent of all innovations created by the respondent companies had been developed in collaboration with other actors, mainly with local customers. This indicates that the innovations are primarily market driven in Finland. In addition to domestic customers, Finnish companies integrate external knowledge from domestic subcontractors, universities and research institutions (Palmgren et al. 2000). The authors remind that it should not be interpreted that only domestic collaboration creates innovation-related networks because foreign partners' involvement in the whole innovation process was not measured.

Along with Palmgren et al., also Sabel and Saxenian (2008) have found that inter-company partnerships and resource transfer have resulted in more innovative solutions and thus higher productivity in Finland. Internal knowledge creation through R&D is not sufficient to build competitiveness anymore, which has created a demand for higher level collaboration of combining knowledge resources and creating radical innovations (see Sabel and Saxenian 2008). Figure 1.1 illustrates that inter-company linkages have been identified essential to sustaining Finnish companies' competitiveness in the future. Also Giroud and Scott-Kennel (2009) argue that "too few studies examine the actual attributes of linkages at the enterprise level". Literature appears to have put less emphasis to further explore the intensity of resources transferred via inter-company linkages as well as whether these linkages are created mainly with suppliers, buyers or other partners. Also, the relationship between linkages and certain firm-level determinants, as well as whether resource transfer is more likely to occur to or from

MNEs have received less attention among literature. This is the research gap this research aims to cover and these factors are introduced in the next chapter.

1.3. Justification for the Research

The benefits of inter-company linkages to participant companies have been strongly emphasized by literature, as was discussed in the previous section. In addition, countries are seeking to attract, retain and benefit from integration of inward FDI and they need to identify the types of investments most likely to create the linkages that are best suited to their country's development stage and to ensure that barriers to those types of linkages are minimized (Scott-Kennel 2007b). Furthermore, discovering resource transferring MNEs will allow policy makers to create incentives to attract such MNEs in Finland, encouraging linkage generation with local actors (Giroud and Scott-Kennel 2009). In addition to foreign affiliates, also domestic MNEs are an important source for sharing resources with local companies and they are also included in this research.

As mentioned in section 1.1, resource sharing is an essential element of radical innovations (Sabel and Saxenian 2008) and knowledge required for innovation is difficult to create internally within just one company and thus networking and inter-firm coactivity is beneficial (Schienstock and Hämäläinen 2001, Nahapiet and Ghoshal 1998). Examining MNEs' linkages in Finland reveals local companies' ability to capitalize from the knowledge received from MNEs and incorporate that into radical innovations. In order to cover the research gap introduced in the previous section, we focus on the following research questions:

How intensive are linkages between MNEs and locally based companies in Finland and are they most likely to occur with suppliers, buyers or other partners? Are there relationships between inter-company linkages and MNEs' firm-level determinants of foreign ownership and cluster industry membership? Is the resource transfer from MNEs to local companies and vice versa likely to be equal?

In order to answer to the research questions, this thesis analyses MNEs' linkages with locally based companies in Finland from five different aspects, which are enlightened with literature in the second chapter.

1.4. Methodology

The research uses the data collected as part of the Globe Connect research project. The research was conducted through the survey instrument; an on-line questionnaire distributed amongst the 500 largest companies in Finland, based on turnover. The sample size includes both wholly Finnish owned MNEs and foreign MNEs' affiliates that are located in Finland.

The respondent MNEs' linkages with their local suppliers, buyers and other local business partners (other than suppliers or buyers, hereafter 'other partners') are examined in this thesis. Linkages are examined from MNEs' perspective, more specifically multiple linkages formed by single respondent MNEs with locally based suppliers, buyers and other partners. MNEs are studied in this thesis because "studies taking the individual firms as starting point would enhance understanding of the interaction between MNEs and the local environment" (Meyer 2004). MNEs are asked to state the extent of which they transfer resource either with their suppliers, buyers and other partners. These are referred as locally-based companies (hereafter also local companies) in this research and can be foreign or domestic owned and SMEs or MNEs.

The methodology used will be discussed in detail in chapter three.

1.5. Outline of the Report

The remaining of this thesis is structured as follows. Chapter one discusses the reasons why MNEs' linkages and resource transfer behavior in Finland needs to be examined. In addition, the research problem is introduced. Chapter two introduces a framework that guides the flow of the thesis. The literature will be examined in the sequence identified in the framework and hypotheses are set based on the findings. Chapter three introduces the Globe Connect questionnaire, which is the methodology used to collect empirical data for this thesis. Chapter four consists of quantitative analyses of the results and chapter five discusses them in light of literature examined in chapter two. Chapter five also includes the conclusions and states the main findings of this thesis.

1.6. Definitions

Definitions used in literature are not always uniform. This section will define the terms used in this research.

Clusters are centers of excellence where interconnected companies generate synergies and create more value than they would create alone (Porter 1980). Finland has four key clusters that are ICT, forest, metal and chemical industries (Steinbock 2006).

Competitive advantage is created by performing strategically important activities better than the competitors do. This can be achieved through cost leadership, differentiation or focus strategies. (Porter 1985).

Direct resource transfer in this thesis refers to voluntary and cognizant transferring of resources between companies.

Foreign direct investment (FDI) is an establishment or expansion of firm's operations in a foreign country (Czinkota et al. 2005).

Indirect resource transfer in this thesis refers to involuntary resource transfer between companies that occurs for example via employee mobility and reversed engineering. It also includes informal resources trading, that is, exchanging knowhow through informal networks of rival and non-rival firms' employees, such as conferences (Carlsson 1989).

Linkage types are divided in three groups in this thesis: 1) linkages with suppliers, 2) with buyers and 3) with other partners.

Locally based companies refer to companies located in Finland regardless of whether they originate from Finland or other country. They can be SMEs or MNEs.

Multinational enterprise (MNE) is a company that invests in more than one country around the globe (Czinkota et al. 2005). MNEs can also be called multinational companies (MNC) or transnational companies (TNC).

Network is a form of multi-faceted inter-organizational relationship through which information is generated (Imai 1989).

Radical innovations are created by combining different knowledge sources in a unique manner (Kosonen 2008).

Resources in this thesis have been categorized into 4 groups: 1) R&D (technical know-how, R&D and innovation resources), 2) management (organization and management know-how), 3) marketing (marketing know-how and market information resources) and 4) HR (training and development of human resources).

Resource sharing refers to two-way resource transfer. More specifically, it is the resources transferred and received by MNEs in this research. Inter-company linkages consist of this two-way resource transfer.

SME refers to small and medium size enterprises. European Commission classifies SMEs as companies with less than 250 employees (European Commission, retrieved 29.10.2009).

Spillovers occur when a MNE is not able to benefit from resource leakage to or subsequent usage of transferred resources by local firms (Smarzynska 2002).

Strategic alliance is “a cooperative agreement between firms in which partners may contribute resources, technology or firm-specific assets” (Chen and Chen 2002, 2003) and it aims at creating competitive advantage for the partners (Das and Teng 1999).

Technology gap refers to differences in transferor’s and transferee’s technological capabilities (Castellani and Zanfei 2005).

1.7. Delimitations of the Scope and Key Assumptions

This thesis does not focus on the capital investments received from the foreign investors but the linkages between MNEs and their suppliers, buyers as well as other local business partners in Finland. Literature typically has examined relationships either in the same industry or in related industries but not both (Meyer 2004) but this does not create an accurate view of linkages (Giroud and Scott-Kennel 2009). Linkages are not restricted to certain industries in this thesis in order to cover a wide scope of industries and players.

MNEs were asked to evaluate the extent of these linkages on average (please see

Appendix A: Questions 16-18, and 21-23, p.120-121). The quality and quantity of shared resources are measured merely based on MNE executives' assumptions of what they contribute and derive from locally based companies in Finland. This results in two limitations. First, the resource transfer process is measured only from the MNEs' perspective. Whether locally based companies consider themselves to be receiving as many resources as the MNEs consider to be transferring is not measured in this research. Second, the results are vulnerable to bias based on MNE executives' personal evaluation of the resource transfer significance. What one executive might consider as being extensive, another might consider it less significant. However, these types of studies that require the respondent to indicate their level of agreement are widely accepted formats (see Malhotra and Birks 2007).

Clusters are emphasized in this thesis because they model the Finnish business environment. Clusters are part of larger global value chains that are formed around key technologies and products (see Virtanen and Hernesniemi 2005). However, this thesis does not examine MNEs' position in a cluster nor their local business partners in detailed manner. It focuses solely on the resource transfer via linkages between MNEs and locally based companies in Finland. There is an assumption made that all companies that operate in fields of the four main cluster industries in Finland, are connected to the clusters even though they might not be the main players. They can be connected either by manufacturing cluster specific products, creating inputs that are used by another firm in a cluster, or using inputs that are created by clusters (Ivarsson 1999). That is, this thesis refers to companies operating in cluster industries, not clusters per se.

Despite the benefits that MNEs offer their business partners, MNEs also have negative competitive effects mainly towards their local competitors from whom they capture market share. Hence, the extent of resource transfer does not directly indicate whether MNEs are beneficial for local companies in general. Instead, MNEs' resource transfer intensity provides an indication of whether they put effort into shared knowledge

development with their local partners. Then, local partners' capability to utilize the resources received from MNEs determines the impact that MNEs have on them.

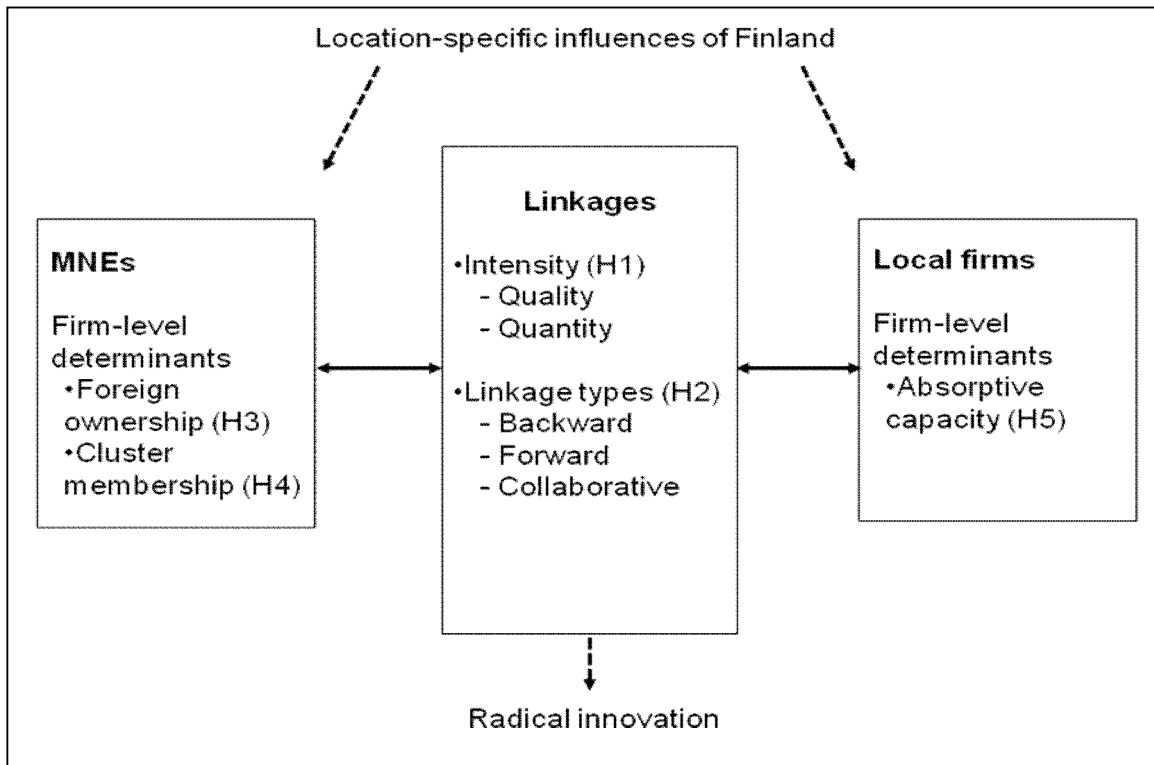
2. Examining Inter-Firm Linkages and Firm-level Determinants

2.1. Research Flow

This chapter discusses literature that is relevant for inter-company linkages and resource sharing between MNEs and locally-based companies. The location-specific advantages of Finland are introduced first because they influence to the types of activities that MNEs perform and the linkage development potential (*ibid*). Figure 2.1 shows that the location specific factors are the same for MNEs and locally-based companies. They are discussed but their effects are not tested in this thesis and therefore they are introduced with a dashed arrow. The section presents the business environment of Finland and its development into the most competitive economy worldwide in 2001 (World Economic Forum 2003). Once the playground is introduced, literature regarding linkages is discussed.

Giroud and Scott-Kennel (2009) reproach international business literature of not having a common conceptual model to capture the key linkage attributes from an enterprise development standpoint. To overcome the problem, this thesis aims to capture a comprehensive understanding of inter-company resource transfer by measuring linkages and firm-level determinants with five different factors (H1-H5) illustrated in Figure 2.1.

Figure 2.1. Research framework. (Modified from Giroud and Scott-Kennel 2009)



Linkages between MNEs and locally-based firms are illustrated with the box in the middle of the Figure 2.1 and they are explored in terms of intensity and linkage types. Linkage intensity depends on the relationship of the two resource sharing firms (Giroud and Scott-Kennel 2006). Linkage intensity is measured with the amount of resources exchanged and frequency of contact (Chen et al. 2004, Liming 1991), which refer to quality and quantity. Literature typically concentrates on the types of linkages but ignores their intensity and therefore linkage quantity and quality are both central factors (Giroud and Scott-Kennel 2006, 2009).

Quality refers to linkages' development potential, which typically is more intensive as the business relationship is longer, the quality of knowledge and resources' transferred is higher and the extent of multilateral relationships is greater (Giroud and Scott-Kennel

2009). The authors denote that the quality increases as partners learn to cooperate together and build trust. High quality linkages are an indication of partners' close relationships that result in closer technological and strategic collaboration (Duanmu and Fai 2007) and therefore quality is the most important measurement of linkage intensity. It is measured here with the mean of resources transferred and received by the respondent MNEs.

Quantity, on the other hand, refers to the number of linkages formed or their economic value (Dunning and Lundan 2008). This thesis measures the quantity based on the proportion of MNEs that transfer and receive at least some resources with locally based companies in Finland in order to understand how frequently MNEs engage in linkages. Quantity and quality of the types of resources shared between the respondent MNEs and locally based companies are examined in section 2.3. In addition, the first hypothesis (H1) is set.

Linkage *types* are examined in order to understand whether resource sharing is the most likely to occur with suppliers (backward), buyers (forward) or other local partners (collaborative). Literature is typically restricted to linkages that are either with suppliers or buyers or other partners (Giroud and Scott-Kennel 2006) but this thesis explores all of them to cover a broad scope. More specifically, we are interested in the quality of different types of linkages that is discussed in section 2.4 where the second hypothesis (H2) is set.

Firm-level determinants affect to the intensity and types of linkages and consist of strategies, networks and absorptive capacity (Giroud and Scott-Kennel 2009). MNEs' strategies and roles are often different in their home country than in host countries and therefore we analyze whether Finnish or foreign MNEs are more likely to engage in linkages as measured by quality, quantity and type. This relationship is represented with an arrow between the MNE box and linkages intensity box in Figure 2.1. The relationship is analyzed in section 2.5 where the third hypothesis (H3) is stated.

The second firm-level determinant measures the difference in resources shared by MNEs than operate in cluster and non-cluster industries. Established networks are found especially in clusters, and whether they have a positive relationship with linkage intensity measured by quality, quantity and type. This relationship is also represented as an arrow between the MNE box and linkage intensity box in Figure 2.1. Literature regarding the cluster's effect to resource transfer intensity is examined in section 2.6 where the fourth hypothesis (H4) is created.

The fifth research topic seeks to compare resource sharing habits of MNEs and locally based companies. The aim is to discover the third firm-level determinant, absorptive capacity of local companies. Zahra and George (2002) define the absorptive capacity as the company's ability to generate and exploit knowledge to acquire and sustain a competitive advantage. On the other words, it demonstrates locally based companies' ability to maximize the benefit of the resources received from MNEs. It is measured by analyzing the difference between resources received and transferred by MNEs. This relationship is represented as an arrow between the linkages intensity box and the local firm determinant box in Figure 2.1. Literature regarding local companies' absorptive capacity is discussed in section 2.7 and the fifth hypothesis (H5) is formulated at the end of the section.

The types of linkages and resources transferred affect to the level of radical innovation creation in Finland. Innovation is "perhaps the most important source of competitive advantage in advanced economies" (World Economic Forum 2003). The global business environment is changing rapidly and in-house innovations alone are not sufficient anymore (Sabel and Saxenian 2008). Therefore a better understanding of the linkages will result in better understanding and potentially in stronger development of radical innovations in Finland. The relationship between linkages and radical innovation is illustrated with a dashed arrow because it is not tested in this thesis. However, it is an incentive for exploring linkages and therefore it is included in Figure 2.1.

2.2. Location-specific Influences of Finland

This research examines MNEs in Finland where a distant geographic location, open economy, small population of 5.3 million (Tilastokeskus, retrieved 21.8.2009) and strong industrial clusters create a unique setting for businesses. In the 1980's, foreign companies were hesitant to make large financial commitments in Finland due to cultural distance, small size, remote location, non-strategic nature of the Finnish markets (Luostarinen 1981b). However Finland has become an advanced, open economy during the late 20th century. Understanding Finland's economic development is vital in order to comprehend the linkages and resource transfer that guide technological advancement and radical innovation creation in Finland.

Finland faced a serious recession in the early 1990's, which was a sum of credit losses, bankruptcies and banking crisis. Real Gross Domestic Product, real GDP, dropped by over 10 percent and previously strong forest based industries experienced a major downturn. In addition, mismanaged financial liberalization and unrestrained credit expansion resulted in household and enterprise indebtedness in private sector. (Kiander and Vartia 1996)

It was recognized that in order to survive from the recession more industrial activity and enterprises were needed (Romanainen 2001). Forest and metal industries had been traditionally strong but the recession showed their vulnerability and hence a need for new high-technology industries arose. The Finnish Science and Technology Policy Council, which is chaired by the Prime Minister, launched a Center of Excellence Program in the early 1990s, which was created to "strengthen regional competitiveness by increasing innovation, renewing the regional production structure, and creating new jobs in selected expertise areas" (Sölvell and Porter 2002). Even though public expenditures were cut in the midst of the recession, research and development (R&D) was heavily invested both in private and public sectors (Rouvinen and Ylä-Anttila 2003).

The recession was conquered in the mid 1990's and both Finnish and foreign owned companies had established R&D activities in Finland. MNEs such as Ericsson, Hewlett Packard, IBM and Siemens had established R&D facilities in Finland in the 1990's in order to have intensive co-operation with Finnish firms (Maher and Christiansen 2001). MNEs' R&D units in Finland were strategic knowledge centers especially in fields of information and communication technology (hereafter ICT) (Pajarinen and Ylä-Anttila 2001). Finnish companies in ICT sector, especially Nokia, and metal industries had also strong R&D units in Finland (Steinbock 2006). Sölvell and Porter (2006) point out that as investment in IT and telecommunications-related R&D increased significantly in the 1990s, universities and the public sector also increased their R&D. Finland became a country known for highly skilled IT professionals.

The Finnish financial markets had been opened to foreign investors in 1993 (Puttonen 2004) and stock markets became more important, which further influenced the increasing demand for new forms of financing and foreign capital (Ylä-Anttila et al. 2004). Foreign investors had become important for Finnish companies, especially SMEs, but their most important contribution was through positive impact on the firm's performance rather than as a source of new capital (Hyytinen and Pajarinen 2003). Many Finnish companies were merger and acquisitions targets and thus are now subsidiaries of foreign multinationals (Ylä-Anttila et al 2004, Puttonen 2004). In 2000, roughly 75 percent of the shares on the Helsinki Stock Exchange (HEX) were foreign owned (Puttonen 2004).

The Statistics Finland research showed that already in 1999 Finnish industries had experienced a structural change from previously strong metal, engineering and paper manufacturing industries towards high tech products based on the R&D intensities in the main clusters (Luukkainen and Pentikäinen 2000). By 2002 the relative R&D intensity (gross domestic R&D expenditure, GERD, in relation to GDP) in Finland was the second highest in the world after Sweden (Rouvinen and Ylä-Anttila 2003). In a

decade, Finland had gone from being one of the least ICT specialized countries to one of the most specialized (Koski et al 2002). Finland had also risen to be one of the most competitive countries in the world due to strong political institutions, focus on technology led by Nokia and strong macroeconomic management (World Economic Forum Report 2003).

In fact, Finland was ranked the most competitive economy in the world in 2001 and 2003. This assessment was based on numerous international indicators, including infrastructure, macroeconomic stability, education, technological readiness, business sophistication and innovation (World Economic Forum 2009). The ranking has now fallen to the sixth place (World Economic Forum 2009) in the country competitiveness ranking. Although the rankings are approximate and have to be critically interpreted, they can be used as a guideline for a general trend of country competitiveness.

Table 2.1 illustrates that *firm level technology absorption*, which measures companies' interest in absorbing new technology in Finland was ranked the best in the world in 2001 whereas it had fallen to ninth place by 2009. Also, Finland's *FDI and technology transfer* that measure how important FDI is in bringing new technology had fallen from 71th to 86th place. The score, however, had increased from 4.1 to 4.5, which indicates that the FDI had become slightly more important as a source of technology, but the increase in the importance had been weaker than in 15 other countries. The *state of cluster development* rankings, which measure how common and deep the clusters are, had dropped from the first place to seventh place between 2001 and 2009. Similarly, the *quality of scientific research institutions*, which include universities and government laboratories, had fallen from the second to 13th place. The ranking of *property rights* that indicates how clearly delineated and protected the financial assets and wealth are by law, experienced less decrease, only from the third to fourth place. (Porter et al. 2002, Schwab 2009)

Table 2.1. Finland's competitiveness in 2001 and 2009

	2001-2002		2009-2010	
	Rank	Score*	Rank	Score*
Firm-level technology absorption	1	6,6	9	6,1
FDI and technology transfer	71	4,1	86	4,5
State of cluster development	1	5,7	7	5,3
Quality of scientific research institutions	2	6,3	13	5,6
Property rights	3	6,5	4	6,5

* Score is on scale 1 (unsufficient) to 7 (optimal)

Source: World Competitiveness Report 2001 and 2009

The above measurements describe the technological readiness and innovative capacity that measure the ability to adopt existing technologies and has a strong relationship to a country's overall competitiveness (World economic Forum 2009). The results indicate that companies in Finland should improve their ability to absorb external technology. Enhanced utilization of outside technologies combined with strong innovation capabilities would allow Finnish companies to become more competitive, which is a step towards a more competitive economy. Innovation stimulates productivity that creates the basis of nation's standard of living and thus competitiveness (Porter 2003). Regaining Finland's competitiveness requires radical innovation that can typically only be created through "combining different knowledge sources in a unique manner", which takes place through inter-company linkages (Kosonen 2008). Porter (2000) emphasizes that competition rests on innovation and the search of strategic differences where close linkages with buyers, suppliers and other institutions are important for efficiency as well as for the rate of improvement and innovation.

2.3. Resources

“Resources are inputs into the production process” states Grant (1991). The types of resources that are being transferred through linkages determine the structure of the partnerships (Chen and Chen 2003). While the beginning of this chapter will introduce the types of resources, the remaining section discusses which resources are the most likely shared between MNEs and locally based companies in Finland and sets the first hypothesis (H1). Understanding them allows us to comprehend how MNEs contribute to locally based companies in Finland as well as what they seek to gain from their investment.

Resources can be categorized based on various theories. Chen et al. (2004) identify three categories of resources: basic, strategic and knowledge resources. Basic resources include unskilled labor and natural resources. Strategic resources consist of internalization assets, local supporting industry networks, skilled and professional workers and domestic markets. Third, knowledge resources are R&D capabilities, manufacturing technologies, marketing know-how, managerial expertise and organizational strength. Strategic and knowledge resources are rather demanding to establish in a new location and thus relationships with local actors are essential unless they are simply acquired by the subsidiary. (Chen et al. 2004)

Barney (1991) divides companies' resources another way into three categories: physical capital, human capital and organizational capital, whereas Das and Teng (1999) divide them into physical, financial, human, technological, managerial, and organizational resources. Das and Teng (1999) further argue that the classifications should be initially divided based on their nature into property and knowledge based resources that were originally introduced by Miller and Shamsie (1996). Properties differ from knowledge because a company has a clear ownership of that resource and it is protected by law, such as physical assets or patents (Miller and Shamsie 1996). Knowledge, however, is

more difficult to defend and it is protected solely by knowledge barrier (Das and Teng 1999).

Das and Teng (1999), however, argue that property resources are often considered more valuable because knowledge is more difficult to transfer to another company. The authors continue that resource contribution to a partner often consist of either primarily property or primarily knowledge resources but not both equally as much (Das and Teng 1999). Nevertheless, the world is changing and if technology was sufficient to create competitiveness in 20th century, it certainly is not anymore. Knowledge is more comprehensive than technology (Saliola and Zanfei 2008) and it is a key source of advantage for MNEs (Scott-Kennel 2007b).

Knowledge can be further divided into two widely used concepts, explicit and tacit knowledge. The former comprises of processes and other artifacts, even public goods, which are easy to codify and thus transfer. The latter, on the other hand, refers to know-how and experiences that people possess but they are difficult to demonstrate on paper and therefore more difficult to transfer. (Polanyi 1962). Another classification of knowledge is done by Rolland et al. (2003) who divides knowledge into technical and managerial related knowledge.

Chen and Chen (2003) criticize that resources in general are difficult to measure and therefore they divided them based on their functions: R&D, production and marketing. The survey used in this thesis combines the resource categorizations of Chen et al. (2004), Barney (1991), Das and Ten (1999), Rolland et al. (2003), and Chen and Chen (2003) and categorizes the results as follows: (1) technical know-how, R&D, and innovation, (2) organization and management know-how, (3) marketing know-how and market information, and (4) training and development of human resources.

Existing levels of host country technological and structural development determines what types of linkages will be the most appropriate (Narula 1996). The extensive R&D

investments in Finland have created numerous technology-intensive companies, especially in the ICT sector in order to integrate the know-how of the Finnish companies in their own operations. (Pajarinen and Ylä-Anttila 1999).

MNEs perform R&D activities mainly in their home country (Benito et al. 2003, Chen et al. 2004, Dachs et al. 2007, Castellani and Zanfei 2007) but also in other developed countries (Maher and Christiansen 2001). Foreign R&D is needed in order to localize MNE's products and gain access to local technology and competencies but not all regions are equally attractive for R&D investments (Castellani and Zanfei 2007). According to Pajarinen and Ylä-Anttila (1999), companies are seeking to attain strategic and knowledge resources in Finland. Foreign subsidiaries that perform R&D activities in Finland appreciate technological know-how as Finland's most important competitive advantage (Lindström 2004). Since Finland is strong in innovations and R&D (Sölvell and Porter 2002, Steinbock 2006), it is highly probable that domestic and foreign MNEs are aiming to retrieve mainly those competencies from locally based companies by creating linkages with them.

As the R&D competencies of Finnish companies are emphasized, it should be noted that MNEs are also one of the most significant players worldwide in terms of technology creation and control (Maher and Christiansen 2001). Recent literature links R&D, innovation and FDI strongly together and MNEs are seen as a driving force for the globalization of innovation and R&D activities (Dachs et al. 2007). Out of top 700 R&D spenders in the world, 98 percent are MNEs and they create 69 percent of the world's business R&D (Castellani and Zanfei 2005). The importance of MNEs in worldwide R&D is so significant that it is likely that they are transferring R&D related resources to their business partners in Finland. Resources received and transferred are analyzed separately in the first hypothesis to grasp the true nature of linkages. Thus, the first hypothesis is divided in two parts.

Hypothesis 1a (H1a): *In terms of quality and quantity, MNEs are more likely to receive R&D than any other types of resources from local companies in Finland.*

Hypothesis 1b (H1b): *In terms of quality and quantity, MNEs are likely to transfer R&D than any other types of resources to local companies in Finland.*

2.4. Inter-company Linkages

Successful inter-company relationships help companies to create rare and imperfectly imitable resources by combining companies' unusual market power and prestige (Barringer and Harrison 2000). More importantly, formation of relationships that go beyond market based transactions within local country contexts as well as internationally contributes to a broader resource base with which to compete. The first part of this section is dedicated to distinguish linkages from traditional market-based transactions by dissecting them in light of previous literature.

Second, part introduces different types of linkages that are supply chain, collaborative as well as institutional linkages (Giroud and Scott-Kennel 2009). Whether MNEs' inter-company resource exchange occurs mainly with MNEs' suppliers (backward), buyers (forward) or other partners (relational) in Finland is examined. As mentioned earlier in this chapter, typically literature focuses to a single linkage type of linkage, mainly local sourcing with suppliers, than combinations of multiple linkages (Scott-Kennel 2007a) and thus this research will contribute to the existing literature by considering combinations of linkages in the Finnish context. An adequate understanding of the linkage types is essential in order to comprehend how linkages work.

2.4.1. Dissecting Linkages

Linkages are formal and informal cooperative exchanges of material and immaterial resources between legally independent companies (Hansen and Schaumburg-Müller 2006) in which resource exchange between them is intended (Scott-Kennel 2007b). The aim of this section is to distinguish linkages from traditional market-based transactions, and demonstrate the elements that form linkages. Linkages are cooperative inter-company relationships, in which MNEs externally transfer certain ownership-specific resources that, according to Scott-Kennel and Enderwick (2004), include core advantages, knowledge and operating resources. Traditional market-based transactions, however, are transactions in which buyers and sellers interact through spot-market transactions or selling outright, and on-going inter-firm relationships, cooperation and communication that is limited at best. The buyer and seller do not have obligations with respect to their future behavior so the transaction is pure market transaction (Richardson 1972). To summarize, linkages are different from normal market transactions (Castellani and Zanfei 2006) because they are not spot market transactions, arms-length trade relations or off-the-shelf sales (Hansen and Schaumburg-Müller 2006).

Creating linkages with partners that have complementary capabilities enables companies to gain access to operational and strategic assets and thus respond to challenges of rapidly globalizing world where rapid repositioning is critical for competitive success (Nohria and Garcia-Pont 1991). Foreign corporations form linkages with local companies through supplier, marketing, research and development (R&D), labor, subcontracting, and financial relationships (Chen et al. 2004). Exchange can involve multiple resources, such as “payments, products, technology, process, knowledge, expertise, assistance, and access to markets and contacts” (Scott-Kennel 2007a).

Cooperative inter-firm agreements, such as strategic alliances and partnerships, are becoming more important for MNEs when creating competitive advantages and

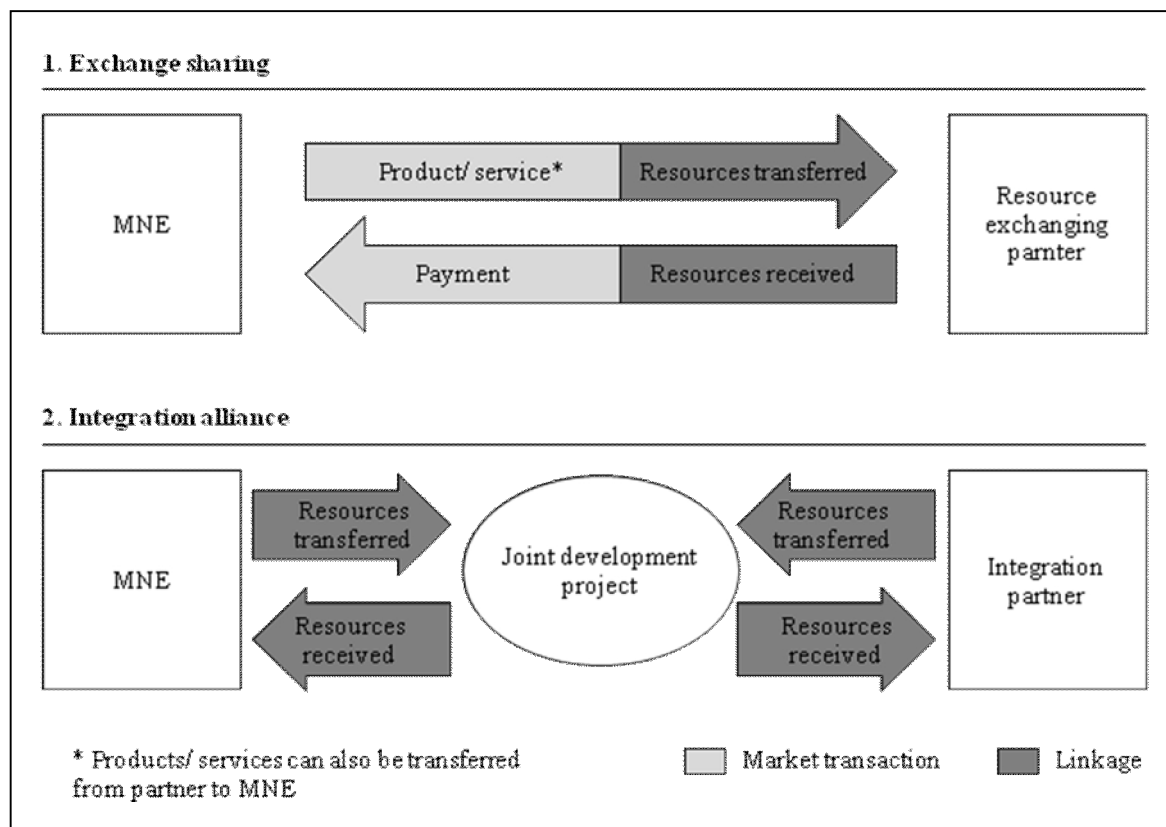
excelling amongst strong competition. Partnering via strategic alliances ideally creates collaborative working relationships that are supported by social, economic, service, and technical ties as well as generate mutual benefit and value across the organizations (Buono 2003). MNEs and local firms are being increasingly more dependent on each other since the linkages between them are one of the key channels through which knowledge and spillovers¹ flow to host economy (Saliola and Zanfei 2007). Basic requirements for partnerships and alliances are a shared vision, clear communication, inter-firm trust and collaborative sharing of expertise (Buono 2003). Similarly, Castellani and Zanfei (2006) remind that knowledge flows via durable and effective linkages need to be well organized, which requires serious dedication and favorable environment.

Chen and Chen (2003) distinguish two types of inter-company cooperation visualized in Figure 2.2: exchange sharing and integration alliances. The former refers to a partnership where each partner performs its core competencies internally and shares activities with secondary importance externally with partners, similarly to outsourcing. These linkages centered on transactions are typically vertical relationships (see Giroud and Scott-Kennel 2006). New technologies materialize either in the intermediate goods that local companies use in production or by a transferee obtaining rights to use the

¹ *Spillovers* take place when MNEs have an impact on host country companies unintentionally and they are not able to benefit from resource leakage to or subsequent usage of transferred resources by local firms (Smarzynska 2002). Technology conveys from foreign affiliates to local companies by observing the foreign venture's operations (Smarzynska Javorcik and Spatareanu 2008), through reverse engineering, skilled employment turnover, local agent contacts and increased technology standards (Fotopoulos and Louri 2002), demonstration effects, participation in local trade (Dunning and Lundan 2008) or through linkages with local buyers or suppliers that exclude direct technology transfer (Maher and Christiansen 2001). They lead to locally based companies' higher efficiency and growth.

technology by license agreements et cetera (Vuori 1995). This straightforward technology transfer occurs often when a MNE transfers technology to their intermediate suppliers or buyers (Maher and Christiansen 2001). The light gray area in the linkages in Figure 2.2 illustrates a market transaction and dark grey are illustrates the resources exchanged through linkages.

Figure 2.2. Two types of cooperation: Exchange sharing and integration alliance



The integration alliances, conversely, are more than an exchange of resources where a MNE forms an integrative partnership with a host country company by pooling their resources to serve a common purpose and create synergies (Chen and Chen 2003). They

involve direct inter-company relationship instead of transactions and are typically built with horizontal partners (see Giroud and Scott-Kennel 2006). The authors specify that these direct relationships include alliances, technology sharing agreements, management contracts and co-production. The company integration associated with alliances is comparable to the concept of quasi-internalization of resources introduced by Scott-Kennel and Enderwick (2004) where a MNE subsidiary transfers ownership-specific resources externally to another firm. The partners then jointly further develop the assets being transferred but there are no ownership ties involved between the partners (Scott-Kennel and Enderwick 2004). Luostarinen (1981a) argues that co-operative deals (integration alliances) do not include buyer-seller relationships at all unlike know-how sales contracts (exchange sharing) do. The author also underlines that international joint collaboration does not include a joint establishment of a new unit (eg. a joint venture) but only agreements related to shared development or transfer of know-how and practices between the parties.

As Table 2.1 shows, MNEs and their partners both benefit from inter-company linkages (Giroud and Scott-Kennel 2009). Resources shared by a MNE benefit the MNE itself through enhanced input, delivery, or radical innovations depending on whether the resources are transferred to MNE's suppliers, buyers or other partners. Partners strive to communicate, obtain, process, interpret and generate information dynamically via strong and weak ties with each other (Imai 1989). This research aims to bring more value to existing linkage literature by excluding spillovers and examining only voluntary resource exchange even though hardly any empirical studies separate these two (Blomström et al. 2000). Since spillovers are not within the scope of this study, they are not illustrated in Table 2.2.

2.4.2. Types of External Linkages

In order to examine resource transfer via inter-company linkages, the types of linkages need to be understood. Linkages that are created with external players can be divided into three main types: supply chain, collaborative and institutional linkages (Giroud and Scott-Kennel 2009).

Supply chain linkages are also called transactional or vertical linkages because they increase transactions with partners and other entities that participate in the vertical supply chain (Scott-Kennel 2004, Giroud and Scott-Kennel 2009). They take place when the value chain is still coordinated by a MNE but everything outside its core competencies is outsourced to other companies (Dunning and Lundan 2008). The other companies are disintegrated from the MNE (Atallah 2006) and the MNE is monitoring the value chain and its members but it is not controlling nor managing them (Dunning and Lundan 2008). This type of decentralization has become rather popular among MNEs because it better meets the flexibility requirements of the technological development, globalization and competitive pressures (Acemoglu et al. 2005).

Supply chain linkages can be either backward linkages with suppliers and subcontractors that produce intermediate inputs to MNE or forward linkages with customers and agents who produce final goods or distribute the products (Scott-Kennel 2004). Backward linkages are particularly associated with international production networks in which MNEs relocate the network by shifting production to different foreign countries where local companies can link to these networks as original-equipment manufacturers and subcontractors (Meyer 2004). Ivarsson and Alvstam (2005) argue that MNEs transfer mainly technical assistance to their suppliers through backward linkages. They specify that product related know-how, such as designs or technical specifications, is often transferred through patents and licenses, while process related know-how, such as machinery and equipment related knowledge, is transferred through technical support and quality management. The authors further argue that

MNEs also assist their suppliers by transferring managerial and organizational know-how. Ivarsson and Alvstam studied Swedish MNEs' suppliers in developing countries, which highlights the knowledge transfer need from MNEs to local suppliers. However, both domestic companies and MNEs tend to benefit from backward linkages (Smarzynska 2002) and especially in more advanced countries suppliers likely have technical competencies that they can also transfer to MNEs.

Forward linkages are supply chain linkages with buyers and agents. They are generated through local market penetration as well as information flow between the subsidiary and the users of its output (Blyde et al. 2004). According to Dunning and Lundan (2008), there are three types of forward linkages. The first occurs with parties that are acting in secondary processing of primary value added activities performed by a MNE. The second type of linkage occurs when connections are established with individual buyers of technologically complicated products. Linkages with marketing outlets form the third types of forward linkages (Dunning and Lundan 2008). Therefore, customers can be either end users or middlemen that are distributing the products or services. Agents do not purchase any products and services from MNEs like customers do, but they often share resources with them in order to better serve their customers.

Literature robustly suggests that MNEs are more likely to transfer knowledge to their local suppliers (backward) than buyers (forward) via vertical linkages (Castellani and Zanfei 2006, Alfaro and Rodriguez-Clare 2004, Javorick and Spatareanu 2008, Blyde et al. 2004, Smarzynska 2002). However, in addition to voluntary resource transfer, some of these studies include spillover effects that are involuntary resource diffusion to local companies. Since spillover effects are excluded from this thesis and only voluntary inter-company resource transfer is measured, some of the linkage literature cannot be directly applied here. However, Rugman and Verbuke (2004) also argue that it is easier to achieve a firm specific advantage in backward global sourcing of R&D outputs, raw materials and labor than in forward sales distribution channel.

The second linkage type defined by Giroud and Scott-Kennel (2009) is collaborative linkages. They are also called horizontal or relational linkages and refer to collaborative activities with locally-based competitors and business partners that are often alliances and other inter-company network relationships (Giroud and Scott-Kennel 2006). They do not involve competitive effects because that would be classed as spillovers (*ibid*), which are excluded from this thesis. Collaborative linkages are continuous cooperation between companies and consist of voluntary technology sharing or development agreements, managerial contracts or other non-equity agreements (Scott-Kennel 2007a). They are established in form of joint ventures, strategic alliances and other non-equity collaborative agreements (Castellani and Zanfei 2005).

While supply chain, especially backward, linkages have received a large amount of attention in the literature, only a limited amount of studies include collaborative linkages to their scope. Iammarino et al. (2009) studied technological companies in the UK and found that innovations are reinforced with collaborations along the value chains, not horizontally with competitors or consultants because rivalry is too dominant. Also Blyde et al. (2004) argue that MNEs benefit when knowledge diffusion reaches their suppliers as well as clients and as a consequence they encourage vertical flows of general knowledge. Collaborative alliances are less trusting to their partners compared to vertical alliance partners and therefore the cooperation is often weaker (Rindfleisch 2000). However, collaborative alliances are becoming more important as the technology develops and in-house R&D development is often not sufficient to create competitive innovations today (Sabel and Saxenian 2008). Strategic alliances combine complementary but dissimilar resources, which enhance both companies' resource base when coordinated (Richardson 1972). Horizontal and dynamic value chains are becoming to substitute vertical supply chains (Hakonen et al. 2009). Collaborations especially between high-tech companies are becoming more common in Finland through governmental support programs (see *ibid*).

The third linkage type is institutional linkages, which are formed with governments, industry organizations, universities and other research institutes (Giroud and Scott-Kennel 2009). This thesis measures linkages creation between MNEs and locally based companies and therefore does not examine institutional linkages.

Palmgren et al. (2000) studied innovation creation in Finland during 1980s and 1990s in the Sfinno project. They found that on average, 87 percent of all innovations were developed in some type of cooperation. The most important cooperation partners were domestic customers, which 66 percent of the innovation creators listed as important or very important on development of innovations. Only 34 percent of the respondents listed domestic subcontractors, and 4 percent listed domestic competitors important or very important (Palmgren et al. 2000). The results indicate that forward linkages with customers are stronger than backward linkages with buyers. The Sfinno project also found that customers' demand and observation of market niche were by far the main factors contributing to the origin of innovation while new technologies were the third most important factor (Palmgren et al. 2000). The results of the Sfinno project strongly suggest that vertical, and especially forward linkages, with local partners are the most important in creating innovations.

However, also the Sfinno Project neglects to address the importance of collaborative partnerships. They have included only horizontal competitors and consultants that were not found to be important in cooperative development of innovations. The fact that foreign studies strongly emphasize the importance of backward linkages while a Finnish study found that forward linkages are the most valuable might result from different levels of reference countries' technological advancement. Local suppliers in an advanced country, such as Finland, might not need MNEs' technical assistance as much as companies in developing nations do while MNEs can focus on jointly developing innovations based on customers' demand. Therefore forward linkages, thus resources transferred and received by MNEs, are assumed to be of higher quality than backward or collaborative linkages in developed nations.

Hypothesis 2 (H2). *Resource exchange is more likely to occur with buyers (forward) than with suppliers (backward) or with other business partners (relational).*

2.5. Firm-level Determinants of MNEs' Ownership

The purpose of this section is to examine whether Finnish (domestic) or foreign MNEs are more likely to share resources via linkages with locally based companies. Existing literature strongly agrees that MNEs tend to keep the most important activities, especially R&D and innovation, close to their headquarters (Dachs et al. 2007, Castellani and Zanfei 2007). Therefore domestic cooperation partners are more important than foreign ones in developing innovation, and that collaboration is done within the domestic value chains with local customers and subcontractors (Luukkainen and Pentikäinen 2000, Niinen et al 2000). Lindström (2004) found that originally Finnish companies that had been acquired by a foreign company did more collaboration with Finnish universities and other research agencies than wholly foreign owned (Greenfield) companies. Especially the companies that had R&D investments in Finland cooperated with the research agencies (*ibid*). Regrettably the research did not explore the relationships with local business partners.

Besides R&D resources, multiple researchers are coherent in arguing that domestic MNEs, given that most core competencies still reside at home, will have the highest likelihood of resource transfer to local partners (Benito et al. 2003, Chen et al. 2004) and local equity participation affects more positively to linkage creation than a wholly foreign owned subsidiary (Chen et al. 2004, Javorcik and Spatareanu 2008). Javorick and Spatareanu (2008) found that having some domestic ownership affects positively especially local producers in the supplying sectors. In fact, the authors argue that wholly foreign owned subsidiaries are not a source of any vertical spillovers.

The reason why joint foreign and domestic ownership ventures may be more likely to commit in local sourcing than wholly foreign owned affiliates is that they may have lower costs in finding local suppliers (Javorick and Spatareanu 2008) and have existing connections and linkages that they can utilize for new joint ownership ventures (Chen et al. 2004) whereas wholly foreign owned affiliates rely more on imported inputs (Smarzynska 2002).

Hypothesis 3 (H3): *Finnish MNEs are more likely to engage in linkages with locally-based companies in terms of quality, quantity and type than foreign MNEs.*

2.6. Firm-level Determinants of MNE's Cluster Membership

“A cluster is a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities” (Porter 1998). Porter's cluster theory has become a standard concept in business field (Martin and Sunley 2003) and it is a widely researched topic. However, more empirical research is needed to measure if MNEs locate to competitive host country clusters in order to gain local competencies through inter-company linkages (Ivarsson 1999). This section reviews first literature of clusters and their influence to resource transfer and then focuses on Finnish clusters. The fourth hypothesis is set in the end of this section.

2.6.1. Clusters

Clusters are centers of excellence where interconnected companies generate synergies and create thus more value than they would achieve alone (Porter 1980). Porter's cluster theory is developed based on Marshall's concept of agglomeration economies introduced in his well-known book, *Principles of Economics* first published in 1890. Marshall argued that companies perform better when they are geographically close to other companies in the same industry in so called industrial districts. However, clusters are not restricted to one industry in one location. They are functional linkages of locally configured value chains (Davis et al. 2009) and can be industrial or regional (see Porter). Interaction between companies can therefore occur locally but also over long distances (Feser and Bergman 2000). Simmie and Sennett (1999) aptly define innovative clusters as numerous interconnected companies having a high degree of cooperation, typically through supply chain and operating under the same market condition.

Companies and their supporting firms in clusters are linked through market and non-market interactions (Davis et al. 2009) in which localization is important in new knowledge creation because innovative work requires generation and exchange of knowledge that has not been transferable through codification (Sturgeon et al. 2008). Clusters offer a collective learning base where knowledge is created locally from interaction between local SMEs and domestic as well as foreign MNEs (Hervás-Oliver and Albors-Garrigós 2008).

Clusters are important tools in understanding how different sectors are interconnected to each other and analyzing the technology diffusion between them (Pentikäinen and Luukkainen 2000). The cluster theory suggests that clusters attract competition by increasing companies' productivity in the cluster, driving innovation and stimulating new businesses in the field (Porter 1990). Ivarsson's (2002) findings are in line with

Porter and the author argues that companies in highly competitive industries are more likely to engage in local innovation and form alliance and technology sharing agreements with domestic companies. Also Dunning and Cantwell (1987) argue that continuous local innovation attracts not only local firms but also other strong MNEs. In fact, MNEs invest in advanced regions in order to have their own R&D in close access to complementary technological development (Dunning and Cantwell 1987).

The cluster concept has been criticized of not providing a clear way of identifying the geographical scale or boundaries of a cluster (Simmie 2004) and ignoring the importance of internal organizational learning (Martin and Sundley 2003). According to Porter (1985), functional linkages within clusters can be within one single city or extend to groups of countries. Therefore clusters cannot be defined solely as geographical objects but instead their study should start from identifying the kinds of linkages that successful companies have formed and then assess how much these are restrained within particular locations (Simmie 2004). The author studied UK companies and found that market-leading innovative firms were more engaged in internationally distributed systems of innovation instead of local ones, given that there were concentrated areas in certain city-regions. This suggests that clusters are part of larger global value chains (GVC) that, according to Sturgeon et al. (2008), is a more useful analytical tool for focusing research on complex and dynamic global industries. In fact, global value chains are becoming more important in identifying how clusters are formed and function.

Clusters are often overlapping and resource transfer occurs also between clusters (Virtanen and Hernesniemi 2005, Hakonen et al. 2009). Multiple clusters form open entities that are formed by local SMEs and connected with domestic and foreign MNEs, which sustain the channels for knowledge transfer locally and globally (Hervás-Oliver and Albors-Garrigós 2008). Intra-cluster linkages are rich and efficient, while inter-cluster linkages provide access to novel information that is not available within the

cluster (Sturgeon et al. 2008). In fact, the most advanced innovations are formed in two or more clusters' collaborations (Virtanen and Hernesniemi 2005).

Clusters enhance competitiveness by stimulating the fast diffusion of new products and process technologies, helping suppliers' upgrade their offering through competition and intense R&D co-operation with customers, encouraging companies to develop links with local training and research centers (Simmie 2004). The author continues that all these factors can contribute to innovation as well as extend over international and local value chains. Thus it is likely that MNEs in clusters share more resources than MNEs in non-cluster industries.

2.6.2. Finnish Clusters

The Finnish Science and Technology Council created a Cluster Program in the early 1990s, which was created to develop the industrial clusters' innovative capacity by supporting cluster specific R&D efforts. The Cluster Program stimulated interaction and coordination between ministries, public and private research units, and companies in order to enhance Finland's competitiveness. (Sölvell and Porter 2002). The key clusters in Finland are ICT, forest, metal and chemical industries (Steinbock 2006). All these four clusters have in common that they are technology driven and strong in R&D (Steinbock 2007). In addition to these four key clusters introduced below, there are numerous smaller competitive clusters in Finland, e.g. energy and constructions (see Hakonen et al. 2009).

Forest cluster has originally been, and still is, the largest cluster in Finland and includes the pulp, paper and board industry; wood products industry; manufacturers of machines, equipment, and automation and control systems; chemical manufacturers; packaging industry; printing industry; energy generation; logistics and consulting; research institutes and universities serving the sector (Steinbock 2006). Steinbock continues that

close cooperation between the forest industry, equipment manufacturers, raw material suppliers and R&D is crucial in order to have high-quality products and success on the market. Most of the players in this sector in Finland are Finnish MNEs that have globalized since Finland joined the European Union (EU) in 1995. The Finnish forest cluster contributes almost 10 percent of the Finland's GDP and invests roughly 250 million euros annually in R&D.

In the 21st century, the Finnish information and communications technology (ICT) has become a strong industry cluster (Tekes 2008). Also a variety of electronic and electro-technical companies are included in the Finnish ICT sector. ICT cluster, especially electronic and electro-technical industries, invests heavily in R&D and, in fact, it covers over 80 percent of the total industrial R&D expenditure in Finland with 2.1 billion euros (Steinbock 2006). Nokia is the leading firm in this cluster and accounts for 45 percent of all private R&D in Finland (Sölvell and Porter 2002). Slightly over half of Nokia's R&D activities were located in Finland in 2000 even though the sales in Finland formed only a small share of the company's total sales (*ibid*). It can be argued that Finland offers a competitive location for Nokia's R&D, otherwise it would have moved the activities elsewhere.

Finland's metal cluster includes also mechanical engineering industry and consists of forest and paper industry machines; mining and quarrying equipment; forest and agricultural tractors; ships; lifts; hoists; diesel motors; valves and power stations. Machinery production is the largest subsector in Finland. Metal cluster's R&D expenditure in Finland was 510 million euros in 2005. (Steinbock 2006)

The chemical cluster consist of various chemical product industries (including pharmaceutical industry), oil refining as well as manufacturing of plastic and rubber products. With 10 percent of the total industrial R&D investment, the chemical industry is one of the most research-intensive fields in Finland. The chemical industry invested 291 million euros in R&D in 2004. (*ibid*)

Multiple researchers argue that MNEs benefit from their subsidiaries located in small advanced economies with a presence of competitive clusters or leading firms (Porter 1998, Ivarsson 1999). Advantages that companies gain from clusters include higher productivity, growth, profitability and innovation (Simmie 2004). Considering clusters' strong collective learning base where knowledge is created locally from interaction between domestic or foreign MNEs and local SMEs (Hervás-Oliver and Albors-Garrigós 2008), it is likely that MNEs in cluster industries share more resources with local companies than MNEs in other industries. The importance of R&D in Finnish clusters has been emphasized but it is likely that also other resources are more shared by cluster MNEs because the four main clusters include traditional mechanic industries, forest and metal. Thus the expertise of Finnish clusters is not solely based on R&D competencies.

Hypothesis 4 (H4): *MNEs' operating in cluster industries are more likely to engage in linkages with locally-based companies in terms of quality, quantity and types than MNEs in non-cluster industries.*

2.7. Firm-level Determinants of Local Companies' Absorptive Capacity

Absorptive capacity refers to companies' ability to recognize, integrate, and productively use tangible and intangible knowledge transferred through linkages (Cohen and Levinthal 1990, Zahra and George 2002, Scott-Kennel 2007b). The amount of linkages determines MNEs' benefits to local companies because the more linkages there are between a foreign venture and local companies; the greater are the benefits for the local economy (Chen et al. 2004). Hence, the extent of knowledge transfer depends on actions of both firms, and is not quasi- automatic (Meyer 2004). In order for positive

effects from linkages to take place, local firms' competencies and absorptive capacity are necessary (Cantwell 1989, Kokko 1994).

The concepts of technology gap and absorptive capacity have been connected in recent literature and this section will first discuss Finnish companies' technology gap as well as absorptive capacity. The fifth and last hypothesis of this thesis is formulated at the end of the section based on the findings.

Technology gap refers to differences in transferor's and transferee's technological capabilities (Castellani and Zanfei 2005). There are diverse views on how the extent of technology gap affects to the expected benefits of technology transfer. On the one hand, a large technology gap between a MNE and domestic firm increases the domestic firm's learning from MNEs and positive externalities are likely to occur (Findlay 1978, see Castellani and Zanfei 2005). On the other hand, the lower the technology gap, the higher the domestic firms' absorptive capacity and they are able to utilize the technology received from the MNE (Dunning and Cantwell 1987, Schienstock and Hämäläinen 2001, see Castellani and Zanfei 2005). Put another way, opportunities for knowledge acquisition increase with the technology gap, but recipients' ability to use it declines (Meyer 2004) as their absorptive capacity is then inferior.

Local companies' competencies and absorptive capacity determine how capable they are to benefit from the linkages (Cantwell 1989, Kokko 1994). Technology gap and knowledge set similarities between transferor and transferee cannot be too overlapping. Literature suggests that in order for a knowledge transfer to take place, a MNE should have something to teach and the local firm should have something to learn (Castellani and Zanfei 2003, Blomström and Kokko 2004). Therefore, when a technology gap between MNEs and locally based companies is existing but small enough, complementary resources are equally shared. Görg and Strobe (2004) found that in high-tech industries, the larger the foreign presence, the more likely are the local companies to survive because they have the necessary absorptive capacity. High local

competencies combined with MNEs' cutting edge technological know-how are more likely to create positive spillovers to the local companies (Castellani and Zanfei 2006).

In addition to having existing own technological capability, local suppliers need to take initiative and have intense technology sourcing from MNEs in order to benefit from resource transfers (Jindra et al. 2008). Locally based companies' absorptive capacity can be measured by comparing the resource flow to and from MNEs. Finnish companies possess technological competencies due to their strong R&D capabilities and very skilled workforce thanks to the world's best primary education system (World Economic Forum 2009) and widely admired public research facilities (Sabel and Saxenian 2008). Finland also is number one in availability of scientists and engineers in the world (World Economic Forum 2009). Therefore, it is likely that Finnish companies have a high absorptive capacity and thus resource transfer from MNEs to local companies is as intensive as resource transfer from local companies to MNEs.

Hypothesis 5 (H5): *MNEs are likely to receive and transfer equally strong linkages in terms of quality, quantity and type with locally-based companies in Finland.*

The five hypotheses set in this section are tested with empirical research that is introduced in the next chapter. The data is tested in chapter four and chapter five discusses the findings in relation to literature introduced in this chapter.

3. Methodology

3.1. Introduction

This section illustrates the quantitative methodology used for collecting and analyzing data to answer to the hypotheses set in the previous chapter. First, the choice of methodology, a questionnaire, is validated followed by elucidating the questionnaire used in this thesis in order to demonstrate its thorough coverage of the matter being examined. Then, the procedures used to collect responses for the questionnaire, their response rates and overcoming the data collection problems are enlightened. The following section introduces the statistical analyses used to test the hypotheses set in chapter two. Finally, the validity and reliability of the study and justification for using SAS Enterprise Guide 4 to analyze the results are discussed.

3.2. Choice of Methodology

The research topic of this thesis examines inter-company linkages and the firm-level determinants that affect to that. MNE-level determinants analyzed are foreign ownership and industry cluster whereas local company-level determinant is their absorptive capacity. The data is obtained on a company-level and it targets inter-company linkages and purposeful resource transfer. As mentioned in the introduction section, modern MNEs are global inter-organizational networks that combine customers, suppliers, regulators and competitors to their own internal sources and gain valuable insights (Ghoshal and Bartlett 1990) and therefore the questionnaire used in this thesis is targeted directly to MNEs. Industry-level cross-sectional studies would not be sufficient to provide relevant company-level data for analyzing the direct resource sharing between MNEs and locally based companies in Finland.

Data used in this thesis is part of a GlobeConnect research project that examines large companies in small economies as well as their inter- and intra-company linkages by collecting primary data through surveys. The data for this research was collected only once so it is a cross-sectional study (Malhotra and Birks 2007) and was conducted via an empirical study of the top 500 firms in Finland. The data was purchased from Nordic Net database. The survey was sent to the top executives of 500 largest companies in Finland because the research planners, which are introduced in the following section, considered it the most suitable population element. Thus, the sample is chosen based on judgmental sampling (*ibid*). The top 500 firms were chosen based on their annual revenues, which were more than 105,539,000 EUR in 2007 (Nordic Net database). Among companies were Finnish MNEs, Finnish affiliates of foreign MNEs, solely domestic firms and foreign portfolio investment companies.

Structured data collection procedures, thus a formal questionnaire, with fixed-response alternative questions were used because they allow consistent data to be obtained and reduce the variability caused by differences in interviewers (*ibid*). The company listing and contact information were retrieved from NordicNet and cross-referenced with the Top 500 companies list produced by Talouselämä.

Considering Finland's small size, the Finnish MNEs are in general smaller than MNEs worldwide. Only 283 companies out of the 500 largest companies ranked by turnover in Finland have 500 or more employees (NordicNet database 2007). Even though every company that conducts business in more than one country around the globe is classified as a MNE (Czinkota et al. 2005), it is a rather wide concept and not all such companies can be evaluated based on the same criteria. MNEs strengths are their "superior efficiency as an organizational vehicle by which to transfer their knowledge across borders" (Kogut and Zander 2003) and very small organizations operating with minimal staff only in a few countries, are unlikely to have this superior efficiency in transferring knowledge across borders. Therefore the criteria for the companies included in the

analyses of this thesis is a minimum of 300 employees, of which at least 50 are required to be working outside Finland.

Globe Connect questionnaire was sent to top executives of the target group and 81 of them completed the whole survey, providing a useable response rate of 16.2 percent. Only 54 of them, however, can be analyzed in this thesis because 24 respondents had operations only within the Finnish borders or did not meet the qualification criteria of the size and level of internationalization. While setting minimum criteria for size, one respondent company was eliminated due to having only three employees outside Finland. It would not be appropriate to compare its linkage creation to large truly multinational companies that have a vast amount of staff located in foreign countries. In addition, three subsidiaries that did not meet the requirements in Finland were included in the study because they are part of large global MNEs and thus part of large knowledge networks. This results in 57 respondent MNEs.

The fact that 24 companies of 81 respondents (29.6 percent) were excluded from this thesis, does not have an effect to the response rate relevance because the target group of 500 companies also include a fair amount of companies that do not meet the same criteria. The respondents that were excluded from this thesis were companies that have operations only within the Finnish borders, such as government owned agencies or municipal electricity companies, so they are not MNEs and thus ineligible for this research. In addition to 57 responses, two respondents that had not completed the GlobeConnect questionnaire were included in this thesis because they had answered to the questions that are examined in this research. That is, 59 MNEs form a sample size in this thesis.

3.3. GlobeConnect Questionnaire

Data for this research was collected by using a GlobeConnect questionnaire that was created by Dr. Joanna Scott-Kennel (Victoria University of Wellington), Dr. Axele Giroud (Manchester Business School) and Dr. Fabienne Fortanier (Amsterdam Business School) who were referred as research planners in the previous section. They are conducting a larger international study on “Large Companies in Small Economies”. The study has been conducted in Finland, New Zealand, Ireland and the Netherlands. This thesis will only take into account responses from Finland (See Appendix A for the complete questionnaire, p. 116-125).

The questionnaire was translated in Finnish in order to improve the response rate and avoid misunderstandings due to language barrier. The initial translation was done parallel by three Masters’ students at the Helsinki School of Economics who compared the translations and made modifications in order to reach a consensus. This is called parallel translation (Malhotra and Birks 2007). Then a person whose native languages are Finnish and English translated the questionnaire back to English. This procedure is called back translation and it is suggested to be done in order to avoid errors in certain words or phrases (*ibid*). The questionnaire was also proofread and pre-tested with current and former International Business department staff members of the Helsinki School of Economics in order to assure that the questions were comprehensible. Certain improvements were done based on the feedback.

As mentioned in the previous section, the questionnaire was sent to 500 largest companies on Finland. The majority of questions asked respondents for their opinions using 7-point Likert attitudinal scales, while others asked for specific percentages or numbers (eg. R&D as a percentage of sales, employee numbers etc.). There was also opportunity for respondents to specify answers not provided and to select “do not know” as a response in most instances. 7-point Likert scales are superior to lessor point

scales and widely accepted as an appropriate survey instrument. They are itemized rating scales that are commonly used in profile analysis where mean values are calculated and compared with statistical analyses (Malhotra and Birks 2007).

The respondents were approached with a questionnaire that comprised of 7 sections and a total of 31 questions. The first section of the survey asked basic information about the company, such as the location of the global headquarters, number of employees in Finland and abroad, as well as share of foreign ownership. The purpose of the first section was to draw a general picture on the company's size, ownership and autonomy.

The next section concentrated on the firm's purchases and sales across regions. Input purchases and output sales were asked in order to better understand the linkages within the organization and scope of geographical distribution. The third section investigated the company's activities in Finland and outsourcing plans. The types of activities outsourced in Finland or abroad and those performed by the firm itself give an indication on the company's overall strategy and the path that it wishes to take in the future.

Business relationships are defined in the fourth section in order to examine the extent and importance of the linkages and resource contribution. First, the surveyed firms are asked to evaluate the benefits that business relationships offer for their company. Second, firms are being asked to evaluate how they contribute resources to the development of their business partners through regular interaction in the business relationships. In both cases the relationships have been further separated into suppliers, buyers and other business partners located in Finland, as well as business partners and company's internal units located worldwide. The fourth section contains the most important source of data for this thesis because its focus is on resource contribution via linkages.

The fifth section observes the attractiveness of business environment in Finland in fields of access to markets and resources, local conditions, business relationships as well as local rules and regulations. They are also asked to indicate how they change in the next three to five years. The sixth section focused on the firm's performance and competitive advantages in relation to local competitors in Finland. For example, they are asked what percentage of sales their company spends on R&D as well as marketing and sales activities. The seventh, and final section, examined strategy at the global corporate level in order to illustrate the company's worldwide strategy.

3.4. Data Collection Procedures

The surveys were collected through traditional mail surveys, Internet surveys and email surveys through traditional mail, calls and e-mails. The combination of these collection methods was used because there were challenges to receive enough responses. Due to detailed questions regarding the company's activities and future plans, a respondent in each company needed to be a chief executive officer (CEO) or other person in top management position.

An initial e-mail was sent mainly to CEOs of the top 500 firms in Finland on September 16th, 2008. The e-mail was written in English and also included a Finnish translation and a link to the questionnaire that was hosted by 2ask internet service for on-line surveys. Companies could choose to answer the questionnaire in English or in Finnish. Although a reminder e-mail was sent to all the companies, only 47 companies answered, which makes an initial response rate of 9.4 percent.

After the initial data collection round, roughly 200 companies were phoned by the three Helsinki School of Economics students and new links were sent via e-mail to those who promised to answer to the survey. CEOs were extremely difficult to reach due to traveling and their busy schedules. Some executives' e-mail address had been incorrect

in the database or the CEO had changed and thus a new questionnaire had to be directed to a correct person. This approach brought only a few more completed surveys. Many of those who were reached claimed that they did not have time to answer, got too many questionnaires already and were not cooperative to point the survey to anyone else in the company. The 500 largest companies are the most often targeted in various research projects and many had done a fundamental decision that they respond only to the surveys required by law. Some managers claimed that the questionnaire was too complex and required various people to answer the different parts while others argued that they were not appropriate companies to answer for the survey. Several companies also declined to answer because of privacy issues.

The next step was to directly contact the top executives' assistants in order to make them responsible for getting the survey filled out. If needed, they could also appoint the questionnaire to the right person or give contact details of another manager who would be more suitable to answer. This approach was slightly more successful than the previous round of calling but the number of received surveys was under 10.

Finally, the questionnaire was sent in paper version to 220 companies in order to raise the response rate. 13 completed surveys were received but there was a desperate need for foreign MNE's responses since the majority of the respondents were Finnish MNEs. In order to have a sufficient amount of foreign MNEs' answers, they were targeted at the last round of sent surveys. Out of 55 paper copies sent by mail to foreign MNEs, 5 returned their survey. The final response rate settled to 81 respondents, which makes the overall response rate 16.2 percent.

3.5. Statistical Analyses

The data was analyzed with MS Office and SAS Enterprise Guide 4. All the questions in GlobeConnect questionnaire used for this thesis were on a 7-point Likert scale, with

an option to select “not applicable” if needed. Likert scales are superior to lessor point scales and widely accepted as an appropriate survey instrument. They are itemized rating scales that are commonly used in profile analysis where mean values are calculated and compared with statistical analyses (Malhotra and Birks 2007). The respondents were asked to indicate “to what extent their firm contributes or benefits from resources transferred to their local suppliers, buyers, or other business partners” and the seven response categories varied from “not at all” to “to a great extent”. The resources are divided in four categories as mentioned in section 2.3. In order to be more concise, the resource categories are shortened so that R&D represents technical know-how, R&D and innovation resources; management represents organization and management know-how; marketing represents marketing know-how and market information resources; and HR represents training and development of human resources.

This thesis takes an exploratory approach to analyze the linkages based on the mean or proportion of resources transferred. Mean is the most common measurement of central tendency (Malhotra and Birks 2007). Each four resource categories (R&D, management, marketing and HR) as well as types of linkages (with suppliers, customers or other business partners) are treated separate in order to better understand the nature of resource transfer. For clarification, the mean differs from the median in a sense that the mean indicates the average value of all the answers and the median signifies the central tendency of which half the values fall above and half the values fall under (Malhotra and Birks 2003). Mean is used as part of testing all hypotheses on this thesis as a base for confidence intervals, t-tests and analysis of variance (ANOVA).

The first hypothesis aims to find out whether R&D resources are more likely to be received and transferred by MNEs than other resources in terms of quality and quantity. They are analyzed with confidence intervals calculated from means and proportions, respectively. Confidence intervals are used because they measure the range into which the true population value parameter will fall (Malhotra and Birks 2007) and they are

increasingly commonly used in statistics partly because they measure the size of the effect (Urdan 2005). The first hypothesis regarding linkages' quality analyses whether there are significant differences between the means of different resource types (R&D, management, marketing and HR) transferred via linkages. Confidence intervals are used because they allow comparing multiple means at the same time.

Table 3.1 indicates the variables used for the paired t-test, which are resources that MNEs receive and transfer with local suppliers, buyers and other partners. The description column indicates that all types of resources (R&D, management, marketing and HR) are measured separately for each type of linkages (with suppliers, buyers and other partners). The measurement scale for the questions is a 7-point Likert scale and the question number indicates to the GlobeConnect question that is measured in these analyses. The column on the right side indicates the question number in the GlobeConnet questionnaire (see Appendix A, p. 120-121)

Table 3.1. Variables used to measure linkage quality and quantity in H1a and H1b

Hypothesis	Variable tested	Description	Measurement scale	Question number
1a	Resources that MNEs receive from suppliers	Measures R&D, management, marketing and HR resources separately	Likert scale (1 = not at all, 7 = very much)	16
1a	Resources that MNEs receive from buyers			17
1a	Resources that MNEs receive from other partners			18
1b	Resources that MNEs transfer to suppliers	Measures R&D, management, marketing and HR resources separately	Likert scale (1 = not at all, 7 = very much)	21
1b	Resources that MNEs transfer to buyers			22
1b	Resources that MNEs transfer to other partners			23

The respondents had an option to answer “not applicable” when they were asked to measure the extent of transferring linkages on a 7-point Likert scale. These answers appear blank so they do not affect to the quality of linkages through the mean values. In order to capture the relevant picture of the linkages per se, it is absolutely crucial to measure the quantity of linkages.

There are different ways of measuring the quantity of linkages. One would examine the number or value of each company’s linkages. However, this would require a different approach than in Globe Connect survey by involving a more detailed company-level study. Another option would be to compare the number of respondent MNEs that transfer at least some resources externally through inter-company linkages to the number of MNEs transferring resources internally via intra-company linkages. This approach, however, would require more examination of the inter-company linkages that are excluded in this thesis. Third, the one used in this research, measures the proportion of MNEs transferring or receiving resources at least to some extent. More specifically, if the respondents indicated that their resource contributing or receiving on a 7-point Likert scale is 2 or higher, they are included among MNEs that contribute or receive at least some resources. The quantity is then analyzed with confidence intervals calculated from proportions because it measures the how many companies participate in the resource sharing activities with MNEs. Quality and quantity will indicate how frequently and how extensively MNEs receive and transfer resources via inter-company linkages.

The second hypothesis analyses the types of linkages, that is, whether MNEs are likely to exchange resources mainly with their suppliers (backward), buyers (forward) or other partners (collaborative). As was stated in section 2.1, quality is the most important measurement of linkage intensity and therefore the linkage types are also compared based on their quality. The differences are measured with paired difference t-tests. T-test is commonly used to make statements regarding means of parent populations

(Malhotra and Birks 2007) and to compare two means at the time (Ghauri and Grønhaug 2002). It is used especially for small samples of less than 30 but in practice it is often used in market research regardless of the sample size (Kajalo 2008). Paired difference t-test is conducted when the data for both samples relate to the same group of respondents (*ibid*), for example, whether MNEs are more likely to exchange resources with their suppliers or buyers.

Table 3.2 indicates the variables used for the paired t-test, which are resources that MNEs share with local suppliers, buyers and other partners. The description column indicates that all types of resources (R&D, management, marketing and HR) are measured separately for each type of linkages (with suppliers, buyers and other partners). The measurement scale for the questions is a 7-point Likert scale and the question number indicates to the GlobeConnect question that is measured in these analyses.

Table 3.2. Variables used to measure linkage type in H2

Hypothesis	Variable tested	Description	Measurement scale	Question number
2	Resources that MNEs share (receive and transfer) with suppliers	Measures R&D, management, marketing and HR resources separately	Likert scale (1 = not at all, 7 = very much)	16, 21
2	Resources that MNEs share (receive and transfer) with buyers			17, 22
2	Resources that MNEs share (receive and transfer) with other partners			18, 23

The third hypothesis identifies the effect that MNEs' foreign ownership has to inter-company linkages in terms of quality, quantity and type. Since both foreign subsidiaries

and local MNEs are included in the study, MNEs are divided in two groups based on the share of their foreign ownership. MNEs with up to 50 percent Finnish ownership are considered Finnish companies and MNEs with more than 50 percent foreign ownership are called foreign companies in this context. Quality of linkages in the H3 could be measured with confidence intervals as was done in H1 but it is measured with analysis of variance (hereafter ANOVA) instead, which is used to compare the means of more than two groups simultaneously (Ghauri and Grønhaug 2002). More specifically, one-way analysis of variance tests one categorical variable (Malhotra and Birks 2007) that in H3 is MNEs' ownership. One-way ANOVA measures the means of resources exchanged by the two different samples, Finnish and foreign MNEs. This is called dummy variable as Table 3.3 indicates. Twelve one-way ANOVA tests need to be done in order to cover the difference of Finnish and foreign MNEs' resources exchange quality (R&D, management, marketing and HR) transferred through three types of linkages (with suppliers, buyers or other partners).

Quantity cannot be tested with ANOVA because it is measured from proportions and therefore confidence intervals are used. Linkages types are also tested with confidence intervals. Table 3.3 indicates the variables used for H3.

Table 3.3. Variables used to measure linkage quality, quantity and type in H3

Hypothesis	Variable tested	Description	Measurement scale	Question number
3	Resources that MNEs share (receive and transfer) with suppliers	Measures R&D, management, marketing and HR resources separately	Likert scale (1 = not at all, 7 = very much)	16, 21
3	Resources that MNEs share (receive and transfer) with suppliers			17, 22
3	Resources that MNEs share (receive and transfer) with suppliers			18, 23
3	Ownership	Finnish vs. foreign MNE	1 = Finnish, 2 = foreign	Dummy variable

The fourth hypothesis explores whether MNEs in cluster industries are more likely to have stronger linkages than MNEs in non-cluster industries in terms of quality, quantity and type. Respondent MNEs were divided into five different segments based on their primary NACE Rev 2 code, which is a Pan-European acronym used for statistical classifications of economic activities (Eurostat, retrieved 31.8.2009). These cluster industries are: ICT, forest, metal, chemical and other industries (see Appendix B, p.125-126). MNEs that operate in multiple industries are ranked based on their primary business. ICT, forest, metal, chemical industries are the leading clusters in Finland and thus MNEs that operate on those industries were combined as “cluster industry MNEs”. All other industries were included in “non-cluster MNEs”.

Similarly to H3, quality is tested with one-way ANOVA, quantity with confidence intervals calculated from proportions and types of linkages with confidence intervals calculated from means. Table 3.4 illustrates the variables used.

Table 3.4. Variables used to measure linkage quality, quantity and type in H4

Hypothesis	Variable tested	Description	Measurement scale	Question number
4	Resources that MNEs share (receive and transfer) with suppliers	Measures R&D, management, marketing and HR resources separately	Likert scale (1 = not at all, 7 = very much)	16, 21
4	Resources that MNEs share (receive and transfer) with suppliers			17, 22
4	Resources that MNEs share (receive and transfer) with suppliers			18, 23
4	Cluster	cluster vs. non-cluster	1 = cluster, 2 = non-cluster	Dummy variable

The fifth hypothesis measures whether MNEs receive and transfer an equal amount of resources in terms of quality, quantity and type. The scope and quantity are measured with confidence intervals while quality is measured with paired t-test because there is one sample group whose two different responses (resources received and transferred by MNEs) are compared. Table 3.5 lists the variables tested for H5.

Table 3.5. Variables used to measure linkage quality, quantity and type in H5

Hypothesis	Variable tested	Description	Measurement scale	Question number
5	Resources that MNEs receive from suppliers	Measures R&D, management, marketing and HR resources separately	Likert scale (1 = not at all, 7 = very much)	16
5	Resources that MNEs receive from buyers			17
5	Resources that MNEs receive from other partners			18
5	Resources that MNEs transfer to suppliers	Measures R&D, management, marketing and HR resources separately	Likert scale (1 = not at all, 7 = very much)	21
5	Resources that MNEs transfer to buyers			22
5	Resources that MNEs transfer to other partners			23

Results from confidence intervals, paired t-test and analysis of variance (ANOVA) are reported in four levels of probability (see Coolican 1990, Kajalo 2008):

- Somewhat significant: 90 percent confidence level, $0.1 > p < 0.05$
- Significant: 95 percent confidence level, $0.05 > p < 0.01$
- Highly significant: 99 percent confidence level, $0.01 > p < 0.001$
- Very highly significant: 99.9 percent confidence level, $0.001 > p$

3.6. Reliability and Validity of the Study

The overall response rate of the survey used in this thesis, 16.2 percent, is sufficient enough for academically relevant study. According to Malhotra and Birks (2003), a response rate less than 15 percent might lead to serious bias.

The GlobeConnect questionnaire was delivered only for MNEs' executives, not for their business partners that are receiving resources from MNEs. Therefore it only measures MNEs' assumption of the extent and types of resources that they contribute to companies located in Finland. The second limitation of the questionnaire draws from the interval scale-based questions. Most of the responses are based on each respondent's own assumption of the extent of the resource transfer. Therefore what one respondent might consider being a significant amount, another might consider it more modest. However, as mentioned in section 1.7, the Likert-scale technique used in this survey is a widely accepted survey instrument particularly as it uses a 7-point scale (see Malhotra and Birks 2003). Also, since a top management executive in each company answered the questionnaire, the answers are assumed to be as reliable and valid for that firm as they can be. The survey was also translated into Finnish in order to reduce confusion and misunderstandings that respondents may face due to language barrier.

As explained earlier, the fourth hypothesis divides MNEs into ones that operate in cluster industries as well as in non-cluster industries. More specifically, it is examined whether MNEs that operate in one of the four main cluster industries in Finland (ICT, forest, metal and chemical) transfer more linkages than companies in other industries. It is important to note that even though a MNE operates in an industry that has a prominent cluster, it is not self-evident that the MNE is part of that cluster (Virtanen and Hernesniemi 2005). The questionnaire used in this thesis does not address this issue but there is an assumption that even though a MNE itself would not be an important player in the cluster, a cluster offers more highly competent partners and a MNE is

likely to take advantage of the concentrated partner network and thus participate in more intense resource transfer than MNEs in non-cluster sectors.

Table 3.6 illustrates the demographic distributions of the respondent MNEs. Foreign MNEs form the smallest sample size with 18 (30.5%) respondents, while Finnish companies form the majority with 41 (69.5%) respondents. When MNEs global operations are considered, only 11 MNEs are small or medium with less than 1000 employees whereas 26 (44.1%) MNEs have 1,000 to 10,000 employees and 22 (37.3%) MNEs have more than 10,000 employees. When the employees in Finland are examined, 37 (62.7%) MNEs have less than 1,000 employees, 20 (33.9%) MNEs have 1,000 to 10,000 employees and two (3.4%) MNEs have more than 10,000 employees in Finland. Cluster member MNEs included 34 (57.6%) MNEs in metal, forest, ICT and chemical industries while 25 MNEs (42.4%) form the non-cluster group.

Table 3.6. Sample demographics, N=59

Demographics	Description	Number of companies	Percentage of the total
Nationality	Finnish	41	69.5%
	Foreign	18	30.5%
Size of the global corporation	Medium- Large (<1,000 employees)	11	18.6%
	Large ($\geq 1,000$ employees)	26	44.1%
	Very large ($\geq 10,000$ employees)	22	37.3%
Size of the firm (Finnish HQ or foreign subsidiary) in Finland	Medium- Large (<1,000 employees)	37	62.7%
	Large ($\geq 1,000$ employees)	20	33.9%
	Very large ($\geq 10,000$ employees)	2	3.4%
Cluster	Metal	16	27.1%
	Forest	8	13.6%
	ICT	6	10.2%
	Chemical	4	6.8%
	Other	25	42.4%

The table shows that the sample demographics are rather diverse in terms of size and clusters. Numerous MNEs are large or very large globally and quite a few of them can be classified large also in Finland. As discussed in previously in this chapter, companies in Finland are smaller than they are in large countries and thus it was expected that the majority of Finnish companies or foreign subsidiaries in Finland have less than 1000 employees.

4. Empirical Findings

4.1. Introduction

This chapter illustrates the quantitative analyses conducted to measure the data received from the GlobeConnect survey that was introduced in the previous chapter. The objective is to analyze the data in order to test the five hypotheses that were set in chapter two. First, the types of resources that are likely to be transferred and received by MNEs in terms of quality and quantity (H1) are observed. Second, whether resource sharing in terms of quality is most likely to occur between MNEs and buyers (forward), suppliers (backward) or other business partners (collaborative) is tested (H2). Third, whether Finnish or foreign MNEs are more likely to share resources with local companies in Finland is examined in terms of quality, quantity and type (H3). Whether cluster or non-cluster MNEs are more likely to share resources with local companies in terms of quality, quantity and type is examined fourth.

The fifth and final part of this section tests whether resources are more likely to be transferred from MNEs to local companies or vice versa (H5). The aim is to identify whether the resources are equally shared between MNEs and companies located in Finland. Chapter 5 will then discuss the findings more in depth in relation to existing literature that was observed in the second chapter.

4.2. Linkage Quality and Quantity

Linkage quality and quantity are analyzed in order to understand the linkages more profoundly and answer to the first hypothesis. The types of resources received and transferred by MNEs to local companies are examined separately in order to measure whether there are differences between these two directions of resource flow.

The quality of the resources that MNEs receive from locally based companies is measured by the mean value and their confidence intervals in the top part of the Table 4.1. As the table indicates, we are 99% confident that, on average, MNEs receive more R&D (confidence interval for the mean of 3.524 – 4.036) than management (2.284 – 2.756), marketing (3.010 – 3.510) or HR (2.582 – 3.058). We are even more confident (with 99.9% confidence) that, on average, MNEs receive more R&D (3.454 – 4.106) than management (2.218 – 2.822) or HR (2.582 – 3.058), and more marketing (2.941 – 3.579) than management from local companies. When individual types of linkages are analyzed separately, we are 90% confident that, on average, MNEs receive more R&D (confidence interval for the mean of 4.167 – 4.813) than management (3.055 – 3.705), marketing (3.465 – 4.115) or HR (3.494 – 4.166) from their suppliers. We are 95% confident that, on average, MNEs receive more R&D (3.889 – 4.691) than management (2.448 – 3.132) or HR (2.671 – 3.329) from their buyers. We are also 95% confident that, on average, MNEs receive more R&D (confidence interval for the mean of 3.844 – 4.565) than management (2.709 – 3.331), marketing (2.990 – 3.710) or HR (2.966 – 4.3654) from their other partners. The results show strongly that MNEs are most likely to receive R&D from local companies and thus we found strong support for H1a.

The quantity of resources that respondent MNEs receive from local companies is measured by confidence intervals calculated from proportions. The second part of Table 4.1 shows the proportion of MNEs that receive at least some resources combined from local suppliers, buyers and other business partners. We are 90% confident that, on average, MNEs receive more often R&D than management resources (non-overlapping confidence intervals for the proportions of 0.841 - 0.921 and 0.728 - 0.831, respectively). When all three types of linkages (with buyers, suppliers and other partners) are measured separately, we find no differences at their proportions with 90% confidence.

Table 4.1. Quality and quantity of resources received by MNEs: Confidence intervals

Quality of linkages received by MNEs	Resource	mean	std. dev.	n	90% low	90% high	Significance	95% low	95% high	Significance	99% low	99% high	Significance	99.9% low	99.9% high	Significance
All linkages (from buyers, suppliers and other partners)	R&D	3.78	1.32	177	3.617	3.943	>all others	3.586	3.974	>all others	3.524	4.036	>all others	3.454	4.106	>Mgmt, HR
	Mgmt	2.52	1.22	177	2.369	2.671	<R&D, Mktg	2.340	2.700	<R&D, Mktg	2.284	2.756	<R&D	2.218	2.822	<R&D, Mktg
	Mktg	3.26	1.29	177	3.101	3.419	>Mgmt,HR	3.070	3.450	>Mgmt, HR	3.010	3.510	>Mgmt	2.941	3.579	>Mgmt
	HR	2.82	1.23	177	2.668	2.972	<R&D	2.639	3.001	<R&D	2.582	3.058	<R&D	2.516	3.124	<R&D
Linkages from suppliers	R&D	4.49	1.51	59	4.167	4.813	>all others	4.105	4.875	>Mgmt	3.984	4.996	>Mgmt	3.843	5.137	
	Mgmt	3.38	1.52	59	3.055	3.705	<R&D	2.992	3.768	<R&D	2.870	3.890	<R&D	2.729	4.031	
	Mktg	3.79	1.52	59	3.465	4.115	<R&D	3.402	4.178		3.280	4.300		3.139	4.441	
	HR	3.83	1.57	59	3.494	4.166	<R&D	3.429	4.231		3.304	4.356		3.157	4.503	
Linkages from buyers	R&D	4.29	1.57	59	3.954	4.626	>Mgmt, HR	3.889	4.691	>Mgmt, HR	3.764	4.816	>Mgmt, HR	3.617	4.963	>Mgmt, HR
	Mgmt	2.79	1.34	59	2.503	3.077	<R&D, Mktg	2.448	3.132	<R&D, Mktg	2.341	3.239	<R&D, Mktg	2.216	3.364	<R&D
	Mktg	3.96	1.63	59	3.611	4.309		3.544	4.376		3.413	4.507		3.262	4.658	
	HR	3	1.29	59	2.724	3.276	>Mktg	2.671	3.329	>Mktg	2.567	3.433		2.447	3.553	<R&D
Linkages from other business partners	R&D	4.21	1.39	59	3.912	4.508	>all others	3.855	4.565	>all others	3.744	4.676	>Mgmt	3.615	4.805	>Mgmt
	Mgmt	3.02	1.22	59	2.759	3.281	<R&D	2.709	3.331	<R&D	2.611	3.429	<R&D	2.497	3.543	<R&D
	Mktg	3.35	1.41	59	3.048	3.652	<R&D	2.990	3.710	<R&D	2.877	3.823		2.746	3.954	
	HR	3.31	1.35	59	3.021	3.599	<R&D	2.966	3.654	<R&D	2.857	3.763		2.732	3.888	<R&D

Quantity of linkages received by MNEs	Resource	p	n	90% low	90% high	Significance	95% low	95% high	Significance	99% low	99% high	Significance	99.9% low	99.9% high	Significance
All linkages (from buyers, suppliers and other partners)	R&D	0.881	177	0.841	0.921	>Mgmt	0.834	0.929		0.819	0.944		0.801	0.961	
	Mgmt	0.780	177	0.728	0.831	<R&D	0.719	0.841		0.699	0.860		0.677	0.882	
	Mktg	0.853	177	0.809	0.897		0.801	0.905		0.785	0.922		0.766	0.941	
	HR	0.836	177	0.790	0.882		0.782	0.891		0.764	0.908		0.745	0.928	
Linkages from suppliers	R&D	0.915	59	0.855	0.975		0.844	0.986		0.821	1.009		0.796	1.034	
	Mgmt	0.831	59	0.751	0.911		0.735	0.927		0.705	0.957		0.670	0.992	
	Mktg	0.915	59	0.855	0.975		0.844	0.986		0.821	1.009		0.796	1.034	
	HR	0.881	59	0.812	0.950		0.798	0.964		0.772	0.990		0.742	1.020	
Linkages from buyers	R&D	0.898	59	0.833	0.963		0.821	0.975		0.797	0.999		0.768	1.028	
	Mgmt	0.746	59	0.653	0.839		0.635	0.857		0.600	0.892		0.560	0.932	
	Mktg	0.864	59	0.791	0.937		0.777	0.951		0.749	0.979		0.717	1.011	
	HR	0.831	59	0.751	0.911		0.735	0.927		0.705	0.957		0.670	0.992	
Linkages from other partners	R&D	0.831	59	0.750	0.911		0.735	0.926		0.705	0.956		0.670	0.991	
	Mgmt	0.763	59	0.672	0.854		0.654	0.871		0.620	0.905		0.580	0.945	
	Mktg	0.780	59	0.691	0.868		0.674	0.885		0.641	0.919		0.602	0.957	
	HR	0.797	59	0.710	0.883		0.694	0.899		0.662	0.932		0.624	0.969	

The top of the Table 4.2 shows the quality of the resources that MNEs transfer to locally based companies. The table indicates that we are 99% confident that, on average, MNEs transfer more R&D (3.524 – 4.036) than management (2.284 – 2.756), marketing (3.010 – 3.510) or HR (2.582 – 3.058) to local companies (suppliers, buyers and other partners combined). This also represents the overall relationships when different types of resources transferred from MNEs to local suppliers, buyers and other business partners are examined separately. We are 99% confident that, on average, MNEs transfer more R&D (3.257 – 4.203) than management (2.231 – 3.129) to their suppliers. We are 99.9% confident that MNEs' transfer more R&D (3.727 – 5.133) than management (2.156 – 3.304) or HR (2.406 – 3.674) to their buyers. Additionally, we are 99% confident that MNEs transfer more R&D (3.320 – 4.320) than management (2.147 – 3.073) or HR (2.544 – 3.536) to other local partners. The results show that MNEs are more likely to transfer R&D than other resources to their local partners and thus we find strong support for H1b.

The quantity of resources transferred by MNEs via all three types of linkages (to suppliers, buyers and other partners) is measured in the second part of Table 4.2. When they are analyzed combined, we are 95% confident that, on average MNEs transfer R&D (confidence interval 0.788 – 0.896) more than management (0.573 – 0.715) or HR (0.645 – 0.779). When all types of linkages are tested individually, we are 99% confident that, on average, MNEs transfer more often R&D (0.791 – 0.937) than management (0.578 – 0.778) to their suppliers. Also, we are 95% confident that, on average, MNEs transfer more often R&D (0.777 – 0.951) than management (0.522 – 0.766) to their buyers. We find no differences between the frequencies of different types of resources transferred to other partners.

Table 4.2. Quality and quantity of resources transferred by MNEs: Confidence intervals

Quality of linkages transferred by MNEs	Resource	mean	std. dev.	n	90% low	90% high	Significance	95% low	95% high	Significance	99% low	99% high	Significance	99.9% low	99.9% high	Significance
All linkages transferred (to buyers, suppliers and other partners)	R&D	3.78	1.32	177	3.617	3.943	>All others	3.586	3.974	>All others	3.524	4.036	>All others	3.454	4.106	>Mgmt, HR
	Mgmt	2.52	1.22	177	2.369	2.671	<R&D, Mktg	2.340	2.700	<R&D, Mktg	2.284	2.756	<R&D, Mktg	2.218	2.822	<R&D, Mktg
	Mktg	3.26	1.29	177	3.101	3.419	>Mgmt, HR	3.070	3.450	>Mgmt, HR	3.010	3.510	>Mgmt	2.941	3.579	>Mgmt
	HR	2.82	1.23	177	2.668	2.972	<R&D, Mktg	2.639	3.001	<R&D, Mktg	2.582	3.058	<R&D	2.516	3.124	<R&D
Linkages to suppliers	R&D	3.73	1.41	59	3.428	4.032	>Mgmt, HR	3.370	4.090	>Mgmt	3.257	4.203	>Mgmt	3.126	4.334	
	Mgmt	2.68	1.34	59	2.393	2.967	<R&D	2.338	3.022	<R&D	2.231	3.129	<R&D	2.106	3.254	
	Mktg	3.15	1.51	59	2.827	3.473		2.765	3.535		2.644	3.656		2.503	3.797	
	HR	3.07	1.3	59	2.792	3.348	<R&D	2.738	3.402		2.634	3.506		2.513	3.627	
Linkages to buyers	R&D	4.43	1.64	59	4.079	4.781	>Mgmt, HR	4.012	4.848	>Mgmt, HR	3.880	4.980	>Mgmt, HR	3.727	5.133	>Mgmt, HR
	Mgmt	2.73	1.34	59	2.443	3.017	<R&D	2.388	3.072	<R&D	2.281	3.179	<R&D	2.156	3.304	<R&D
	Mktg	3.85	1.56	59	3.516	4.184		3.452	4.248		3.327	4.373		3.182	4.518	
	HR	3.04	1.48	59	2.723	3.357	<R&D	2.662	3.418	<R&D	2.544	3.536	<R&D	2.406	3.674	<R&D
Linkages to business partners	R&D	3.82	1.49	59	3.501	4.139	>Mgmt, HR	3.440	4.200	>Mgmt, HR	3.320	4.320	>Mgmt, HR	3.182	4.458	
	Mgmt	2.61	1.38	59	2.314	2.906	<R&D	2.258	2.962	<R&D	2.147	3.073	<R&D	2.019	3.201	
	Mktg	3.4	1.47	59	3.085	3.715		3.025	3.775		2.907	3.893		2.770	4.030	
	HR	2.76	1.29	59	2.484	3.036	<R&D	2.431	3.089	<R&D	2.327	3.193	<R&D	2.207	3.313	

Quantity of linkages transferred by MNEs	Resource	p	n	90% low	90% high	Significance	95% low	95% high	Significance	99% low	99% high	Significance	99.9% low	99.9% high	Significance
All linkages transferred (to buyers, suppliers and other partners)	R&D	0.842	177	0.797	0.887	>Mgmt, HR	0.788	0.896	>Mgmt, HR	0.771	0.913	>Mgmt	0.752	0.932	
	Mgmt	0.644	177	0.585	0.703	<R&D	0.573	0.715	<R&D	0.551	0.737	<R&D	0.526	0.762	
	Mktg	0.763	177	0.710	0.816	>Mgmt	0.700	0.826		0.681	0.845		0.658	0.868	
	HR	0.712	177	0.656	0.768	>R&D	0.645	0.779	<R&D	0.624	0.800		0.600	0.824	
Linkages to suppliers	R&D	0.864	59	0.791	0.937	>Mgmt	0.777	0.951		0.749	0.979		0.717	1.011	
	Mgmt	0.678	59	0.578	0.778	<R&D	0.559	0.797		0.521	0.835		0.478	0.878	
	Mktg	0.729	59	0.634	0.824		0.616	0.842		0.580	0.878		0.539	0.919	
	HR	0.746	59	0.653	0.839		0.635	0.857		0.600	0.892		0.560	0.932	
Linkages to buyers	R&D	0.864	59	0.791	0.937	>Mgmt	0.777	0.951	>Mgmt	0.749	0.979		0.717	1.011	
	Mgmt	0.644	59	0.541	0.747	<R&D	0.522	0.766	<R&D	0.483	0.805		0.439	0.849	
	Mktg	0.814	59	0.731	0.897		0.715	0.913		0.684	0.944		0.647	0.981	
	HR	0.729	59	0.634	0.824		0.616	0.842		0.580	0.878		0.539	0.919	
Linkages to business partners	R&D	0.797	59	0.711	0.883		0.694	0.900		0.662	0.932		0.625	0.969	
	Mgmt	0.61	59	0.506	0.714		0.486	0.734		0.446	0.774		0.401	0.819	
	Mktg	0.746	59	0.653	0.839		0.635	0.857		0.600	0.892		0.560	0.932	
	HR	0.661	59	0.560	0.762		0.540	0.782		0.502	0.820		0.458	0.864	

The results in Tables 4.1 and 4.2 indicate that R&D resources are most likely received and transferred by MNEs in terms of quality and often also in terms of quantity. Moreover, marketing resources are the second most likely to be received and transferred by MNEs while management resources are the least likely. The results indicate that the direction of resource transfer (received or transferred by MNEs) does not affect to the types of resources transferred via inter-company linkages. Thus, the analyses conducted in the next three sections measure the resource exchange and do not separate the resources based on whether they are received or transferred by MNEs but analyses them collectively.

4.3. Linkage Type

The second hypothesis, whether MNEs are more likely to exchange resources with their buyers, suppliers or other local business partners (other than buyers or suppliers) is analyzed with paired difference t-tests. First, all resource types (R&D, management, marketing, HR) transferred and received by MNEs are analyzed combined. The results in Table 4.3 show that we find no significant difference in the means of resources shared by respondent MNEs with their suppliers and buyers (3.53 and 3.52, respectively). However, both of these means are significantly higher than the mean of MNEs' resource sharing with other business partners (3.32) with at least 99% confidence.

Table 4.3. Differences of all resources shared with suppliers, buyers and other business partners: Paired t-test

All resources shared with:	Mean	St. dev.	All resources shared with:	Mean	St. dev.	All resources shared with:	Mean	St. dev.
Suppliers	3.53	1.55	Buyers	3.52	1.61	Suppliers	3.53	1.55
Buyers	3.52	1.61	Other local partners	3.32	1.45	Other local partners	3.32	1.45
Difference	0.01		Difference	0.20		Difference	0.24	
t Value	0.14		t Value	2.57		t Value	3.23	
Pr > t	0.885		Pr > t	0.011**		Pr > t	0.001***	
N	434		N	400		N	395	

Significance shown by ^=0.1 *=0.05. **=0.01. ***=0.001 level

Note: Resource transfer is measured on a Likert-scale ranging from 1 (no transfer) to 7 (very much resource transfer)

Sample size consists of four resource types transferred and received by MNEs.

Since the results illustrate resource sharing only in a general level when resources are combines, they are examined more in depth based on the four resource types: R&D, management, marketing, and HR. To test whether each of these resources is more likely to be shared with MNEs' suppliers, buyers or other partners we use with paired difference t-tests.

First, the differences of resource exchange between the respondent MNEs and suppliers as well as buyers are compared as the top row of Table 4.4 shows. We are 95% confident that, on average, management and HR are more shared with suppliers (means 3.04 and 3.46, respectively) than buyers (means 2.76 and 3.02, respectively). However, we are 95% confident that, on average, marketing is more shared with buyers (mean 3.91) than suppliers (mean 3.48). We find no significant difference between R&D shared with suppliers (mean 4.12) or buyers (mean 4.35).

Second, resources that MNEs exchange with buyers and other local partners are compared. The middle part of Table 4.4 indicates that we are at least 95% confident

that, on average, R&D and marketing are significantly more transferred with buyers (means 4.35 and 3.91, respectively) than with other local partners (means 4.02 and 3.38, respectively). We find no significant differences in MNEs' sharing management and HR with their buyers or local business partners.

Third, the bottom part of Table 4.4 compares the likeliness of resources exchanged with suppliers and other local business partners. We find significant differences that, on average, HR is more shares with suppliers (mean 3.46) than with other partners (mean 3.04) with 99% confidence. We find no significant results that R&D, management and marketing would be more likely transferred to suppliers or other local business partners. The results show partial support for H2, which will be further discussed in chapter five.

Table 4.4. Types of linkages compared: Paired t-test

	R&D		Management		Marketing		HR	
	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.
Suppliers	4.12	1.51	3.04	1.47	3.48	1.54	3.46	1.49
Buyers	4.35	1.60	2.76	1.34	3.91	1.59	3.02	1.38
Difference	-0.26		0.29		-0.44		0.46	
t Value	-1.51		2.09		-2.78		2.96	
Pr > t	0.133		0.039*		0.006**		0.004**	
N	110		106		109		109	
	R&D		Management		Marketing		HR	
	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.
Buyers	4.35	1.60	2.76	1.34	3.91	1.59	3.02	1.38
Other local partners	4.02	1.45	2.82	1.31	3.38	1.43	3.04	1.34
Difference	0.38		-0.05		0.55		0.09	
t Value	2.21		-0.46		3.44		0.62	
Pr > t	0.030*		0.643		0.001***		0.534	
N	100		97		99		99	
	R&D		Management		Marketing		HR	
	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.
Suppliers	4.12	1.51	3.04	1.47	3.48	1.54	3.46	1.49
Other local partners	4.02	1.45	2.82	1.31	3.38	1.43	3.04	1.34
Difference	0.08		0.17		0.11		0.45	
t Value	0.46		1.17		0.65		3.06	
Pr > t	0.643		0.244		0.517		0.003*	
N	101		98		100		101	

Significance shown by $\wedge=0.1$ *=0.05, **=0.01, ***=0.001 level

Note: Resource transfer is measured on a Likert-scale ranging from 1 (no transfer) to 7 (very much resource transfer)

4.4. MNEs' Ownership and Linkage Intensity

Since both Finnish and foreign MNEs are included in the study, this section will test the differences in their linkages with local companies, in terms of quality, quantity and type. As mentioned earlier in this chapter, the analyses measure resource exchange and thus include the resources received and transferred by MNE. Linkage quality is analyzed with one-way ANOVA whereas quantity and types are analyzed with confidence intervals.

Relationship between the quality of resources shared by domestic and foreign MNEs is measured by one-way ANOVA in Table 4.5. The table shows that even though Finnish MNEs do share slightly more resources than foreign MNEs do, we do not find them significantly different. The only significant difference we find is R&D resources with suppliers that we find to be more shared by domestic than foreign MNEs (means 4.31 and 3.67, respectively) with 95% significance level.

Quantity is measured by confidence intervals calculated from proportions. We find no significant differences between the quantity of different resources shared by domestic and foreign MNEs and therefore the table is in Appendix C (p.127).

Table 4.5. Relationships between MNE ownership and linkage quality: One-way ANOVA

Suppliers	<u>R&D</u>		<u>Management</u>		<u>Marketing</u>		<u>HR</u>	
	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.
Domestic	4.31	1.61	3.26	1.51	3.59	1.58	3.60	1.58
Foreign	3.67	1.39	2.83	1.48	3.44	1.68	3.67	1.26
F	4.90		1.03		0.02		0.98	
Significance	0.029*		0.313		0.877		0.324	

Buyers	<u>R&D</u>		<u>Management</u>		<u>Marketing</u>		<u>HR</u>	
	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.
Domestic	4.37	1.62	2.81	1.30	3.99	1.61	3.04	1.34
Foreign	4.06	3.05	2.83	1.50	3.56	1.42	3.25	1.32
F	1.88		0.18		2.70		1.52	
Significance	0.173		0.676		0.103		0.220	

Other local partners	<u>R&D</u>		<u>Management</u>		<u>Marketing</u>		<u>HR</u>	
	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.
Domestic	4.13	1.36	2.96	1.26	3.32	1.43	3.19	1.35
Foreign	3.75	1.65	2.69	1.45	3.56	1.56	2.88	1.29
F	1.63		0.70		0.48		0.79	
Significance	0.205		0.406		0.492		0.377	

Significance shown by ^=0.1 *=0.05, **=0.01, ***=0.001 level

Note: Resource transfer is measured on a Likert-scale ranging from 1 (no transfer) to 7 (very much resource transfer).

Full sample consists of 2x41=82 (resources contributed and received by MNEs) domestic MNEs and 2x18=36 foreign MNEs.

Sample sizes for individual ANOVAs vary slightly due to missing observations or lack of resource sharing.

The types of linkages in this third hypothesis are measured by confidence intervals calculated from mean values in order to test whether the types of linkages are different in terms of quality when exchanged by Finnish or foreign MNEs. As Table 4.6 presents, we find no significant differences in the means of R&D or management resources shared by domestic or foreign MNEs. We are 95% confident that, on average, domestic MNEs share marketing more with buyers (confidence interval for the mean of 3.642 - 4.338) than with other partners (confidence interval of 3.010 - 3.630). These values are not overlapping and thus we are 95% confident that domestic MNEs share marketing resources more likely with buyers than other partners. We find no such difference among foreign MNEs' marketing resource sharing. Also, we are 90% confident that domestic MNEs share HR more with suppliers (confidence interval of 3.313 - 3.887) than buyers (2.797 - 3.283). We are also 90% confident that foreign MNEs share more HR with suppliers (3.325 - 4.015) than other partners (2.526 - 3.234).

When the equivalent types of linkages, e.g. Finnish or foreign MNEs' marketing linkages with buyers are compared, we find no significant differences. This indicates that even though Finnish MNEs are likely to share more marketing with their buyers than other partners while foreign MNEs are not more likely to share marketing with buyers, we find no significant difference of domestic and foreign MNEs marketing exchanging behavior with their buyers. To conclude, we find no differences among quantity or linkage types, and only one significant difference among quality when comparing how MNEs' ownership effects to the resource sharing. Therefore we find very little support for H3.

Table 4.6. Relationship between MNE ownership and linkage type: Confidence interval

Resource	Independent variable	Linkages with	mean	std dev	n	90% low	90% high	Significance	95% low	95% high	Significance	99% low	99% high	Sign.	99.9% low	99.9% high	Sign.
R&D	Domestic	Suppliers	4.31	1.61	82	4.018	4.602		3.962	4.658		3.852	4.768		3.725	4.895	
		Buyers	4.37	1.62	82	4.076	4.664		4.019	4.721		3.909	4.831		3.781	4.959	
		Other partners	4.13	1.36	82	3.883	4.377		3.836	4.424		3.743	4.517		3.636	4.624	
	Foreign	Suppliers	3.67	1.39	36	3.289	4.051		3.216	4.124		3.073	4.267		2.908	4.432	
		Buyers	4.06	1.43	36	3.668	4.452		3.593	4.527		3.446	4.674		3.276	4.844	
		Other partners	3.75	1.65	36	3.298	4.202		3.211	4.289		3.042	4.458		2.845	4.655	
Management	Domestic	Suppliers	3.26	1.51	82	2.986	3.534		2.933	3.587		2.830	3.690		2.711	3.809	
		Buyers	2.81	1.30	82	2.574	3.046		2.529	3.091		2.440	3.180		2.338	3.282	
		Other partners	2.96	1.26	82	2.731	3.189		2.687	3.233		2.602	3.318		2.502	3.418	
	Foreign	Suppliers	2.83	1.48	36	2.424	3.236		2.347	3.313		2.195	3.465		2.018	3.642	
		Buyers	2.83	1.50	36	2.419	3.241		2.340	3.320		2.186	3.474		2.007	3.653	
		Other partners	2.69	1.45	36	2.292	3.088		2.216	3.164		2.068	3.312		1.895	3.485	
Marketing	Domestic	Suppliers	3.59	1.58	82	3.303	3.877		3.248	3.932		3.141	4.039		3.016	4.164	
		Buyers	3.99	1.61	82	3.698	4.282	>Other partners	3.642	4.338	>Other part.	3.532	4.448		3.405	4.575	
		Other partners	3.32	1.43	82	3.060	3.580	<Buyers	3.010	3.630	<Buyers	2.913	3.727		2.800	3.840	
	Foreign	Suppliers	3.44	1.68	36	2.979	3.901		2.891	3.989		2.719	4.161		2.519	4.361	
		Buyers	3.56	1.42	36	3.171	3.949		3.096	4.024		2.950	4.170		2.781	4.339	
		Other partners	3.56	1.56	36	3.132	3.988		3.050	4.070		2.890	4.230		2.704	4.416	
HR	Domestic	Suppliers	3.6	1.58	82	3.313	3.887	>Buyers	3.258	3.942		3.151	4.049		3.026	4.174	
		Buyers	3.04	1.34	82	2.797	3.283	<Suppliers	2.750	3.330		2.659	3.421		2.553	3.527	
		Other partners	3.19	1.35	82	2.945	3.435		2.898	3.482		2.806	3.574		2.699	3.681	
	Foreign	Suppliers	3.67	1.26	36	3.325	4.015	>Other partners	3.258	4.082		3.129	4.211		2.979	4.361	
		Buyers	3.25	1.32	36	2.888	3.612		2.819	3.681		2.683	3.817		2.526	3.974	
		Other partners	2.88	1.29	36	2.526	3.234	<Suppliers	2.459	3.301		2.326	3.434		2.173	3.587	

4.5. MNEs' Cluster Membership and Linkage Intensity

The relationship between MNEs cluster membership and linkages are tested as they were in the previous section: quality is analyzed with one-way ANOVA, quantity and linkage types with confidence intervals.

The variance between the quality of resources exchanged by cluster and non-cluster MNEs is measured by one-way ANOVA. As Table 4.7 shows, we are 99% confident that cluster MNEs are more likely to exchange R&D with their buyers than non-cluster MNEs (means 4.73 and 3.88, respectively). Similarly, we are 95% confident that cluster MNEs are more likely to exchange R&D with other partners than non-cluster MNEs (means 4.31 and 3.63, respectively). The other types of linkages transferred by MNEs in cluster industries have slightly higher means but they are not statistically different.

Quantity is measured by confidence intervals calculated from proportions but we find no differences between the quantity of different resources shared by cluster and non-cluster MNEs and therefore the table is only in Appendix D (p.128).

Table 4.7. Relationship between MNEs' cluster membership and linkage quality: One-way ANOVA

Suppliers	R&D		Management		Marketing		HR	
	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.
Cluster	4.23	1.45	3.20	1.49	3.36	1.46	3.52	1.52
Non-cluster	3.98	1.57	2.84	1.43	3.62	1.64	3.40	1.46
F	0.74		1.65		0.78		0.17	
Significance	0.393		0.201		0.381		0.683	
Buyers	R&D		Management		Marketing		HR	
	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.
Cluster	4.73	1.39	2.82	1.30	3.95	1.49	3.11	1.44
Non-cluster	3.88	1.73	2.68	1.40	3.85	1.73	2.90	1.31
F	8.15		0.27		0.10		0.67	
Significance	0.005**		0.605		0.748		0.414	
Other partners	R&D		Management		Marketing		HR	
	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.
Cluster	4.31	1.32	2.86	1.29	3.33	1.32	3.10	1.34
Non-cluster	3.63	1.54	2.77	1.36	3.44	1.59	2.95	1.36
F	5.69		0.12		0.16		0.30	
Significance	0.019*		0.730		0.694		0.584	

Significance shown by ^=0.1 *=0.05, **=0.01, ***=0.001 level

Note: Resource transfer is measured on a Likert-scale ranging from 1 (no transfer) to 7 (very much resource transfer).

Full sample consists of 2x34=68 (resources contributed and received by MNEs) cluster MNEs and 2x25=50 non-cluster MNEs.

Sample sizes for individual ANOVAs vary slightly due to missing observations or lack of resource sharing.

Table 4.8 shows that we are 90% confident that, on average, cluster MNEs share more marketing with their buyers (confidence interval for the proportion of 3.653 – 4.247) than with their suppliers (3.069 – 3.651) or other partners (3.067 – 3.593). We find no such differences among non-cluster MNEs' marketing sharing activities, or among other resources. However, the intervals for the means of marketing resources shared with buyers by cluster and non-cluster MNEs are overlapping, and thus we must conclude that neither of them shares marketing significantly more with buyers than the other one.

The results indicate that, we find no significant difference between cluster and non-cluster linkages in terms of quantity and types. In terms of quality, R&D shared with buyers and other partners is more likely to occur by cluster MNEs than non-cluster MNEs. Therefore, we find partial support for H4.

Table 4.8. Relationship between MNEs' cluster membership and linkage type: Confidence intervals

Resource	Independent variable	Resource	mean	std dev	n	90% low	90% high	Significance within Cluster / Non-cluster	95% low	95% high	Significance	99% low	99% high	Sign.	99.9% low	99.9% high	Sign.
R&D	Cluster	Suppliers	4.23	1.45	68	3.941	4.519		3.885	4.575		3.777	4.683		3.651	4.809	
		Buyers	4.73	1.39	68	4.453	5.007		4.400	5.060		4.296	5.164		4.175	5.285	
		Other partners	4.31	1.32	68	4.047	4.573		3.996	4.624		3.898	4.722		3.783	4.837	
	Non-Cluster	Suppliers	3.98	1.57	50	3.615	4.345		3.545	4.415		3.408	4.552		3.249	4.711	
		Buyers	3.88	1.73	50	3.478	4.282		3.400	4.360		3.250	4.510		3.075	4.685	
		Other partners	3.63	1.54	50	3.272	3.988		3.203	4.057		3.069	4.191		2.913	4.347	
Management	Cluster	Suppliers	3.20	1.49	68	2.903	3.497		2.846	3.554		2.735	3.665		2.605	3.795	
		Buyers	2.82	1.30	68	2.561	3.079		2.511	3.129		2.414	3.226		2.301	3.339	
		Other partners	2.86	1.29	68	2.603	3.117		2.553	3.167		2.457	3.263		2.345	3.375	
	Non-Cluster	Suppliers	2.84	1.43	50	2.507	3.173		2.444	3.236		2.319	3.361		2.175	3.505	
		Buyers	2.68	1.40	50	2.354	3.006		2.292	3.068		2.170	3.190		2.029	3.331	
		Other partners	2.95	1.36	50	2.634	3.266		2.573	3.327		2.455	3.445		2.317	3.583	
Marketing	Cluster	Suppliers	3.36	1.46	68	3.069	3.651	< Buyers	3.013	3.707		2.904	3.816		2.777	3.943	
		Buyers	3.95	1.49	68	3.653	4.247	> Suppliers, Other partners	3.596	4.304		3.485	4.415		3.355	4.545	
		Other partners	3.33	1.32	68	3.067	3.593	< Buyers	3.016	3.644		2.918	3.742		2.803	3.857	
	Non-Cluster	Suppliers	3.62	1.64	50	3.239	4.001		3.165	4.075		3.023	4.217		2.857	4.383	
		Buyers	3.85	1.73	50	3.448	4.252		3.370	4.330		3.220	4.480		3.045	4.655	
		Other partners	3.44	1.59	50	3.070	3.810		2.999	3.881		2.861	4.019		2.700	4.180	
HR	Cluster	Suppliers	3.52	1.52	68	3.217	3.823		3.159	3.881		3.045	3.995		2.913	4.127	
		Buyers	3.11	1.44	68	2.823	3.397		2.768	3.452		2.660	3.560		2.535	3.685	
		Other partners	3.10	1.34	68	2.833	3.367		2.782	3.418		2.681	3.519		2.565	3.635	
	Non-Cluster	Suppliers	3.40	1.46	50	3.060	3.740		2.995	3.805		2.868	3.932		2.721	4.079	
		Buyers	2.90	1.31	50	2.595	3.205		2.537	3.263		2.423	3.377		2.290	3.510	
		Other partners	2.95	1.36	50	2.634	3.266		2.573	3.327		2.455	3.445		2.317	3.583	

4.6. Local Companies' Absorptive Capacity

This section examines the inter-company resource exchange by separating it to (1) resources transferred from MNEs to local companies, and (2) resources received by MNEs from local companies. Quality is measured with paired difference t-tests whereas quantity and linkage type are measured with confidence intervals.

The top of Table 4.9 shows resource transfer with local suppliers analyzed with one-way ANOVA. The table shows that we are at least 99% confident that, on average, R&D resources are more received by MNEs from local suppliers (mean 3.73) than transferred from MNEs to suppliers (4.49). We are also 99% confident that management resources are more received by MNEs (mean 3.38) than transferred from MNEs (mean 2.68) and that HR resources are more received by MNEs (mean 3.83) than transferred from MNEs (mean 3.07). We are 99.9% confident that marketing resources are more received by MNEs (mean 3.79) than transferred from MNEs (mean 3.15)

The middle part of Table 4.9 indicates MNEs' resource sharing habits with local buyers. None of the resources is likely to be more transferred from MNEs to local buyers or vice versa.

The bottom of Table 4.9 indicates MNEs' resource sharing habits with other local partners. Management is more likely to be received by MNE (mean 3.02) from other partners than transferred to them (mean 2.61) with 90% significance. Also, HR resources are more likely to be transferred from local partners to MNEs (mean 3.31) than from MNEs to local partners (mean 2.76) with 95% significance level.

Table 4.9. Quality of resources transferred and received by MNEs: Paired t-test

Suppliers	R&D		Management		Marketing		HR	
	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.
Transferred from MNE	3.73	1.41	2.68	1.34	3.15	1.51	3.07	1.30
Received to MNE	4.49	1.51	3.38	1.52	3.79	1.52	3.83	1.57
Difference	0.73	1.64	0.63	1.55	0.58	1.57	0.70	1.61
t Value	3.29		2.96		2.70		3.21	
Pr > t	0.002**		0.005**		0.009***		0.002**	
N	55		52		53		54	
Buyers	R&D		Management		Marketing		HR	
	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.
Transferred from MNE	4.43	1.64	2.73	1.34	3.85	1.56	3.04	1.48
Received to MNE	4.29	1.57	2.79	1.34	3.96	1.63	3.00	1.29
Difference	-0.19	1.99	-0.02	1.27	0.06	1.90	-0.04	1.86
t Value	-0.68		-0.11		0.22		-0.15	
Pr > t	0.497		0.913		0.831		0.882	
N	54		51		54		52	
Other local partners	R&D		Management		Marketing		HR	
	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.	Mean	St. dev.
Transferred from MNE	3.82	1.49	2.61	1.38	3.40	1.38	2.76	1.47
Received to MNE	4.21	1.39	3.02	1.22	3.35	1.41	3.31	1.35
Difference	0.36	1.77	0.37	1.33	-0.08	1.72	0.52	1.73
t Value	1.44		1.93		-0.33		2.13	
Pr > t	0.160		.0598^		0.740		0.039*	
N	50		49		49		50	

Significance shown by ^=0.1 *=0.05, **=0.01, ***=0.001 level

Note: Resource transfer is measured on a Likert-scale ranging from 1 (no transfer) to 7 (very much resource transfer)

Quantity of resources transferred (from MNEs) and received (to MNEs) by MNEs is presented in Table 4.10. The table shows that we are 95% confident that marketing resources are more frequently received than transferred by MNEs to local suppliers. We find no other significant differences between resources transferred and received.

When linkage types are compared, Table 4.11 illustrates that we are 90% confident that when MNEs transfer resources to local companies, they transfer R&D resources more to buyers than suppliers. We are also 90% confident that they transfer marketing resources more to buyers (means between 4.079 and 4.781) than suppliers (means between 3.428 and 4.032). When resources that MNEs receive from local companies are examined, we are 95% confident that HR resources are more received from buyers (means between 3.516 and 4.184) than suppliers (means between 2.827 and 3.473).

When comparing the significance between the two directions of resource transfer, we are 95% confident that the mean of R&D resources transferred from MNEs to suppliers falls between 3.370 and 4.090 and the mean of R&D resources received from suppliers between 4.105 and 4.875. This indicates that the means are not overlapping and therefore MNEs are more likely to receive R&D resources from suppliers than transfer R&D resources to their suppliers. Similarly, we are 90% confident that the mean of management resources that MNEs transfer to suppliers is between 2.393 and 2.967 while the mean of management received from suppliers is between 3.055 and 3.705 and thus, MNEs are more likely to receive management resources from suppliers than transfer them to suppliers. We are 95% confident that the mean of HR resource transferred to suppliers has a mean between 2.738 and 3.402, and the mean of HR resources received from suppliers is between 3.429 and 4.231. This indicates that MNEs are more likely to receive HR resources from suppliers than transfer them to suppliers.

The overall results strongly suggest that in terms of quality, quantity and type, resources are more likely received by MNEs than transferred from them and therefore we find no support for H5. This finding is further discussed in the fifth chapter.

Table 4.10. Quantity of resources transferred and received by MNEs: Confidence intervals

Linkage with	Resource	Resource direction	p	n	90% low	90% high	Significance	95% low	95% high	Significance	99% low	99% high	Significance	99.9% low	99.9% high	Significance
Suppliers	R&D	Transferred	0.864	59	0.791	0.937		0.777	0.951		0.749	0.979		0.717	1.011	
		Received	0.915	59	0.855	0.975		0.844	0.986		0.821	1.009		0.796	1.034	
	Management	Transferred	0.678	59	0.578	0.778		0.559	0.797		0.521	0.835		0.478	0.878	
		Received	0.831	59	0.751	0.911		0.735	0.927		0.705	0.957		0.670	0.992	
	Marketing	Transferred	0.729	59	0.634	0.824	< Received	0.616	0.842	< Received	0.580	0.878		0.539	0.919	
		Received	0.915	59	0.855	0.975	> Transferred	0.844	0.986	> Transferred	0.821	1.009		0.796	1.034	
	HR	Transferred	0.746	59	0.653	0.839		0.635	0.857		0.600	0.892		0.560	0.932	
		Received	0.881	59	0.812	0.950		0.798	0.964		0.772	0.990		0.742	1.020	
Buyers	R&D	Transferred	0.864	59	0.791	0.937		0.777	0.951		0.749	0.979		0.717	1.011	
		Received	0.898	59	0.833	0.963		0.821	0.975		0.797	0.999		0.768	1.028	
	Management	Transferred	0.644	59	0.541	0.747		0.522	0.766		0.483	0.805		0.439	0.849	
		Received	0.746	59	0.653	0.839		0.635	0.857		0.600	0.892		0.560	0.932	
	Marketing	Transferred	0.814	59	0.731	0.897		0.715	0.913		0.684	0.944		0.647	0.981	
		Received	0.864	59	0.791	0.937		0.777	0.951		0.749	0.979		0.717	1.011	
	HR	Transferred	0.729	59	0.634	0.824		0.616	0.842		0.580	0.878		0.539	0.919	
		Received	0.831	59	0.751	0.911		0.735	0.927		0.705	0.957		0.670	0.992	
Other partners	R&D	Transferred	0.797	59	0.711	0.883		0.694	0.900		0.662	0.932		0.625	0.969	
		Received	0.831	59	0.751	0.911		0.735	0.927		0.705	0.957		0.670	0.992	
	Management	Transferred	0.610	59	0.506	0.714		0.486	0.734		0.446	0.774		0.401	0.819	
		Received	0.763	59	0.672	0.854		0.654	0.872		0.620	0.906		0.581	0.945	
	Marketing	Transferred	0.747	59	0.654	0.840		0.636	0.858		0.601	0.893		0.561	0.933	
		Received	0.780	59	0.691	0.869		0.674	0.886		0.641	0.919		0.603	0.957	
	HR	Transferred	0.661	59	0.560	0.762		0.540	0.782		0.502	0.820		0.458	0.864	
		Received	0.797	59	0.711	0.883		0.694	0.900		0.662	0.932		0.625	0.969	

Table 4.11. Types of linkages transferred and received by MNEs: Confidence intervals

Resources	Resource direction	Linkages with	mean	std dev	n	90% low	90% high	Significance	95% low	95% high	Significance	99% low	99% high	Sign.	99.9% low	99.9% high	Sign.
R&D	Transferred	Suppliers	3.73	1.41	59	3.428	4.032	< Buyers	3.370	4.090	*	3.257	4.203		3.126	4.334	
		Buyers	4.43	1.64	59	4.079	4.781	> Suppliers	4.012	4.848		3.880	4.980		3.727	5.133	
		Other partners	3.82	1.49	59	3.501	4.139		3.440	4.200		3.320	4.320		3.182	4.458	
	Received	Suppliers	4.49	1.51	59	4.167	4.813		4.105	4.875	*	3.984	4.996		3.843	5.137	
		Buyers	4.29	1.57	59	3.954	4.626		3.889	4.691		3.764	4.816		3.617	4.963	
		Other partners	4.21	1.39	59	3.912	4.508		3.855	4.565		3.744	4.676		3.615	4.805	
Management	Transferred	Suppliers	2.68	1.34	59	2.393	2.967	**	2.338	3.022		2.231	3.129		2.106	3.254	
		Buyers	2.73	1.34	59	2.443	3.017		2.388	3.072		2.281	3.179		2.156	3.304	
		Other partners	2.61	1.38	59	2.314	2.906		2.258	2.962		2.147	3.073		2.019	3.201	
	Received	Suppliers	3.38	1.52	59	3.055	3.705	**	2.992	3.768		2.870	3.890		2.729	4.031	
		Buyers	2.79	1.34	59	2.503	3.077		2.448	3.132		2.341	3.239		2.216	3.364	
		Other partners	3.02	1.22	59	2.759	3.281		2.709	3.331		2.611	3.429		2.497	3.543	
Marketing	Transferred	Suppliers	3.15	1.51	59	2.827	3.473	< Buyers	2.765	3.535		2.644	3.656		2.503	3.797	
		Buyers	3.85	1.56	59	3.516	4.184	> Suppliers	3.452	4.248		3.327	4.373		3.182	4.518	
		Other partners	3.40	1.38	59	3.104	3.696		3.048	3.752		2.937	3.863		2.809	3.991	
	Received	Suppliers	3.79	1.52	59	3.465	4.115		3.402	4.178		3.280	4.300		3.139	4.441	
		Buyers	3.96	1.63	59	3.611	4.309		3.544	4.376		3.413	4.507		3.262	4.658	
		Other partners	3.35	1.41	59	3.048	3.652		2.990	3.710		2.877	3.823		2.746	3.954	
HR	Transferred	Suppliers	3.07	1.30	59	2.792	3.348		2.738	3.402	***	2.634	3.506		2.513	3.627	
		Buyers	3.04	1.48	59	2.723	3.357		2.662	3.418		2.544	3.536		2.406	3.674	
		Other partners	2.76	1.47	59	2.445	3.075		2.385	3.135		2.267	3.253		2.130	3.390	
	Received	Suppliers	3.83	1.57	59	3.494	4.166	> Buyers	3.429	4.231	> Buyers***	3.304	4.356		3.157	4.503	
		Buyers	3.00	1.29	59	2.724	3.276	< Suppliers	2.671	3.329	< Suppliers	2.567	3.433		2.447	3.553	
		Other partners	3.31	1.35	59	3.021	3.599		2.966	3.654		2.857	3.763		2.732	3.888	

* We are 95% confident that MNEs are more likely to receive R&D resources from suppliers than transfer R&D to suppliers

** We are 90% confident that MNEs are more likely to receive management resources from suppliers than transfer management to suppliers

*** We are 95% confident that MNEs are more likely to receive HR resources from suppliers than transfer HR to suppliers

5. Discussion and Conclusions

5.1. Introduction

The purpose of this research is to examine inter-company linkages between MNEs (domestic MNEs and foreign affiliates) and locally based companies in Finland. More specifically, resources shared via these linkages as well as their relationship with firm-level determinants are the focus in order to gain an understanding of resource sharing behavior in Finland. Ultimately, inter-company resource sharing is a founding element for radical innovations which are important for Finnish companies' competitiveness in the future (Sabel and Saxenian 2008). Understanding inter-company linkages is essential when examining whether the linkages are strong enough to support radical innovation creation in Finland.

The overall results of the GlobeConnect research discussed in the previous chapter show that especially R&D resources are rather intensively shared between MNEs and locally based companies in Finland. The results show that MNEs share R&D resources principally with their buyers in Finland. This indicates that they listen to their customers' needs and create innovations jointly with them and thus ensure that the outcome has an existing demand. Local companies, including SMEs, in Finland should follow this MNEs' practice and emphasize on creating innovations that have a strong customer demand. When analyzing the resources received and transferred by MNEs, we find that similar types of resources are transferred to both directions: R&D is the most likely transferred followed by marketing, HR and management.

One of the main findings of this thesis is that the respondent MNEs are more likely to share R&D and marketing resources with buyers while management and HR resources are more likely shared with suppliers. Previous literature often examines inter-company linkages without distinguishing the types of resources transferred (exceptions include

Chen et al. 2004, Ivarsson and Alvstam 2005, Palmgren et al. 2000). This thesis contributes to the existing literature by demonstrating that different resources that are shared via linkages should be identified and examined by each resource type (here R&D, management, marketing and HR) in order to understand their role in large value chains. This finding is a significant contribution to the linkage literature. In addition, previous literature often examines linkages with a limited scope (as discussed by Giroud and Scott-Kennel 2006) but this thesis illustrates that they should be analyzed with a broad scope because there are differences between the intensities of linkages with suppliers, buyers and other partners.

Contrary to what was expected, MNEs' ownership has relatively little effect to the linkages in terms of quality, quantity and type. We find that Finnish MNEs are more likely to share R&D resources with suppliers than foreign MNEs. These findings confirm the arguments that MNEs tend to keep their most important activities, especially R&D and innovation, close to their headquarters (Dachs et al. 2007, Castellani and Zanfei 2007). However, the literature suggested that resources in general are more exchanged by domestic (here Finnish) MNEs because they have existing connections and linkages that they can utilize for creating new relationships (Chen et al. 2004, Javorcik and Spatareanu 2008). The results show that, other than R&D resources, foreign MNEs are willing to create linkages and share resources with locally-based companies in Finland.

Cluster membership has also relatively little effect to the linkages in terms of quality, quantity and type. We find that MNEs, which operate in the four main cluster industries in Finland, are more likely to share R&D resources with buyers and other partners than non-cluster MNEs. This is coherent with literature discussed in chapter two that companies in highly competitive industries, that is clusters, are more likely to engage in technology sharing agreements with domestic companies (Ivarsson 2002, Dunning and Cantwell 1987). However, we find that cluster MNEs do not transfer resources other than R&D more significantly than non-cluster industries. This is unexpected because

even though literature emphasized the importance of R&D, the Finnish cluster operate in traditional forest and metal industries, which possess a vast amount of knowledge and resources in other fields than R&D, such as management and training.

We find some alarming indicators that restrict optimal resource sharing via inter-company linkages: MNEs are likely to receive more resources from their local suppliers and other partners than what MNEs transfer to them while the balance should be rather equal. Finnish companies have strong in-house R&D and innovation creation (Sabel and Saxenian 2008) but we find signs that locally-based companies are not able to retrieve enough resources from MNEs. Finnish companies were the best in firm-level technology absorption worldwide in 2001 but they have failed to keep that competitive advantage. Similarly, Finland was the most competitive country worldwide in 2001 and 2003 but it has sunk to sixth place in the end of the decade (World Economic Forum 2001, 2009). Radical innovations will be the most important aspect of competition in the future (Sabel and Saxenian 2008) and without them Finnish companies, and thus Finland, will lose its competitiveness. Sabel and Saxenian (2008) also dispute that Finnish companies continue to focus on optimizing the processes and technologies that they have built their success upon so far and fail to have proper inter-firm cooperation. Finnish companies should enforce more joint R&D projects with local and foreign MNEs as well as other companies in order to develop their staff, build radical innovations and become even more competitive. However, these locally-based companies discussed here include also other MNEs so the results have to be evaluated critically. On the other hand, the data measures MNE executives' opinions of the linkages and it can be expected that they overvalue the resources that their own company transfers to local companies. Therefore, the difference between resources received and transferred by MNEs might be even more significant than what we find here.

This chapter further discusses our findings within the context of literature that was introduced in chapter two. Then, the implications for theory as well as policy and practice are discussed. The suggestions for further research will conclude this thesis.

5.2. Discussion of the Results

5.2.1. Which Resources Are Most Likely Shared via Inter-company Linkages?

Our results reveal that in terms of quality and quantity, R&D (technical know-how, R&D and innovation) resources are most likely received and transferred by MNEs in Finland. Table 5.1 summarizes the resources received by MNEs as well as the resources transferred from MNEs to locally-based suppliers, buyers and other partners. In terms of quality, we find that, on average, MNEs are more likely to receive R&D than any other resources from their suppliers. We also find that, on average, MNEs are more likely to receive R&D and marketing resources than management or HR resources from their buyers, and more R&D than any other resources from their other partners. we did not find significant differences in quantity. The results show that there are differences as measured by quality but not quantity when different resources are analyzed. Therefore, it is interpreted that the proportion of MNEs receiving at least some resources from local companies does not differ as the quality of linkages changes. Put another way, all resources are equally widely received by MNEs but linkages that include R&D are more extensive than linkages involving the transfer of other resources. In line with expectations, MNEs are the most likely to receive R&D resources, but only in terms of quality. Therefore the hypothesis H1a is partly supported.

The results above show that the resources received by MNEs are most likely to be R&D, then marketing, HR, and management. The results concur with the literature discussed in the second chapter that MNEs create linkages with locally based

companies in Finland in order to attain strategic and knowledge resources (Pajarinen and Ylä-Anttila 1999) that are not as easily available in their home markets (Narula and Zanfei 2005). Finland is strong in innovations and R&D (Sölvell and Porter 2002, Steinbock 2006) and extensive R&D investments in Finland have created numerous technology-intensive firms that are attracting foreign companies to locate in Finland in order to integrate the know-how of the Finnish companies into their own operations (Pajarinen and Ylä-Anttila 1999).

In practice, R&D resources that MNEs receive from their local suppliers might be components and parts supplied by local company (Chen et al. 2004) or product specific technology developed by local suppliers. R&D resources received from buyers might be related to product design obtained from local companies (*ibid*), such as agents or industrial customers who are next in the value chain. R&D received from other partners, on the other hand, might be joint cooperation projects that aim to develop new innovations with local companies.

When resource transfer from MNEs to local companies is analyzed, we find that, on average, MNEs are likely to transfer more R&D than management to their suppliers in terms of quality. We also find that MNEs are likely to transfer more R&D than management or HR resources to their buyers and other partners. In terms of quantity, we find that, on average, higher share of MNEs are likely to transfer at least some R&D than management resources to their suppliers as well as to their buyers.

Table 5.1. Summary of the types of resources received and transferred by MNEs in terms of quality and quantity (H1a and H1b)

Linkages with	Resources received by MNEs (H1a)		Resources transferred from MNEs (H1b)	
	Quality	Quantity	Quality	Quantity
Suppliers	R&D > All others ^		R&D > Mgmt **	R&D > Mgmt ^
Buyers	R&D > Mgmt, HR * Mktg > Mgmt, HR *		R&D > Mgmt, HR ***	R&D > Mgmt *
Other partners	R&D > All others *		R&D > Mgmt, HR **	

Significance shown by ^=0.1 *=0.05. **=0.01. ***=0.001 level

The results above are similar in terms of quantity and quality, and therefore we summarize that MNEs are more likely to transfer R&D resources than management resources. Recent literature argues that MNEs are a driving force for R&D activities (Dachs et al. 2007) but we do not find R&D resources being transferred more likely than marketing resources. Therefore, we find only partial support for hypothesis H1b.

R&D related resources are crucial for companies' success, and their significant exchange between MNEs and local companies indicates that they have a mutual trust with each other. In addition, it can be concluded that the types of resources received and transferred by the respondent MNEs are similar. Therefore, when solely linkage intensities are analyzed, the two different linkage directions can be examined jointly by focusing on resource sharing, not in differences between resources received and transferred by MNEs.

In practice, R&D resources that MNEs transfer to their local suppliers might be technology specifications and instructions given to the local company. R&D resources

transferred to buyers might be related to further processing of the product and according to Dunning and Lundan (2008) occur especially with industrial buyers of technologically complicated products. R&D transferred to other partners, on the other hand, are likely to be joint cooperation projects with local partners to develop new innovations.

5.2.2. Do MNEs' Linkages Occur Primarily with Suppliers, Customers or Other Business Partners?

This research finds that the primary direction of resource transfer, thus linkage type, depends on the type of resources shared. Table 5.2 summarizes the results of the analyses that examine the primary linkages type for different resources. Our main finding is that respondent MNEs are more likely to share management resources with suppliers than with buyers while HR resources are more likely to be shared with suppliers than buyers or other local partners. Contrary, on average, MNEs' are more likely to share R&D resources with buyers than other partners, and marketing resources with buyers than suppliers or other local partners.

Table 5.2. Summary of the linkage types with local businesses in Finland (H2)

Resource	Linkages with (H2)
R&D	Buyers > Other local partners *
Management	Suppliers > Buyers *
Marketing	Buyers > Suppliers ** Buyers > Other local partners ***
HR	Suppliers > Buyers ** Suppliers > Other local partners *

Significance shown by ^=0.1 *=0.05. **=0.01. ***=0.001 level

Multiple researchers have paid less attention to forward than backward linkages and found evidence that backward linkages are stronger (Javorick and Spatareanu 2008, Blyde et al. 2004, Smarzynska 2002) whereas the Sfinno project, on the other hand, strongly suggests that forward linkages are stronger than backward linkages in Finland (Palmgren et al. 2000). Previous literature, however, does not typically distinguish different types of resources within linkages. Our results strongly suggest that the nature of linkages with suppliers, buyers or other local partners vary significantly depending on the types of resources shared. Therefore the second hypothesis (H2), which stated that resource sharing is more likely to occur with buyers than supplier and other business partners, is only partly supported.

We find that R&D resources are more likely exchanged with buyers than other local partners but do not find that they are more likely to be exchanged with buyers than suppliers. This indicates that strategically important resources such as R&D are rather shared within the value chain than across value chains. Palmberg et al. 2000 suggest that customers are most important partners in developing innovations and their demand along with observation of market niche are important factors when creating innovations. Especially in a developed country like Finland, companies are technologically capable of developing innovative solutions but they have to meet their customers' demand in order to be successful. When buyers participate in developing new innovations, it results in more customer oriented solutions that have a higher demand. In practice, buyers are more likely long-term business-to-business industrial customers that are jointly developing more tailor made products with the MNE. These could be, for example, tailored equipment for industrial units that are developed in close cooperation with the customers. Contrarily, in less technologically advanced countries, suppliers are perhaps likely to receive significantly more attention from MNEs than buyers because creating cost effective production concepts is more advantageous than creating new innovations there.

The reason that marketing resources are more likely exchanged with buyers than suppliers or other partners indicates that MNEs cooperate strongly with their local buyers and agents in exchanging market know-how and marketing information. This is not unexpected, because local companies are likely to know the local markets or specific market niche better than MNEs do, especially foreign MNEs. MNEs, on the other hand, might have more resources in conducting a marketing plan and marketing campaigns. Since MNEs exchange marketing resources with local buyers, we can assume that they are producing products and services to be sold in the Finnish markets not for exporting purposes. In addition, MNEs are likely to observe local customers' desires and needs to ensure that their products have an immediate demand.

The results indicate that even though literature often has a narrow scope and it does not differentiate different types of resources shared through linkages, there is a need for both. This provides support for the inclusion of forward linkages in future research, despite less emphasis to-date as well as distinguishing the types of resources transferred via these linkages.

Our findings that MNEs are more likely to exchange management resources with their suppliers than buyers indicates that they may have management contracts or technology licensing with their subcontractors. Also HR resources are more likely to be exchanged with local suppliers than buyers or other partners, which indicates that there are perhaps labor exchanges between the MNEs and their suppliers or that there are other joint employee training efforts.

Our results show consistently that linkages with local partners are less likely to occur than linkages with buyers or suppliers. As was discussed in section two, these linkages are often joint projects with competitors or other strategic alliances and they might be less trusting to each other and have weaker cooperation (Rindfleisch 2000). Since they do not include traditional market transactions, they often require more management guidance and investments than supply chain linkages with buyers and suppliers.

Therefore, it is expected that they do not occur as often as linkages along the supply chain. Some researchers, however, argue that collaborative linkages might result in larger innovations (Sabel and Saxenian 2008) and that they are becoming to substitute the supply chain linkages (Hakonen et al. 2009). Therefore they need to be included in the scope of future research on linkages as well.

5.2.3. Are Finnish MNEs More Likely to Share Resources than Foreign Owned MNEs in Terms of Quality, Quantity and Type?

Our findings in Table 5.3 demonstrate that ownership has limited effect on resource sharing intensities between the respondent MNEs and local companies in Finland. In terms of quality, we find that on average, domestic MNEs share more R&D resources with their suppliers than foreign MNEs do but we find no significant differences among management, marketing or HR. This implies that domestic MNEs collaborate more likely with suppliers in terms of R&D than foreign MNEs, and thus, domestic MNEs put more emphasis on product and service development issues in Finland. We find no significant differences between the resources shared by domestic and foreign MNEs in terms of quantity.

Table 5.3. The effect of MNEs' ownership to resource transfer intensity in terms of quality, quantity and type (H3)

Resource	Linkages with	Quality (One-way ANOVA)	Quantity (Confidence intervals)	Linkage type (Confidence intervals)	
				Domestic	Foreign
R&D	Suppliers Buyers Other partners	Domestic > Foreign *			
Management	Suppliers Buyers Other partners				
Marketing	Suppliers Buyers Other partners			Buyers > Other partners *	
HR	Suppliers Buyers Other partners			Suppliers > Buyers ^	Suppliers > Other partners ^

Significance shown by ^=0.1 *=0.05. **=0.01. ***=0.001 level

With regards to linkage types, we find no significant differences that domestic or foreign MNEs' would share R&D or management resources more with their suppliers, buyers or other partners. Marketing resources, on the other hand, are more likely to be shared by Finnish MNEs with buyers than other partners. This indicates that domestic MNEs are more likely to cooperate with local buyers in terms of marketing related activities, such as market information, than with their other partners. We do not find a similar relationship in foreign MNEs' resource sharing behavior. When HR resources are analyzed, we find that domestic MNEs are more likely to share HR with suppliers than buyers, and foreign MNEs are more likely to share with suppliers than other partners.

It is commonly argued that domestic MNEs are more likely to share resources with local counterparts than foreign MNEs (Luukkainen and Pentikäinen 2000, Niininen et al 2000, Castellani and Zanfei 2007) and even the most internationalized MNEs concentrate their core competencies, such as R&D and headquarters, in the home

country (Benito et al 2003, Dachs et al. 2007). Our findings confirm the latter statement but did not find a general difference between domestic and foreign MNEs' resource transfer intensities in terms of quality, quantity and type. Our results show that foreign MNEs are more involved in sharing resource with locally based companies than what was anticipated in the third hypothesis (H3) and therefore it is not strongly supported.

Foreign companies have sometimes been considered a threat for capturing market share from local companies (see Castellani and Zanfei 2006). However, we find no significant differences between domestic and foreign MNEs' resource sharing intensities, other than with R&D resources and thus foreign MNEs are likely to share nearly as much resources with locally based companies in Finland. They offer a vast knowledge base that local companies can access if they are proactive and effectively aim to learn from MNEs. Local companies' ability to take advantage is analyzed later in this chapter.

5.2.4. Are MNEs Operating in the Finnish Cluster Industries more Likely to Share Resources in Terms of Quality, Quantity and Type than those in Non-cluster Industries?

Our results indicate that the significant differences between cluster and non-cluster MNEs' linkage intensities are limited. Quality-wise we find that, on average, MNEs in cluster industries share more R&D resources with buyers and other partners than MNEs in non-cluster industries. We find no significant differences between cluster and non-cluster MNEs' management, marketing and HR resource sharing practices. Literature discussed earlier in this thesis strongly suggests that clusters are centers of excellence where companies are interconnected and create more value than they would be able to create alone (Porter 1980, Simmie and Sennett 1999). However, our results show that only R&D resources shared with buyers and other local business partners are more likely transferred by cluster sector MNEs than non-cluster sector MNEs. We do not find significant differences in terms of quantity between cluster and non-cluster MNEs.

Table 5.4. The effect of MNEs' industry cluster to resource transfer intensity in terms of quality, quantity and type (H4)

Resource	Linkages with	Quality (One-way ANOVA)	Quantity (Confidence intervals)	Linkage type (Confidence intervals)	
				Cluster	Non-cluster
R&D	Suppliers Buyers Other partners	Cluster > Non-cluster ** Cluster > Non-cluster *			
Management	Suppliers Buyers Other partners				
Marketing	Suppliers Buyers Other partners			Buyers > Suppliers, Other partners ^	
HR	Suppliers Buyers Other partners				

Significance shown by ^=0.1 *=0.05. **=0.01. ***=0.001 level

As Table 5.4 shows, that we find that cluster MNEs share more marketing resources with buyers than suppliers or other partners. We do not find significant differences in non-cluster MNEs' sharing of marketing resources. This indicates that cluster MNEs have close ties with their local buyers and they jointly exchange knowledge in regards to marketing know-how and market information. Since there is not a significant difference in most types of resource sharing between cluster and non-cluster sector MNEs, the fourth hypothesis (H4) is only partially supported.

Since the hypothesis is only partially supported but literature strongly argues that clusters increase resource sharing, non-cluster MNEs are potentially accessing the local clusters by creating linkages with them. Clusters form open entities that are formed by local SMEs and connected with domestic and foreign MNEs, which sustain the channels for knowledge transfer locally and globally (Hervás-Oliver and Albors-Garrigós 2008). Put another way, these open entities are likely to create linkages and share resources also with companies outside the clusters. Another reason why our results conflict with literature might be that the cluster industries in this thesis include only the four key clusters in Finland (see Steinbock 2006) while non-cluster group

might include smaller clusters that are intensive and innovative despite their size. In fact, there are so many clusters in Finland that it is likely that most industries are related to clusters of some level. In addition, clusters are often overlapping the industry borders and the member companies' in different industries have relationships that have found to be beneficial (Hakonen et al. 2009). In this thesis, however, these are considered as part of the non-cluster group.

5.2.5. Are Companies Located in Finland Capable of Absorbing the Resources Received from MNEs?

Our results of locally based companies' ability to transfer and receive technology indicate that MNEs receive resources more intensively than what they transfer to local companies. Table 5.5 also shows that MNEs are likely to receive higher quality linkages than what they transfer to local companies. More specifically, we find that, on average, R&D and marketing received from suppliers as well as management and HR received from suppliers and other partners are higher quality than the equivalent resources transferred by MNEs. In terms of quantity, we find that marketing resources are likely to be more frequently received by MNEs from local suppliers than vice versa while we find no differences among other resources.

Table 5.5 illustrates the results and shows that when resources transferred from MNEs to local companies are analyzed, we find that MNEs transfer R&D and marketing more likely to their buyers than their suppliers, that is forward in a supply chain. When linkages received by MNEs are analyzed, we find that MNEs receive HR resources more likely from their suppliers than buyers, thus the resources also flow forward in the supply chain. Since the resources are transferred more likely either from buyers to suppliers, not to other partners indicates that there is a significant flow of resources within a supply chain from the top to bottom.

Table 5.5. The relationships of resource transfer direction to linkage quality, quantity and type (H5)

Resources	Linkages with	Quality (Paired t-test)	Quantity (Confidence intervals)	Linkage type (Confidence intervals)	
				Transferred from MNEs	Received by MNEs
R&D	Suppliers Buyers Other partners	Received > Transferred**		Buyers > Suppliers [^]	
Management	Suppliers Buyers Other partners	Received > Transferred** Received > Transferred [^]			
Marketing	Suppliers Buyers Other partners	Received > Transferred***	Received > Transferred*	Buyers > Suppliers [^]	
HR	Suppliers Buyers Other partners	Received > Transferred** Received > Transferred*			Suppliers > Buyers *

Significance shown by [^]=0.1 * =0.05. ** =0.01. *** =0.001

An interesting piece of information is that MNEs receive significantly more resources from their local suppliers and other partners than what MNEs transfer to them while resources shared with buyers are not more likely to be transferred to either direction. The results are partly contrary to the literature discussed in chapter two, where we discussed that since Finnish companies are technologically highly competent, they have something to teach to MNEs but they are also capable to absorb resources from MNEs and thus the resources transferred and received by MNEs were expected to be equally intensive. Therefore we do not find strong support for the fifth hypothesis (H5).

In order for a knowledge transfer to take place, a MNE should have something to teach and the local firm should have something to learn (Castellani and Zanfei 2003, Blomström and Kokko 2004). One explanation for the less intensive resource transfer from MNEs to local suppliers and other partners than vice versa is that they might be

more developed than MNEs and thus MNEs cannot teach as much to their local suppliers and other partners. This alternative is supported by the argument made earlier in this thesis that Finnish companies, especially in the supplying sectors, have strong R&D capabilities and technical advancement. Also, MNEs are likely to receive and transfer an equal amount of resources with buyers so we can argue that local buyers are not as technologically advanced as MNEs' suppliers or other partners in Finland and therefore buyers have more to learn from MNEs.

However, even if local companies in Finland were experts and more advanced in one area, they should be able to receive an equal amount of resources that are complementing their own technological specialty, otherwise they are taken advantage of by MNEs. There is also a possibility that they are partnering with wrong MNEs that cannot provide resources that local companies can absorb and utilize. MNEs are significant players worldwide in terms of technology creation and control (Maher and Christiansen 2001) and they have a vast amount of resources and knowledge that local companies in Finland should be able to recognize, integrate, and productively use.

Another explanation is that MNEs' local suppliers and other partners in Finland are not able to retrieve all the potential resources available from MNEs. Local companies' competencies and absorptive capacity determine how capable they are to benefit from the linkages (Cantwell 1989, Kokko 1994). Even though Finnish companies are highly competent in terms of technology and R&D, they are not necessarily willing or capable of absorbing new technologies developed by others. As indicated in Table 2.1 in chapter 2, the World Economic Forum ranked firm-level technology absorption the best in the world in Finland in 2001, while it was ninth in 2009. This decline could explain why MNEs transfer fewer resources to their suppliers and other partners than what they receive from them.

As mentioned earlier in this chapter, locally-based companies include also other MNEs and therefore the results regarding the fifth hypothesis need to be evaluated critically.

However, our results indicate that locally-based companies are not capable to absorb as much resources from MNEs as they should. To summarize our findings, it is evident that there are considerable amounts of resources shared via inter-company linkages in Finland. But if locally-based companies are not determined to utilize these linkages and do not consider them as an opportunity for creating radical innovations, the benefits of the linkages are shattered. Inter-company linkages are important building blocks for radical innovations and companies should consider them as a competitive advantage.

5.3. Implications for Theory

This thesis examines the resource transfer between MNEs and their partners located in Finland via inter-company linkages, which is one determinant, in addition of spillovers and competitive issues, for the overall advantages and disadvantages that the presence of MNEs have for the Finnish economy.

Until the early 1980s the literature viewed MNEs as quasi-colonial institutions (Castellani and Zanfei 2006) and they were seen as a threat to individual local companies in host countries. Negative attitude arise when MNEs capture market share on local companies' expense and due to more efficient supply chain they force local companies to lower prices and cut profit margins (Javorcik and Spatareanu 2008). In addition, MNEs' often pay higher wages, which lead to increasing wage demands among local companies, increase their average costs (Görg and Stroble 2004) and cream off the best workforce from the host countries.

Evaluating the effects of the MNEs' inward investment and technology transfer via local company-level panel data studies takes a microeconomic perspective (Görg and Stroble 2001) which enables close investigation of linkages' effects to all key players that are involved in linkages, including MNEs and their suppliers, customers and other

partners. While the weakest MNEs' competitors in host country are suffering from the foreign MNE presence, MNEs' local partners are most likely to benefit from it. Local companies gain value from multinationals through linkages, knowledge transfer and productivity spillovers, which transfer into products, processes and technologies (Jindra et al. 2008). MNEs' local presence promotes their initial contact with local partners in order to develop trust (Dyer and Chu, 2000). It also provides an easy access to the information flow that is important in building new relationships (Chen et al. 2004). This thesis shows evidence that MNEs' share a significant amount of resources with local companies, especially in field of R&D, and thus their presence is likely to have positive effects to local partners through resource sharing activities. That is, MNEs share their immense knowledge base with local companies who should recognize, integrate, and productively use this knowledge to their own benefit.

5.5. Implications for Policy and Practice

Private sector managers should accept that cooperating with suppliers, buyers and other business partners will enhance their company's competitiveness, regardless whether they are MNEs or smaller companies. Our results show that local companies are not absorbing as much knowledge from MNEs as they could. MNEs are more likely to receive resources from their local suppliers, buyers and other business partners than transfer resources to them and this is a considerable problem that private sector managers are faced with. Finnish companies are very capable, and have been successful, in internal R&D but the world is changing and they are not sufficient to build competitiveness upon anymore (Kosonen 2008). Joint development efforts are more likely to create radical innovations and thus increase local companies' competitiveness (*ibid*).

While the intercompany relationships are becoming more intensive, managers should be careful in selecting the correct business partners. Especially joined integration alliance

projects, which were introduced in the second chapter, are typically long term collaborations in which partners' trust to each other become an important element for the partnership's success. In addition, both companies should learn from each other and therefore their existing capabilities should be as advanced but in slightly different fields of expertise. Only in that case the partners are complimenting each other and creating radical innovations. Our results show that R&D resources, which are strategically important, are more likely shared between MNEs and local companies. Managers should be careful with property rights to ensure the other partner cannot take advantage of them.

Because Finland has several strong clusters, it is a good location to facilitate research and development units. The authorities should more aggressively recruit foreign, R&D intensive top-tier companies to locate in Finland. They would open new opportunities also for local companies in Finland to partner with them and create more radical innovations. Local companies should also learn from MNEs' other competencies than R&D. The more diverse the external relationships are, the more likely companies will access to the relevant knowledge (Hurmelinna-Laukkanen and Blomqvist 2007).

The public sector authorities should be aware of the importance of R&D. In order to sustain or increase Finnish companies' and thus, Finland's, competitiveness, they should support joint R&D programs that aim to create radical innovations. This has been rather well understood among the Finnish authorities, and it needs to be continued today even though the economy has sunk and there is not as much funding available as there was before the recession. As was discussed in the second chapter, Finland created a Center of Excellence Program in the early 1990s, during the last recession, to enhance competitiveness by increasing innovations (Sölvell and Porter 2002). R&D was heavily invested both in private and public sectors even though public expenditures were cut in the midst of the recession (Rouvinen and Ylä-Anttila 2003). These actions can be argued to have had a significant difference to the strong R&D and innovative capacity

that Finland has built its competitiveness upon. More specifically, the authorities should emphasize the importance of collaborative inter-company R&D and innovation projects.

An important part of the ensuring the strong R&D and continuous innovations are very skilled employees. The government should ensure that Finnish universities are competitive and they educate enough skilled employees to meet the demand of very competent labor. Finland is facing severe changes in the demographics: a vast amount of workforce is retiring within the next 10 to 15 years and there will be a legitimate demand for skilled labor.

While inter-company cooperation is increasing, intellectual property rights and patents should be strictly enforced in order to avoid problems, such as plagiarism. Based on the World Economic Forum research, the property rights in Finland were ranked the fourth best in the world in 2009. However, the property right issues are changing extremely rapidly and the government should make sure that they are renewed accordingly in Finland in order to secure cooperation among business partners who jointly develop new innovations. Without proper laws and legislations, as well as very skilled labor, Finland will not be an attractive country for resource sharing.

5.6. Suggestions for Further Research

As mentioned during this thesis, linkages and resource transfer in Finland are rather limitedly research and there are several topics that should be further examined. This thesis was an exploratory investigation to discover the nature of the inter-company linkages and certain firm-level determinants' relationships with them. It is essential to understand the linkages before analyzing the cause-effect relationships and other perspectives of the matter.

One of the topics that could be studied in the future is longitudinal study that measures linkage development during time. Young foreign ventures typically have initially weak linkages with local suppliers but over time they increase as they become more familiar with the supplier environment (Görg and Strobe 2004) and more embedded in the host country (Castellani and Zanfei 2006). Since this thesis examined the resource transfer only from MNEs' perspective, future studies should measure also local companies' point of view, e.g. whether partners receive and contribute as much resources as the other counterpart evaluates.

As one of the research questions, this thesis studied how foreign MNEs resource transfer differs from domestic MNEs. However, this thesis did not differentiate Finnish companies that are now part of a foreign company through mergers and acquisitions (M&As). One field of studies would be to analyze the ownership more in depth and examine if companies that used to be Finnish owned but are bought by foreign MNEs share different amount of resources than domestic or originally foreign owned companies.

GlobeConnect research was conducted in four other countries besides Finland, and the results of these should be compared to analyze how the results differ in these. This would be especially valuable because the study was conducted with exactly the same questionnaire and all countries are relatively similar in terms of size and economic development. This would allow seeing whether the resources shared in Finland are indeed, significant compared to the other countries.

In order to better recruit the companies that are beneficial to Finnish economy, the types of MNEs transferring the most resources should be examined. In addition, the types of cooperation should be studied to better understand what types of cooperation companies value the most and how the resource transfer takes place in practice.

This thesis analyzed linkages with a rather broad scope and did not limit it to single types of linkages (e.g. backward linkages with suppliers) or vertical supply chain. However, it measures resources shared solely with Finnish suppliers, buyers and other partners. A further research could be done by including the linkages with foreign partners. This approach would catch the respondent's involvement in the global value chains and networks that reach beyond the Finnish borders.

To conclude, linkages offer a vast amount of research opportunities. The business environment is changing worldwide, and resource sharing partnerships become increasingly common and important for companies' competitiveness. Further research in field of linkages and resource transfer is fundamental in order to better understand how they support radical innovation creation and sustain Finland's competitiveness in the future.

6. References

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7. Appendices

Appendix A. GlobeConnect Questionnaire



Large Firms & Linkages in Small Economies

Contact: Joanna.Scott-Kennel@vuw.ac.nz

Welcome!

Thank you for choosing to answer the **GlobeConnect** questionnaire. It will ask you to provide details on your activities in Finland, relationships with local business partners, international connections and local business environment.

Answers will remain absolutely confidential and only used for research purposes. No individual firm information will be presented in results or disseminated to other firms.

In conjunction with Professor Reijo Luostarinen at the Helsinki School of Economics this project is undertaken by:

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Ministerie van Economische Zaken

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Singapore International Chamber of Commerce



Dr. Hafiz Mirza

Head of Research of Development Issues, UNCTAD



Dr. Henry Yeung

National University of Singapore



I – YOUR FIRM

1. Where is your firm's global headquarters (HQ) located?

(This question and the next relate to your ENTIRE COMPANY worldwide, not just Finland if you are a foreign-owned subsidiary or a Finnish firm with HQ outside of Finland.)

- ☐ In Finland
- ☐ In Europe
- ☐ Elsewhere, please specify:

2. How many employees does your global company have?

(please indicate total number of employees in each place)

In Finland

In Europe

Elsewhere

3. When was your company first established in Finland?

Year

→ If your firm has foreign (non-Finnish) ownership, please answer question 4, otherwise go to question 5.

4. Foreign ownership

4a. What is the share of foreign direct ownership of your firm in Finland? (eg. by foreign parent company(s))

Percentage of foreign direct (controlling) ownership:

4b. How many years has your firm been owned by your current foreign parent company?

Number of years:

4c. Does your firm have regional headquarter responsibilities?

(e.g. coordination of regional activities in manufacturing, service delivery, marketing or distribution)

Yes ☐ No ☐

5. What share of your firm is foreign portfolio investment?

(eg. from foreign institutional, non-controlling shareholders)

Share of portfolio investments:

6. How much autonomy does your firm have over strategic decisions in the following areas?

(please tick as appropriate)

	No autonomy		Some autonomy			Full autonomy		Not applicable
	1	2	3	4	5	6	7	NA
R&D, product (service) design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Production and processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Procurement, choice of suppliers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing, distribution and sales	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

II – GEOGRAPHICAL DISTRIBUTION OF PURCHASES AND SALES

In this section, we are interested in the flow of goods and services between and within your firm, and with other business partners.

7. What percentage of your firm's total INPUTS is purchased by your firm from:

(Inputs include raw materials, intermediate & final goods (including technology) and services)

Finland	Europe	Country of corporate HQ (if not Finland)	Rest of the world	Total Inputs
%	%	%	%	100%

8. What percentage of your firm's total OUTPUT is sold by your firm to:

(Output includes value-added or sales of raw materials, intermediate & final goods (including technology) and services)

Finland	Europe	Country of corporate HQ (if not Finland)	Rest of the world	Total Output
%	%	%	%	100%

9. What share of your firm's total output is sold to other units of your firm internationally? *(please give best estimate)*

% of total outputs sold to other units of your firm %

10. What share of your firm's total inputs is purchased from other units of your firm internationally? *(please give best estimate)*

% of total input purchased from other units of your firm %

III – YOUR FIRM'S ACTIVITIES

11.

Which of the following activities are performed by your firm in Finland?

(please tick if your firm is currently involved in any of these activities and how you expect your involvement to change in the next 5 years)

	Currently involved in	In the next 5 years		
		Decrease	Same	Increase
R&D, product (service) design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Product design and adaptation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Procurement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Manufacturing or service delivery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Human resource management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accounting & finance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information systems & IT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing, sales, after-sales (incl. helpdesk and call centres)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, please specify:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. In the past 5 years, has your firm (partially) outsourced any of these activities?

R&D	<input type="checkbox"/>	Product design and adaptation	<input type="checkbox"/>
Procurement	<input type="checkbox"/>	Manufacturing or service delivery	<input type="checkbox"/>
HRM	<input type="checkbox"/>	Accounting and finance	<input type="checkbox"/>
Information systems, IT	<input type="checkbox"/>	Distribution & logistics	<input type="checkbox"/>
Marketing, sales & after sales	<input type="checkbox"/>	NO OUTSOURCING AT ALL	<input type="checkbox"/>
Other, please specify:	<input type="checkbox"/>		

13. For the 3 most important activities (above) what share has been outsourced?

(please indicate the activity and approx. % outsourced in the past 5 years)		Primarily outsourced from:			
		Finland	EU	China and India	Elsewhere
1 Activity =	%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 Activity =	%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Activity =	%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. In the next 3-5 years, has your firm (partially) outsourced any of these activities?

R&D	<input type="checkbox"/>	Product design and adaptation	<input type="checkbox"/>
Procurement	<input type="checkbox"/>	Manufacturing or service delivery	<input type="checkbox"/>
HRM	<input type="checkbox"/>	Accounting and finance	<input type="checkbox"/>
Information systems, IT	<input type="checkbox"/>	Distribution & logistics	<input type="checkbox"/>
Marketing, sales & after sales	<input type="checkbox"/>	NO OUTSOURCING AT ALL	<input type="checkbox"/>
Other, please specify:	<input type="checkbox"/>		

15. For the 3 most important activities (above) what share does your firm plan to outsource?

(please indicate the activity and approx % to be outsourced in the next 3 to 5 years)		Primarily outsourced from:			
		Finland	EU	China and India	Elsewhere
1 Activity =	%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 Activity =	%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Activity =	%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IV –BUSINESS RELATIONSHIPS

First, please indicate how your firm *benefits* from business relationships.

16. To what extent does your firm benefit from resources received from suppliers in Finland?
please tick appropriate

	Not at all		To some extent			Very much		NA
Technical know-how, R&D and innovation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organisation & management know-how	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing know-how, market information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Training, development of human resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17. To what extent does your firm benefit from resources received from buyers (incl. customers & agents) in Finland?

	Not at all		To some extent			Very much		NA
Technical know-how, R&D and innovation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organisation & management know-how	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing know-how, market information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Training, development of human resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18. To what extent does your firm benefit from resources received from other business partners (incl. alliances and joint-ventures) in Finland?

	Not at all		To some extent			Very much		NA
Technical know-how, R&D and innovation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organisation & management know-how	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing know-how, market information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Training, development of human resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

19. To what extent does your firm benefit from resources received from other business partners (incl. alliances and joint-ventures) worldwide?

	Not at all		To some extent			Very much		NA
Technical know-how, R&D and innovation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organisation & management know-how	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing know-how, market information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Training, development of human resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

20. To what extent does your firm benefit from resources received from other units of your firm located worldwide?

	Not at all		To some extent			Very much		NA
Technical know-how, R&D and innovation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organisation & management know-how	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing know-how, market information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Training, development of human resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Second, please indicate how your firm contributes to the development of its business partners, through regular interaction in the business relationships.

21. To what extent does your firm contribute resources to suppliers in Finland?

(please tick as appropriate)

	Not at all		To some extent			Very much		NA
Technical know-how, R&D and innovation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organisation & management know-how	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing know-how, market information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Training, development of human resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22. To what extent does your firm contribute resources to buyers (incl. customers & agents) in Finland?

	Not at all		To some extent			Very much		NA
Technical know-how, R&D and innovation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organisation & management know-how	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing know-how, market information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Training, development of human resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

23. To what extent does your firm contribute resources to other business partners (incl. alliances and joint-ventures) in Finland?

	Not at all		To some extent			Very much		NA
Technical know-how, R&D and innovation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organisation & management know-how	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing know-how, market information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Training, development of human resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

24. To what extent does your firm contribute resources to other business partners (incl. alliances and joint-ventures) worldwide?

	Not at all		To some extent			Very much		NA
Technical know-how, R&D and innovation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organisation & management know-how	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing know-how, market information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Training, development of human resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

25. To what extent does your firm contribute to resources to other units of your firm located worldwide?

	Not at all		To some extent			Very much		NA
Technical know-how, R&D and innovation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organisation & management know-how	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing know-how, market information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Training, development of human resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

V – BUSINESS ENVIRONMENT IN FINLAND

26. How favourable are the following aspects of Finland for your firm?

(please tick as appropriate)

	Not at all favourable		Somewhat favourable			Very favourable		NA
	1	2	3	4	5	6	7	NA
Access to markets and resources								
Finnish market	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proximity to European Union market	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of natural resources, raw materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to capital	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of skilled labour	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local conditions	1	2	3	4	5	6	7	NA
Knowledge infrastructure (e.g. universities)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical infrastructure (e.g. ports, roads, telecom...)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lifestyle (quality of life)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business relationships	1	2	3	4	5	6	7	NA
Finnish suppliers (including professional services)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proximity to European Union suppliers (including professional services)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Presence of key competitors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local rules and regulations	1	2	3	4	5	6	7	NA
Regulatory compliance costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government assistance/incentives/subsidies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other , please specify:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

27. How will these aspects in Finland change for your firm in the next 3 to 5 years?

(please tick as appropriate)

	Decline	Same	Increase
Finnish market	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proximity to European Union market	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of natural resources, raw materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Access to capital	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of skilled labour	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Knowledge infrastructure (e.g. universities)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical infrastructure (e.g. ports, roads, telecom...)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lifestyle (quality of life)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Finnish suppliers (including professional services)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proximity to European Union suppliers (including professional services)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Presence of key competitors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regulatory compliance costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government assistance/incentives/subsidies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other , please specify:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

VI – YOUR FIRM'S PERFORMANCE

In this section, we wish to understand the basis for your competitive advantages and your assessment of local competitors in Finland.

28. What percentage of sales does your firm spend on:

1- R&D? %

2- Marketing and sales activities? %

29. Relative to your key competitors in Finland how would you assess your firm's performance in the following?

	Much worse			Similar			Much better	
(please tick as appropriate)	1	2	3	4	5	6	7	
Productivity and efficiency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Profitability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Sales growth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

30. To what extent are your firm's competitive advantages derived from the following factors?

	Not at all		To some extent				Very much	NA
(please tick as appropriate)	1	2	3	4	5	6	7	
Price of product or services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of product and service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Innovation and creativity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing, sales, reputation and branding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Productivity and efficiency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Managerial or organisational routines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Procurement and supply	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Location near to infrastructure / critical resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ability to predict and respond to market demand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, please specify:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

VII– Strategy at corporate level

These questions relate to the global strategy and worldwide activities of your ENTIRE COMPANY (and not only the Finnish activities, if appropriate).

31. To what extent do the following statements describe the strategy of your firm at the corporate level? (please tick as appropriate for global operations or foreign HQ if foreign-owned)

	Not at all		To some extent				Very much	NA
Our company ..	1	2	3	4	5	6	7	
...achieves economies of scale by concentrating its activities at a limited number of locations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...defines its competitive position on a global basis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...has operations in different locations that are closely linked and interconnected	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...treats markets in each location separately	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...operates in different locations by competing on a local basis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
...tries to adapt products and practices to tastes and values in different locations worldwide	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Thank you for completing the questionnaire!

Please indicate if you would like to receive a copy of the results including your personalized report, and/or be notified when the research is published.

Then fill out your relevant contact details, below.

- ☐ YES, I want a copy of the executive summary including PERSONALIZED report comparing my answers with others in Finland!
- ☐ YES, please inform me when this research is published.

Your contact details (include these in the reply email or attach a business card if easier)

First name, surname	
Company name, position	
Postal Address	
City	
Telephone	
Email	

If you would like to add any further comments, please do so in the box below

--

PLEASE RETURN THE COMPLETED QUESTIONNAIRE TO:

joanna.scott-kennel@vuw.ac.nz

**Dr Joanna Scott-Kennel, Helsinki School of Economics,
Department of Marketing and Management, PO Box 1210 (Lapuankatu 6) 00101 Helsinki, Finland**

Results will only be used for research purposes and will only be reported in aggregate form, with no individual firms identified (except your firm's details contained in your own benchmarking report). Data will be stored securely (password protected).

Appendix B. Respondent MNEs' Main Activities and Cluster Membership

Company	Cluster industry	Cluster / Non-cluster	NACE Rev 2	Main activity
Company 1	Forest	Cluster	0161	Support activities for crop production
Company 2	Other	Non-cluster	1083	Processing of tea and coffee
Company 3	Other	Non-cluster	4120	Construction of residential and non-residential buildings
Company 4	Other	Non-cluster	5010	Sea and coastal passenger water transport
Company 5	Metal	Cluster	7112	Engineering activities and related technical consultancy
Company 6	Metal	Cluster	7732	Renting and leasing of construction and civil engineering machinery and equipment
Company 7	Other	Non-cluster	4771	Retail sale of clothing in specialised stores
Company 8	Forest	Cluster	1610	Sawmilling and planing of wood
Company 9	Other	Non-cluster	2825	Manufacture of non-domestic cooling and ventilation equipment
Company 10	Other	Non-cluster	5110	Passenger air transport
Company 11	Forest	Cluster	0220	Logging
Company 12	Other	Non-cluster	4711	Retail sale in non-specialised stores with food, beverages or tobacco predominating
Company 13	Metal	Cluster	2892	Manufacture of machinery for mining, quarrying and construction
Company 14	Metal	Cluster	2895	Manufacture of machinery for paper and paperboard production
Company 15	Forest	Cluster	1712	Manufacture of paper and paperboard
Company 16	ICT	Cluster	4651	Wholesale of computers, computer peripheral equipment and software
Company 17	Metal	Cluster	1729	Manufacture of other articles of paper and paperboard
Company 18	Other	Non-cluster	7912	Tour operator activities
Company 19	Other	Non-cluster	2314	Manufacture of glass fibres
Company 20	Other	Non-cluster	3250	Manufacture of medical and dental instruments and supplies
Company 21	Other	Non-cluster	7112	Engineering activities and related technical consultancy
Company 22	Forest	Cluster	1712	Manufacture of paper and paperboard
Company 23	Chemical	Cluster	2013	Manufacture of other inorganic basic chemicals
Company 24	Other	Non-cluster	4511	Sale of cars and light motor vehicles
Company 25	Metal	Cluster	2824	Manufacture of power-driven hand tools
Company 26	Metal	Cluster	2790	Manufacture of other electrical equipment
Company 27	Metal	Cluster	4669	Wholesale of other machinery and equipment
Company 28	Other	Non-cluster	7911	Travel agency activities
Company 29	Other	Non-cluster	1013	Production of meat and poultry meat products

Appendix B. Respondent MNEs' industries (cont.)

Company	Cluster industry	Cluster / Non-cluster	NACE Rev 2	Main activity
Company 30	Metal	Cluster	4672	Wholesale of metals and metal ores
Company 31	ICT	Cluster	4652	Wholesale of electronic and telecommunications equipment and parts
Company 32	Metal	Cluster	2651	Manufacture of instruments and appliances for measuring, testing and navigation
Company 33	Other	Non-cluster	7311	Advertising agencies
Company 34	ICT	Cluster	6201	Computer programming activities
Company 35	Metal	Cluster	2521	Manufacture of central heating radiators and boilers
Company 36	Chemical	Cluster	1920	Manufacture of refined petroleum products
Company 37	Forest	Cluster	1712	Manufacture of paper and paperboard
Company 38	Chemical	Cluster	4671	Wholesale of solid, liquid and gaseous fuels and related products
Company 39	Other	Non-cluster	4211	Construction of roads and motorways
Company 40	Other	Non-cluster	4673	Wholesale of wood, construction materials and sanitary equipment
Company 41	Forest	Cluster	2200	Logging
Company 42	Other	Non-cluster	1013	Production of meat and poultry meat products
Company 43	Chemical	Cluster	2521	Manufacture of central heating radiators and boilers
Company 44	Forest	Cluster	1712	Manufacture of paper and paperboard
Company 45	Other	Non-cluster	1413	Manufacture of other outerwear
Company 46	Metal	Cluster	2892	Manufacture of machinery for mining, quarrying and construction
Company 47	Other	Non-cluster	6499	Other financial service activities, except insurance and pension funding n.e.c.
Company 48	Other	Non-cluster	1083	Processing of tea and coffee
Company 49	Other	Non-cluster	2910	Manufacture of motor vehicles
Company 50	Metal	Cluster	2822	Manufacture of lifting and handling equipment
Company 51	Metal	Cluster	2620	Manufacture of computers and peripheral equipment
Company 52	Other	Non-cluster	2391	Production of abrasive products
Company 53	Other	Non-cluster	1071	Manufacture of bread; manufacture of fresh pastry goods and cakes
Company 54	ICT	Cluster	6120	Wireless telecommunications activities
Company 55	Other	Non-cluster	2363	Manufacture of ready-mixed concrete
Company 56	Metal	Cluster	2811	Manufacture of engines and turbines, except aircraft, vehicle and cycle engines
Company 57	Metal	Cluster	2895	Manufacture of machinery for paper and paperboard production
Company 58	ICT	Cluster	6201	Computer programming activities
Company 59	ICT	Cluster	2611	Manufacture of electronic components

Appendix C. Relationship between MNE ownership and linkage quantity: Confidence intervals

Linkage with	Resource	Independent variable	p	n	90% low	90% high	Significance	95% low	95% high	Significance	99% low	99% high	Significance	99.9% low	99.9% high	Significance
Suppliers	R&D	Domestic	0.805	82	0.733	0.877		0.719	0.891		0.692	0.918		0.661	0.949	
		Foreign	0.806	36	0.698	0.914		0.677	0.935		0.636	0.976		0.589	1.023	
	Management	Domestic	0.610	82	0.521	0.699		0.504	0.716		0.471	0.749		0.433	0.787	
		Foreign	0.556	36	0.420	0.692		0.394	0.718		0.343	0.769		0.284	0.828	
	Marketing	Domestic	0.683	82	0.598	0.768		0.582	0.784		0.551	0.815		0.514	0.852	
		Foreign	0.694	36	0.568	0.820		0.543	0.845		0.496	0.892		0.441	0.947	
	HR	Domestic	0.695	82	0.611	0.779		0.595	0.795		0.564	0.826		0.528	0.862	
		Foreign	0.833	36	0.731	0.935		0.711	0.955		0.673	0.993		0.628	1.038	
Buyers	R&D	Domestic	0.793	82	0.719	0.867		0.705	0.881		0.678	0.908		0.646	0.940	
		Foreign	0.861	36	0.766	0.956		0.748	0.974		0.712	1.010		0.671	1.051	
	Management	Domestic	0.512	82	0.421	0.603		0.404	0.620		0.370	0.654		0.330	0.694	
		Foreign	0.556	36	0.420	0.692		0.394	0.718		0.343	0.769		0.284	0.828	
	Marketing	Domestic	0.720	82	0.638	0.802		0.623	0.817		0.592	0.848		0.557	0.883	
		Foreign	0.806	36	0.698	0.914		0.677	0.935		0.636	0.976		0.589	1.023	
	HR	Domestic	0.573	82	0.483	0.663		0.466	0.680		0.432	0.714		0.393	0.753	
		Foreign	0.722	36	0.599	0.845		0.576	0.868		0.530	0.914		0.476	0.968	
Other partners	R&D	Domestic	0.780	82	0.705	0.855		0.690	0.870		0.662	0.898		0.629	0.931	
		Foreign	0.667	36	0.538	0.796		0.513	0.821		0.465	0.869		0.409	0.925	
	Management	Domestic	0.524	82	0.433	0.615		0.416	0.632		0.382	0.666		0.343	0.705	
		Foreign	0.472	36	0.335	0.609		0.309	0.635		0.258	0.686		0.198	0.746	
	Marketing	Domestic	0.598	82	0.509	0.687		0.492	0.704		0.459	0.737		0.420	0.776	
		Foreign	0.694	36	0.568	0.820		0.543	0.845		0.496	0.892		0.441	0.947	
	HR	Domestic	0.622	82	0.534	0.710		0.517	0.727		0.484	0.760		0.446	0.798	
		Foreign	0.556	36	0.420	0.692		0.394	0.718		0.343	0.769		0.284	0.828	

Appendix D. Relationship between MNE cluster membership and linkage quantity: Confidence intervals

Linkage with	Resource	Independent variable	p	n	90% low	90% high	Significance	95% low	95% high	Significance	99% low	99% high	Significance	99.9% low	99.9% high	Significance
Suppliers	R&D	Domestic	0.805	82	0.733	0.877		0.719	0.891		0.692	0.918		0.661	0.949	
		Foreign	0.806	36	0.698	0.914		0.677	0.935		0.636	0.976		0.589	1.023	
	Management	Domestic	0.610	82	0.521	0.699		0.504	0.716		0.471	0.749		0.433	0.787	
		Foreign	0.556	36	0.420	0.692		0.394	0.718		0.343	0.769		0.284	0.828	
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	HR	Domestic	0.695	82	0.611	0.779		0.595	0.795		0.564	0.826		0.528	0.862	
		Foreign	0.833	36	0.731	0.935		0.711	0.955		0.673	0.993		0.628	1.038	
Buyers	R&D	Domestic	0.793	82	0.719	0.867		0.705	0.881		0.678	0.908		0.646	0.940	
		Foreign	0.861	36	0.766	0.956		0.748	0.974		0.712	1.010		0.671	1.051	
	Management	Domestic	0.512	82	0.421	0.603		0.404	0.620		0.370	0.654		0.330	0.694	
		Foreign	0.556	36	0.420	0.692		0.394	0.718		0.343	0.769		0.284	0.828	
	Marketing	Domestic	0.720	82	0.638	0.802		0.623	0.817		0.592	0.848		0.557	0.883	
		Foreign	0.806	36	0.698	0.914		0.677	0.935		0.636	0.976		0.589	1.023	
	HR	Domestic	0.573	82	0.483	0.663		0.466	0.680		0.432	0.714		0.393	0.753	
		Foreign	0.722	36	0.599	0.845		0.576	0.868		0.530	0.914		0.476	0.968	
Other partners	R&D	Domestic	0.780	82	0.705	0.855		0.690	0.870		0.662	0.898		0.629	0.931	
		Foreign	0.667	36	0.538	0.796		0.513	0.821		0.465	0.869		0.409	0.925	
	Management	Domestic	0.524	82	0.433	0.615		0.416	0.632		0.382	0.666		0.343	0.705	
		Foreign	0.472	36	0.335	0.609		0.309	0.635		0.258	0.686		0.198	0.746	
	Marketing	Domestic	0.598	82	0.509	0.687		0.492	0.704		0.459	0.737		0.420	0.776	
		Foreign	0.694	36	0.568	0.820		0.543	0.845		0.496	0.892		0.441	0.947	
	HR	Domestic	0.622	82	0.534	0.710		0.517	0.727		0.484	0.760		0.446	0.798	
		Foreign	0.556	36	0.420	0.692		0.394	0.718		0.343	0.769		0.284	0.828	