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INTEGRATED INTERNATIONAL PRODUCTION

A Study of Foreign Transnational Corporations in Sweden

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In memory of
my parents

Abstract

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This doctoral dissertation attempts to contribute to an understanding of the emerging pattern of international specialization among transnational corporations (TNCs), by offering an empirical survey of integrated international production in majority-owned foreign affiliates (MOFAs) located in Sweden in 1993.

The general objective of the study has been to describe the extent of integrated international production, i.e. transactions between MOFAs located in Sweden and their parent- and sister-firms located outside Sweden. A number of research questions were analysed, including the extent in which MOFAs are engaged in: i) exports and host-market production, ii), intra-firm sales, iii) imports of material inputs, iv) intra-firm purchases of material inputs, v) intra-corporate coordination of various parts of the value chain, vi) intra-corporate co-operation in order to develop technological competence and vii) operations with corporate responsibilities i.e. competence centres. Some new trends in foreign direct investments have been identified as being likely to affect the extent of integrated international production, since this was suspected to vary according to: a) the mode of entry of affiliates, b) the absolute size of affiliates, c) the international strategy applied by the affiliates, and d) the Swedish industry clusters in which the affiliates are operating.

The findings suggest that the dominant trend in recent decades of expanding abroad by means of acquisitions, might result in a relative stagnation in terms of integration between different TNC units, since acquired affiliates, generally, tend to be less integrated compared to green-field investments. On the other hand, the tendency towards growth among many affiliates during the years, may lead to increased integration between affiliates and parent firms, since, contrary to what could be expected, larger affiliates seem to be more integrated with other parts of parent corporations, than smaller affiliates. A continuing strategy among TNCs to rationalize their production may also lead to more integration between various parts of the TNC-system, since affiliates involved in cross-border product or process specialisation were found to be among the most integrated. Finally, the recently observed tendency of many TNCs to invest in competitive industry-clusters in various host-countries, does not seem to have resulted in more integration between affiliates operating in competitive industry clusters and the rest of the parent corporations, compared to affiliates operating in other industries.

Moreover, the study provides a reference for comparative studies, both in terms of longitudinal analysis of changes in integrated international production among foreign affiliates located in Sweden through time, as well as inter-country comparisons between affiliates located in different countries. Together, this facilitates comparisons with established TNC theory.

Keywords: Integrated international production, transnational corporations, foreign-owned affiliates, export, import, procurement, intra-firm trade, green-field investments, acquisitions, miniature replicas, rationalized manufacturers, strategic independents, industry-clusters.

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Göteborg, September 1996

Inge Ivarsson

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1 INTRODUCTION

1.1 Background

During the last few decades the economic activities of many countries have increasingly become internationalized and integrated in terms of foreign trade and cross-border investments. Generally speaking, two different types of international economic integration can be identified (UNCTAD-DTCI 1993). Firstly, "shallow integration", which is a result of international movements of capital and international trade in goods and services, produced by independent firms. In this situation, international transactions are mainly organized through international, arm's-length trade, based on a division of labour between independent producers. This integration involves a limited number of relationships, primarily organized through the international market, where independent buyers and sellers respond to market prices. Secondly, "deep integration" extends to the level of production of goods and services, and, in addition, normally increases visible and invisible trade. The main driving forces behind deep integration are the transnational corporations (TNCs), as they integrate production of goods and services, basically through ownership control of foreign located affiliates. In this situation, international transactions are organized between two units under common ownership or common control, including trade in intermediate products, and, normally, involving some form of ongoing business relationship between manufacturing enterprises located in different countries. It, therefore, reflects a degree of international economic integration that generally goes beyond a simple arms-length trading relationship (Levy and Dunning 1993).

In the present study, the importance of transactions between different units of TNCs, i.e. affiliates and parent firms, under a legally common ownership, will be analysed and identified as "integrated international production", in contrast to business transactions between legally independent firms. Integrated international production through the operations of TNCs, substantially deepens integration between countries, as it brings with it a package of relationships at the level of production. Even simpler forms of international production, such as stand-alone operations of foreign affiliates, involve links between parent and affiliates through ownership, management, technology-transfer and the sharing of profits. Integrated international production extends these linkages to most or all functional activities of the firm. The result is a dense network of interrelated relationships between TNCs and their affiliates and among affiliates, involving intra-firm trade in goods and services, as well as other intra-firm resource-flows. The expansion of integrated international production results in stronger linkages between countries and regions through increased flows of goods, services, and other resources, at the same time as these flows increasingly take place within the domain of individual TNCs.

Some indications of the importance of integrated international production can be found in the growth rates in foreign direct investments (FDI), which, during recent

years has substantially overshadowed those of foreign trade and manufactured output on a global scale (UNCTAD-DTCI 1993). Furthermore, in the mid-1990s, it is estimated that some 37 000 TNCs, world-wide, generated about $5.5 trillion worth in total sales, meaning that about one third of the world's private sector productive assets are under the governance of TNCs (UNCTAD-DTCI 1995). Thus, the trend to organize production on an international basis implies that more and more of a country's resources are involved in the building of an integrated production system. International production by means of establishing production facilities abroad is, of course, not exclusively a post World-War Two phenomenon. Investments abroad by European-based enterprises can be traced back at least to the Middle Ages, with Italian bankers operating in England representing the Papacy. Modern European business abroad had its origins in the eighteenth century with, for example, French companies operating coal-mines in Germany as early as the 1770s (Wilkins 1991). What seems new, however, is the tendency for TNCs to functionally integrate their geographically dispersed activities. For example, until the 1970s most companies that had manufacturing operations in several countries ran their manufacturing operations independently as portfolio-investments. However some exemptions to this rule can be found, basically in the major petroleum-producing companies, who, at an early stage, coordinated supply lines from the Middle East to their customers. Another early example of integrated production can be found in the the Ford Motor Company, who supplied it's assembly plants in Europe with some parts from the United States in the beginning of the 20th century (Flaherty 1986).

In the present study, three main indications of integrated international production will be analysed. The first is related to the extent that foreign located affiliates are engaged in export activities. In a historical perspective, commitments by foreign located affiliates of TNCs in export-activities are a relatively new phenomenon, since most of affiliates located abroad have generally been, and probably still are, producing mainly for the local or nearby markets. Basically, exports by foreign located affiliates of TNCs started to grow during the 1970s, witnessing a shift away from traditional import-substituting and resource based FDIs, mainly characterized by free-standing operations of foreign-located affiliates, to those designed to promote an integrated structure of production by TNCs and their affiliates (Dunning 1988b). This type of internationally integrated production can be exemplified by export-platform investments in the newly industrialized countries, and in trade among, and between affiliates and their parent companies within regional integrated areas, e.g the EU.

Indications, mainly based on data from US firms, seem to suggest that, since the mid-1960s, an increasing share of total world exports by TNCs are performed by affiliates located abroad, while exports by the parent corporation at the home base, are stable or declining. By the mid-1980s, almost one half of all exports by US TNCs were estimated as being carried out by foreign located affiliates (UNCTC 1988). Significant increases in affiliates' exports have been identified, especially inside regional markets, e.g. the EU-market, where free movement of goods and services

promotes intra-EU exports, when TNCs specialize their manufacturing operations in order to achieve economies to scale by supplying the EU market through large-scale manufacturing by a decreasing number of affiliates (Cantwell 1994a).

The second indication of internationally integrated production that will be focused on in the present study, is related to the growth and composition of intra-firm trade, i.e. international trade between two or more units under common ownership. Estimates of intra-firm trade suggest that, in the early 1970s, this accounted for some 20 percent of world trade, while by the early 1990s this figure has grown to around one third (UNCTAD-DTCI 1993). Besides the tendency towards an increase in intra-firm trade, changes in relation to the product composition of intra-firm trade can also be seen. Since the 1970s, the relative importance of intra-firm trade in natural resource-based commodities has diminished, at the same time as the importance of intra-firm trade in manufactured products has grown. This seems to be especially true for parts, components and other intermediate products in the medium and high technology industry sectors which have undergone rationalization at the international level (Casson et al. 1986).

However, while intra-firm trade since the 1970s has grown constantly in absolute terms, the relative importance for overall world trade has changed only marginally in the last decade (Levy and Dunning 1993). The main reason why intra-firm trade has not continued to increase in relation to overall trade, despite an increase in integrated production, can be related to the fact that, in many industries, outsourcing of various parts of the firms' value chain has occurred. Through an externalization of what is perceived as pheripherial activities, many firms focus on their core activities, while various intermediate goods and services are increasingly bought from independent suppliers. These externalized activities are primary organized through international sourcing of inputs, which during the last three decades, has grown steadily in most advanced market economies (Wyckoff 1993).

The third indication of integrated international production that will be analysed in the study, is related to the fact that the international strategies of many TNCs, to a growing extent include decisions concerning integration and coordination of different functional activities, or parts of the firms value chain (Porter 1986). These considerations are based upon a firm's ability to shift production or any other part of the value chain to wherever it is found to be most profitable. Of course, not all forms of integration are based upon parent corporations' strategic plans, but may result from an incremental process where individual units of a TNC cooperate in order to achieve scale or synergical effects. In TNCs operating with such a complex integration strategy, any affiliate may perform, either separately, or in cooperation with other affiliates, functions for parts or the whole parent organization. In this situation, a functional integration of activities in various locations is taking place, although not all parts of the value chain can or will be integrated in the same manner. Empirical indications seem to suggest that those functional activities TNCs undertake in an

integrated manner primarily include R&D, procurement, manufacturing, accounting, finance, training, corporate planning and legal activities (UNCTAD-DTCI 1993).

Integrated international production can be motivated for a number of reasons (Levy and Dunning 1993), some of which will be briefly discussed below. First, differentials in factor cost between countries have given rise to offshore production in low-wage countries, especially in the newly industrializing countries in Asia, as well as a growth in international sourcing of parts, components and other materials from low cost suppliers world wide. Secondly, in many situations, a firm engages in international production not because of cost reduction, but rather to gain access to specific technologies and capabilities not available domestically. Mergers and acquisition activities are perceived by many firms as a method of quick access to these complementary resources and capabilities almost anywhere in the world. These resources and capabilities are often found among firms clustered in specialized industries and located in specific regions in developed countries. A third reason why firms engage in international production is the desire to take advantage of economies of scale, either in terms of world-wide markets, based on convergence of tastes and income levels, or, in terms of rationalized production through joint ventures or strategic alliances in order to share risks and costs related to R&D and marketing. A fourth reason motivating firms to engage in international production is related to risk reduction and flexibility, through the strategy of multiple sourcing of components or as a means to cope with fluctuating exchange rates. A fifth important motive for international production relates to responses to national political pressures and incentives forcing or attracting firms to invest in certain countries. Finally, new communication and transportation technologies have facilitated the search for locational advantages to complement those created by the firm and have made it possible to coordinate a larger number of cross-border activities more effectively.

Although the general trend seems to show an increased integration between different units of many TNCs, a number of constraints can also be identified. For example, new production methods based on Japanese-styled, lean production systems, seem to put a premium on relatively short geographical distances, either between suppliers and assemblers using just-in-time delivery techniques, as well as between suppliers and manufacturers involved in long term co-operative relationships. Related to this is the tendency among many TNCs to shift their competitive strategies towards product differentiation based on quality, design and a closer pre- and after sales services. This can be made by building a closer relationship with suppliers, customers and other agents located in sophisticated business infrastructures. Thus, the nature of competitiveness has been transformed from a situation of given advantages and predictable firm behaviour, to a situation where competitiveness is based on continuous innovation and cooperative arrangements among firms based in different countries (Jacquimin 1991). Finally, national differences in consumer tastes, preferences and cultural acceptance of products and services are still prevalent, forcing many firms to operate with a flexibility towards national differences and with restricted integration of firms' operations.

In the present study, some new trends in FDI will be considered as being likely to have an impact on the extent to which the international activities of TNCs are integrated. Four aspects will be of special interest. Firstly, the extent of integration is believed to be affected by the mode of entry into foreign markets. The traditional form of FDI, i.e. the set-up of new businesses through green-field investments in order to capture new or protect existing markets, is, at least in developed countries, increasingly changing towards a strategy of acquisition of competitors, suppliers or other firms, controlling what is perceived to be assets, complementary to those held by the investing firm. As acquired firms normally have their own technological and organisational structure, and at the same time have established business relationships with suppliers and customers, they might be more difficult to integrate, compared to affiliates started by means of green-field investments.

Secondly, the extent of international integration might also be affected by the size of individual affiliates. Partly as result of the increasingly used method of expansion by means of acquisitions of existing companies, partly as a result of the growth of many foreign-located affiliates over the years, many of these are, today, large entities, controlling not only manufacturing operations, but also a host of other activities, including marketing and R&D. As a result, these large affiliates may be able to operate more independently from parent firms, compared to smaller affiliates.

Thirdly, the extent of integrated production is also likely to be affected by the capability and willingness of TNCs, or their affiliates, to implement various international strategies when operating in different markets. Even if industry or country specific factors put a premium on a rationalized strategy with extensive integration of large scale operations, the capability and willingness of individual TNCs to react to these pressures is a most important determinant affecting the degree of integration.

Fourth, as was discussed above, many TNCs invest these days in countries or regions in order to capture specific skills and competencies held by suppliers, customers or other firms located in a specific country or region. These competencies are often generated in close relationship with other firms located in this specific region or nation, meaning that these competencies are largely location-specific and difficult to transfer to other places, even if they are embodied in a majority-owned affiliate. Hence, depending on whether the foreign located affiliate operates in an industry where the host country has generated an international competitiveness based on a cluster of interrelated firms and institutions, this might also affect the extent to which the affiliates are integrated into parent corporations' activities.

1.2 Objectives of the study

The present study is an attempt to contribute to an understanding of the emerging pattern of international specialization among TNCs, by offering an empirical survey of integrated international production in majority-owned foreign affiliates (MOFAs) located in Sweden in 1993. The *first*, general, objective of the study is :

> *to describe the extent of integrated international production, i.e. transactions between MOFAs located in Sweden and their parent- and sister-firms located outside Sweden.*

Three broad aspects of integrated international production are focused upon. First, the extent to which MOFAs are involved in export activities, alternatively produce for the local market in Sweden. Second, the extent that MOFAs are involved in intra-firm sales of manufactured products, respectively, intra-firm purchases of material inputs, and third, the extent in which MOFAs integrate other parts of their value chains with parent- and sister-affiliates outside Sweden. In chapter 4, a specification of this objective will be presented, resulting in seven research questions that will empirically analyse the extent of integrated international production.

Furthermore, in the discussion above, some new trends in FDI have been identified as likely to affect the tendency towards increasing integration between TNC-units. In order to analyse the possible existence of any systematic difference in terms of integrated international production between different types of affiliates, four categories of affiliates will be considered. The degree of integrated international production is suspected to vary according to: a) the mode of entry of affiliates, b) the absolute size of affiliates, c) the international strategy applied by the affiliates, and d) the Swedish industry clusters in which the affiliates are operating. Since most of these four categories of affiliates are analytical concepts, not easy to observe empirically, we must first identify the different categories of affiliates. Therefore, a *second* objective of the study is:

> *to identify variations in: a) the mode of entry of affiliates, b) the absolute size of affiliates, c) the applied international strategy of the affiliates, and, d) the Swedish industry clusters in which the affiliates operate.*

After the different categories of affiliates have been identified, it is possible to analyse any systematic variations between the identified categories in terms of integrated international production. Hence, the third objective of the study is:

> *to analyse the existence of any variations in the extent of integrated international production between affiliates according to a) the mode of entry of affiliates, b) the absolute size of affiliates, c) the applied international strategy of the affiliates, and, d) the Swedish industry clusters in which the affiliates operate.*

1.3 Structure of the study

In an international perspective, in-depth studies of the operations of TNCs and their affiliates are relatively few. This is mainly due to the fact that the necessary data cannot be found in official sources, but is only available through specially designed surveys, where the quality of collected data critically depends on the willingness and ability of company managers to provide the crucial information. In addition, even where company managers are cooperative when supplying researchers with this type of information, a considerable amount of effort is required to collect and organize this type of data. For these reasons, it is believed that a fairly detailed presentation of the empirical findings of the study would be of general interest. Hence, rather than analysing the data, using only statistical methods, thus hiding the basic descriptive findings, a detailed account of affiliates' exports, intra-firm trade and integration of other parts of their value chains will be given as part of the analysis.

Part I is an introduction to the study, consisting of three chapters, including the present. Chapter 2 defines the scope of the study, discusses some related methodological problems and presents the database of firms to be analysed. In chapter 3 a broad, historical, presentation of the size and structure of the foreign-owned manufacturing sector in Sweden is given. This makes it possible to compare the findings of the present study and indications of integrated international production among foreign-owned affiliates located in Sweden during earlier years.

Part II consists of chapter 4, which discusses basic concepts, theories and earlier empirical findings which can be related to a number of aspects of integrated international production that will be analysed in the present study. The extent in which foreign located affiliates are involved in exports of manufactured products and imports of material inputs, including the extent of intra-firm trade is brought into focus. Other topics which are discussed, are the degree to which TNCs tend to coordinate other parts of their geographically dispersed value-chains; to what extent MOFAs are involved in cooperation with parent- and sister-affiliates in order to generate technological competence, and, finally, whether foreign affiliates tend to operate as competence centres on behalf of other parts of the parent corporation. Based on this discussion, the chapter ends with a number of research-questions which will be analysed in the study.

Part III starts the presentation of the empirical findings of integrated international production among the affiliates located in Sweden. Chapter 5 presents a total picture of all surveyed affiliates, starting with findings on the extent in which MOFAs are involved in resale of products on behalf of sister- and parent-firms. Thereafter, an analysis is presented showing the importance of host market production and manufactured exports, continued by some empirical findings on intra-firm sales of manufactured output. After this, a comparison of export-intensity of MOFAs and domestic firms in Sweden, is presented in order to analyse whether the foreign affiliates tend to be more export oriented compared to domestic firms.

Thereafter, the chapter continues with a presentation of findings on the degree in which MOFAs purchase material inputs from suppliers in Sweden, alternatively, import material inputs from suppliers abroad, including indications of backward vertical integration through intra-firm purchases of material inputs. Here an attempt is also made to analyse whether MOFAs import a larger share of inputs, compared to domestic firms.

After this, the chapter turns to an analysis of integration of various parts of MOFAs' value-chain. Three aspects are considered: intra-corporate coordination of different functional activities, inter-firm and intra-corporate cooperation in order to generate technological competence, and indications of MOFAs operating as competence centres on behalf of parent- or sister-affiliates.

Chapter 6 summarizes the most important findings on integrated international production among MOFAs located in Sweden 1993. There, an attempt is also made to put some of these findings into a historical, as well as a contextual perspective, discussing the extent in which integrated international production among foreign manufacturing affiliates in Sweden has changed during the last decades, as well as the extent in which the findings of MOFAs in Sweden are specific, alternatively, in line with what have been found in other countries. Together, this makes possible some references relating to established TNC theory.

In Part IV an attempt is made to qualify the general empirical findings, presented in Part III through an analysis of possible variations in integrated international production among four different types of MOFAs. In chapter 7, variations in integrated international production are analysed among MOFAs according to mode of entry, i.e. whether the affiliate has been established by means of green-field investment or acquisition. Chapters 8, 9 and 10 focus, respectively, on variations in integrated international production among MOFAs according to the absolute size of the affiliates, the international strategy of the affiliates and the Swedish industry cluster in which they operate. Each of these four chapters are organized in a similar manner, taking into consideration those aspect of integrated international production discussed in Part III: i.e. the extent of exports, imports, intra-firm trade and integration of other parts of the value chain. In chapter 11 an attempt is made to further substantiate the empirical findings on integrated international production by applying a statistical multiple-regression analysis in order to evaluate which determinants are most likely to affect the extent in which affiliates integrate their operations with other parts of parent corporations.

Part V, finally, contains chapter 12, which concludes the study and discusses the most important findings and relate these to established TNC theory.

2 SOME METHODOLOGICAL NOTES

2.1 Definitions and scope of the study

The study is focused on integrated international production among majority-owned foreign affiliates (MOFAs) in manufacturing, located in Sweden in 1993. For the sake of clarity, some definitions need to be made. First, the study focuses on "integrated international production". The expression "integrated" refers to those transactions that are performed between, and among, parent-firms and their affiliates which juridically are under common ownership, while the expression "international" refers to transactions between the affiliates located in Sweden and their parent- and/or sister-firms located outside Sweden. What should be made clear is that not all FDI entails integrated international production, as defined above. For example, if foreign affiliates of a TNC produce for the local market and exclusively purchase inputs and services from independent suppliers in the host market, and at the same time are managed autonomously from the parent-firm, the value-chain of that affiliate remains within the particular host country, and there is no integrated international production. Thus, whether FDI involves integrated international production, or not, is a function of the nature and purpose of TNC activity and the production and sourcing strategy of TNC management, rather than of foreign investment, *per se*. At the same time, not all transactions that are performed between juridically independent parties can be regarded as arm's-length transactions. In fact, a growing proportion of a firm's value-adding activities are often organized in an intermediate form, e.g. through joint-ventures, subcontracting, alliances or other types of inter-firm arrangements, involving commitments that go beyond simple market transactions at arm's-length, but not necessarily involving equity partnership. In the present study, however, transactions between units of a TNC and e.g. suppliers or joint-venture partners which may be based on long-term cooperative arrangements, but not including equity partnership, are not treated as integrated international production.

Second, international capital movements used to finance firms operating in other countries, may, broadly speaking, take two different forms: direct investments and portfolio investments. A direct investment implies a long-lasting relationship between an investor and the object, including the opportunity for real influence over the operations of the object. The aim of a foreign direct investment is to acquire a lasting interest in an enterprise operating in an economy other than that of the investor, the investors' purpose being to have an effective voice in the management of the enterprise. A foreign direct investment is often defined as an investors' minimum share of 10 percent of ownership in a firm (IMF 1993). Investments not motivated by the investors aim to gain control over the object, but only motivated by profit earning, are defined as portfolio investments. In this study, only those firms which directly or indirectly are majority-owned by foreign investors are included, that is, those firms where the foreign owners have a percentage of ownership exceeding 50 percent.

At the same time, it is well recognized that a large share of Swedish companies are based on foreign ownership in terms of portfolio investments. For example, among some 40 large Swedish corporations, accounting for around 90 percent of the total value at the Stockholm stock exchange in 1993, over 20 percent of the total stock value was owned by foreign investors. In four of these larger companies, foreign interests were responsible for a majority of investments (Sundqvist 1996).

It is important to notice that control of a firm in Sweden is not always based on a majority of invested capital, since legislation on joint-stock companies allows a differentiation of votes between two sets of shares, giving the so called "A-shares" substantially more votes compared to the "B-shares" where the voting strength may be insignificant. The result is often that, investors controlling the A-shares may also control the company, even if the invested capital is just a few percent of total capital, or that investors with a majority of invested capital have only a fraction of votes owing to their possession of the weaker B-shares. The firms included in this study are those where foreign owners control more than half of the votes in the firm, irrespective of the share of capital invested. Labels like foreign-owned "affiliates", "subsidiaries", "companies" and "firms" are used as similar expressions of the entities under consideration in the study, which, juridically and legally, are individual enterprises, majority owned and controlled by a foreign corporation. Data on juridically and legally non-individual entities, such as liaisons or branch plants of foreign-owned corporations, are not separately identified.

Third, information on MOFAs' homebases, i.e. the home-country of affiliates' parent-company, has been given by the respondents, and should normally indicate the location of the ultimate parent-corporation. This method of identifying the geographical homebases of the affiliates may be different from that applied by the official statistic-collecting authority, Statistics Sweden (Statistiska Centralbyrån, SCB), where the country of origin of the investing firm is treated as the affiliates' homebase, rather than the location of the ultimate owner. This may, for example, result in an affiliate established and financed by a US-based affiliate located in Germany, being treated as a German affiliate by official sources, but will be treated as US-based in this survey.

Fourth, the study is focused exclusively on manufacturing firms. The industry classification of the sample firms is given by Statistics Sweden, responsible for collecting and publishing data related to the manufacturing sector. The Swedish standard for classification of economic activities is identical to the United Nations' nomenclature, International Standard Industrial Classification (ISIC) from 1968, up to and including the four digit level and has, in addition, a two digit national sub-classification (Svensk Näringsgrensindelning, SNI). The manufacturing sector in Sweden includes the ISIC 2, 3 and 4 categories and consists, ideally, of all firms, with at least five employees, given an industry classification according to the total value added of manufactured products. However, as value added is difficult to obtain for individual products, the normal classification of individual firms (or individual establishments) is based on the sales value of the dominant manufactured product.

Fifth, it should also be taken into account that the study is a cross-sectional investigation, using data for the year of 1993. This means that data especially related to market conditions, as export/import figures, may be influenced by fluctuations in the domestic, as well as the international markets. The market situation for the total Swedish exports and imports in the beginning of the 1990s was characterized by stagnation or even recession, compared to the major trend of constant growth during the 1980s. Hence, the figures on the affiliates' degree of exports and imports are not measured in a period of general growth in foreign trade, but rather at a time when most international markets were stagnating. The collected data related to the organisation of sales and procurements through intra-firm trade, as well as the significance of intra-corporate integration of other parts of the value chain, are on the other hand probably less influenced by time-specific fluctuations, but more affected by longer-term strategic policies applied by the affiliates and their parent-corporation when running the manufacturing operations in Sweden.

Finally, all figures related to sales and purchases are provided by the respondents, i.e. the local managers of the affiliates in Sweden. All figures are received in the national currency, Swedish Crowns, (SEK), and all figures presented in the study refer to this currency. As a reference, in 1993 the average exchange rate was 7.78 SEK per US$ (IMF 1994).

2.2 The generality of collected data.

The study attempts to give an account of all foreign-owned manufacturing affiliates, operating in Sweden in 1993. For such a study, because of the large number of affiliates which had to be included, the data is collected through a structured, mailed, questionnaire. An alternative way of collecting information using a case-study method, focusing on a smaller number of firms, could of course have been applied. However, the usual restrictions of this method, when trying to generalize the findings to a larger sample of firms, were the main reason for not applying this approach. By using a method of collecting data through a questionnaire, it was believed that a large share of the identified foreign-owned manufacturing affiliates located in Sweden would be investigated.

The sample firms in this study have been identified by using the most comprehensive register available on foreign-owned firms in Sweden, provided by Statistics Sweden. The register includes manufacturing- and non- manufacturing firms established both as new firms, through green-field investments, as well as by acquisitions of existing firms. The foreign-owned firms in the register which have been acquired, have at least until 1992, mainly been identified by the official market controlling authority "Statens Pris och Konkurrensverk", SPK, which has been systematically collecting data on mergers and acquisitions in Sweden. From the SCB register of the year of 1992, which was the latest available, a total number of 690

foreign-owned manufacturing firms in Sweden can be identified.

The actual number of foreign-owned affiliates suitable for this study was found to be considerably lower, however, see table 2.1. Out of the 690 firms found in the 1992 SCB register, a total number of 326 (47%) needed to be omitted for various reasons. Excluded from the register were five main types of firms. The first type of excluded firms consisted of a number of affiliates of formerly domestically-owned firms, e.g. ASEA, now part of Asea-Brown Boveri, Switzerland, and Tetra Pak, after a merger with the Swedish-based global firm Alfa Laval in 1991, renamed Tetra Laval. In all, 90 affiliates, mainly members of these two corporations, were excluded from the register. This is due to the fact that while, juridically, they are to be seen as being part of TNCs based outside Sweden, functionally, they can also be seen as being part of domestic firms which have reached a level in the internationalization process where much of the operations have gradually moved abroad, including most of the headquarters functions and the legal status in juridical terms. As the focus in the present study is on foreign-owned affiliates which have been established by foreign TNCs in the traditional ways, i.e. green-field investments or acquisitions, affiliates of domestic corporations which have internationalized their operation to the extent where also the legal status has moved abroad, have been excluded.

Table 2.1 *The database on MOFAs located in Sweden 1993*

Number of foreign-owned companies in the 1992 SCB register	690	
Total non-relevant companies	326	
of which:		
non-manufacturing companies	82	
not foreign-owned	86	
affiliates of traditionally domestic owned firms, now juridically based abroad	90	
not possible to find (probably closed down)	24	
closed down, bankrupt, merger .	21	
juridically privately foreign-owned, without foreign operations	23	
Total number of possible respondents	364	
Eliminated	61	(17%)
of which:		
did not want to participate	13	
omitted due to insignificant size	5	
no returned questionnaire	43	
Completed responses	303	(83%)
of which 25 included information from more than one affiliate,		
which reduced the number of individual responses to	278	
Adding 18 affiliates identified from other sources	296	

The second type of excluded firms were a total number of 86 firms which were found not to be foreign-owned in any technical or juridical sense. Some of these firms had previously been foreign-owned, but were at present owned by domestic interests. Some had been acquired during recent years, while others have been domestically owned for a longer time, while a number of firms in the register had always been owned by Swedish interests.

The third type of excluded firms were 82 foreign firms not actually performing any manufacturing activity in Sweden. Most of these firms were found to be strictly sales companies, while some also, or exclusively, were engaged in various manufacturing- or business services, such as elevator installation, publishing, and property maintenance. A substantial number of these firms had previously performed manufacturing activities in Sweden, but had later decided to withdraw from manufacturing operations from Sweden.

The fourth category of excluded firms consisted of 45 firms which at the time of the questionnaire were found to be no longer existent or probably non-existent. 21 of these firms could be confirmed to have been closed down while another 24 were impossible to reach, indicating that they were non-existent.

The last category of excluded firms were 23 privately owned firms, juridically registered outside Sweden, but without any functional activity abroad. Most of these were small firms owned by non-Swedish citizens or owned by Swedish citizens and localized abroad due to various legislative reasons.

The 326 excluded firms were checked via telephone calls, whereby the given responses in the questionnaire on the firm's status could actually be confirmed. Out of an original 690 firms included in the 1992 SCB database on foreign-owned manufacturing companies in Sweden, a total of 364 affiliates were found to be potential respondents. Out of these foreign-owned affiliates, which were actually operating manufacturing activities in Sweden, 56 affiliates did not respond to the questionnaire, of which 13 were not willing to participate, mostly due to organizational restructuring. Five affiliates were excluded owing to their insignificant size.

Thus, it was possible to receive 303 usable responses, resulting in a very satisfactory 83 percent response rate. In total, 25 of the returned questionnaires included information on more than one affiliate. In these cases it was impossible to separate individual affiliates from each other. Instead, they had to be treated as one affiliate, hence, the total number of individual responses from the questionnaire decreased to 278. To this sample, 18 foreign-owned firms were added, identified through newspapers and business directories, giving a total sample of 296 respondents.

Even though the total response rate in the study is very satisfactory, reaching 83 percent of the potential respondents in the SCB register, it is not possible to know to what extent this register reflects the actual number of relevant foreign-owned affiliates in Sweden. By consulting one of the most comprehensive commercial

business directories (Sveriges största företag, 1992/93) including information on the legal status of Swedens' five thousand largest companies, measured by total sales figures, an attempt has been made to check the possible existence of a number of relevant affiliates not included in the SCB register. However, only a few relevant companies were identified through this complementary source.

2.3 Reliability of collected data

The data used in the study is based on information collected through a structured questionnaire. The questionnaire is provided in Appendix 1. A questionnaire has been used since none of the needed data was available, either from official sources such as trade-, and production statistics, or from the business press or literature. The official trade-, and production statistics consist only of aggregated data where the possibility of identifying firms of different categories are minimal or non-existent. Dependence on officially published data also minimizes the possibility of checking the empirical data, since no identification of individual firms is allowed, due to secrecy policies.

As in all cases when using a questionnaire, the information received may be substantially dependent on the respondents' subjective judgement and perceptions, especially when answers include statements based on interpretations. The character of collected data used in the study is, however, in large, based on quantitative figures on sales and purchases, which the executives of affiliates are handling on a regular basis. It is well recognized that measurements including intra-firm transactions, i.e. payment between units belonging to the same juridical corporation located in different countries, are problematic, due to problems of transfer pricing. These problems arise owing to the fact that prices paid for deliveries between different parts of a legal entity may diverge in relation to market prices. There are two main reasons for this. First, due to variations in tax legislation between different countries, companies may under- or over-evaluate payments for intra-firm transactions so that the total tax paid for profits world wide is minimized. Secondly, part of a TNCs intra-corporate delivery of parts and components may not have any market price, since these products are based on firm-specific proprietary knowledge, and not sold to independent customers at market prices. Instead, these products are only transacted between parent-firms and their, preferably, wholly-owned, affiliates, on the basis of other considerations than hypothetical market prices or marginal costs. In the present study it has not been possible to estimate the extent in which the value of sales and purchases between affiliates and other parts of their parent-corporation is affected by transfer pricing. Instead, the value of these transactions is exclusively based on the information provided by the respondents. Earlier estimates of the extent of transfer pricing among foreign manufacturing and non-manufacturing companies in Sweden in the mid-1970s (Joachimsson 1984), suggested that international enterprises in Sweden did not make very extensive use of their international structure to secure tax, customs or currency advantages. Although individual examples of payment patterns

indicated that international planning of this kind existed, e.g. Western Germany company dividend payments to Switzerland, these exceptions made no impact on overall results.

The findings on integration of various parts of the affiliates' value chains, e.g sections 6.3.5-6.3.7, are to a substantial extent based on interpretations by chief executives when answering the questionnaire, and should accordingly be interpreted with a higher degree of scepticism. However, this subjectivity may be seen as an advantage as the chief executives responding to the questions are normally the people best suited to interpret the main characteristics of their affiliate by using more subtle indications than may normally be secured by outsiders applying statistically and formally stringent methods, which nevertheless may miss essential dimensions of the objects under study.

The reliability of information, collected directly at the firm level, is normally substantially higher than those which could possibly have been collected from official sources, since they are un-filtered, primary data, not handled and published as aggregated secondary data by any official or commercial organisation. The information is received on the premise of confidential treatment, where no individual companies should be possible to identify. At the same time, since the collected information is not used as a basis for taxes, or regulations applied by government authorities, the motive for respondents to systematically leave incorrect information is also restricted. Since the data has been collected at the firm level, it has been possible to control the received information when this has been found necessary.

In order to receive consistent and reliable data on the affiliates' operations, interviews with the chief executives of some 25 affiliates were conducted first, mainly during spring 1993. Based on the experience gained from these interviews, a first questionnaire, consisting of a number of structured questions, was elaborated. The next step in shaping the database was to mail a test-questionnaire in September 1993 to 25 randomly chosen smaller firms in the SCB register on foreign-owned companies. A final questionnaire was thereafter created and, in October 1993, sent to all firms identified in the 1992 SCB register, followed up by a questionnaire reminding non-respondents, in November 1993.

In order to receive the most reliable data, the questionnaire was directed to the affiliates' general manager, alternatively the head of finance, as these executives were believed to be the most suitable respondents. In 56 percent of the affiliates, it was also the general manager who completed the questionnaire, and in another 30 percent, this was made by the head of finance, while in 14 percent of the questionnaires, this was completed by various types of executives, e.g. marketing directors and controllers. As the data was individually collected from each affiliate, it was also possible to check the received information or collect supplementing data when necessary.

Together, these circumstances are believed to have generated data with a sufficient high level of reliability.

2.3 Structure of sample firms

Some general characteristics of the sample firms are presented below. Firstly, as can be seen in Table 2.2, around 40 percent of MOFAs originate in one of the neighbouring Nordic countries of Finland, Denmark or Norway. Approximately 10 percent of affiliates originate in Germany, UK and United States, respectively, while the home-base for most of the other affiliates are other European countries. The "Other"

Table 2.2 *Home-countries of MOFAs located in Sweden 1993*

Home-country of parent-corporation	Number of affiliates	Percent of affiliates
Denmark	15	5
Finland	72	24
Norway	39	13
France	19	6
Germany	29	10
The Netherlands	23	8
Switzerland	20	7
UK	30	10
USA	33	11
Other	16	5
TOTAL	296	100

Source: Survey data by the author

Table 2.3 *MOFAs located in Sweden 1993, by industry (ISIC 1968)*

Industry	ISIC-code	Number of affiliates	Percent
Food products	311/312	17	6
Textiles, Wearing apparel	321/322	11	4
Wood products, Furniture	331/332	9	3
Paper and pulp	341	13	4
Printing, publishing	342	4	1
Industrial chemicals	351	28	9
Other chemical products	352	25	8
Petroleum, Coal products, Rubber products	354/355	4	1
Plastic products	356	12	4
Pottery, Glass, Non-metal products	361/362/369	21	7
Iron and steel-, Non-ferrous metals	371/372	14	5
Fabricated metal products excl. machinery	381	39	13
Machinery, except electrical	382	48	16
Electrical machinery and apparatus	383	19	6
Transport equipment	384	14	5
Professional goods	385	9	3
Other manufacturing industries	390	9	3
TOTAL		296	100

Source: Survey data by the author

category includes affiliates mainly from various European countries, and some few affiliates from Japan and Canada. Included in the "Other" category are also a small number of affiliates, jointly owned by parent-companies based in different countries.

The industry structure of the sample firms is presented in Table 2.3. Most affiliates operate in the non-electrical machinery (ISIC 382) and fabricated metal product (ISIC 381) industries, while fewest affiliates are found in the printing and publishing (ISIC 342) and petroleum and rubber (ISIC 354/355) industries.

According to the size of affiliate, in terms of employment, Table 2.4 shows that half of the affiliates employ less than 100 persons, while around 10 percent employ over 500 persons.

Table 2.4 *MOFAs located in Sweden 1993 in different size categories in terms of employees*

	Number of employees					
	-49	50-99	100-199	200-499	500-	N
Number	89	59	57	55	36	296
Percent	30	20	19	19	12	100

Source: Survey data by the author

Table 2.5 *Manufactured sales in MOFAs located in Sweden 1993. Number and percent.*

	Manufactured sales (MSEK)							
	-9	10-49	50-99	100-199	200-499	500-999	1000-	N
Number	16	79	44	61	55	24	17	296
Percent	5	26	15	21	19	8	6	100

Source: Survey data by the author

Finally, in terms of turnover, Table 2.5 shows that almost half of the affiliates have total manufactured sales below 100 million Swedish Crowns, while a small share of affiliates are considerably larger, with over 1 BnSEK in manufactured sales.

3. FOREIGN-OWNED MANUFACTURING TNCs IN SWEDEN. AN OVERVIEW
Some empirical findings of previous studies and official sources.

3.1 Introduction

In this chapter a review of some previous studies on foreign companies in the Swedish industry is provided, together with some statistical measurements found in various official sources. This review is to be seen as a general background to the empirical results of the current study. It also provides the possibility of making comparisons between the findings of the present study and historical trends on foreign TNCs' operations in Sweden. The review focuses on the following aspects of foreign TNCs' performance in the Swedish industry: absolute size, home-country-, industry- and size distribution, motives and modes of establishment, and lastly, on some effects on firm performance due to acquisitions by foreign TNCs. First, however, basic characteristics of the Swedish economy and some data related to total in- and outflows of FDI in Sweden will be presented.

3.2 Basic characteristics of the Swedish economy

Sweden is located at the Northern periphery of Europe. In terms of its area, Sweden is the fifth largest country in Europe, although sparsely populated. The size of the domestic market is relatively small, given the population size of less than 9 million. Over 85 percent of the inhabitants live in urban areas in the southern part of the country, predominately in the capital city of Stockholm, located on the east coast, and in two other metropolitan areas; Göteborg on the west coast, and Malmö in the very south.

As in most other developed countries, today, agriculture accounts for only a few percentages of the gross domestic product. Manufacturing accounts for less than one third, while the private and public service sector accounts for the largest share of GDP with more than one third. Compared to most other developed countries, Sweden has a relatively large public sector mainly due to the extensive welfare and educational system.

Sweden has rich resources of water power, coniferous forests, iron ores and other minerals. These natural resources have formed the basis for the establishment of the highly developed steel-based engineering industries, which, together with forest-based industries, remain the core of Swedish industrial activity. The major manufacturing industries are special steel, steel products, transport equipment, including aircraft, passenger cars, buses and heavy trucks. Furthermore, machine tools, electrical equipment, wood products, pulp and paper, chemicals and food products dominate. The expanding sectors of the manufacturing industry are typically those involving high technology products or where high technology in manufacturing is

required. Recently, the farmaceutical industry has became one of the most important, not the least in terms of exports. The industries, small as well as large, are sophisticated and specialized, with a high degree of mechanization, computerization and technology. The relatively high cost of the well-educated and trained labour have forced industry to become less labour intensive and more capital intensive in order to be competitive.

In contrast to many other European countries, the geographical locations of Swedens' manufacturing industry are not characterized by larger industrial belts, connected to metropolitan areas. Instead, the Swedish industry, in large affected by the locations of natural deposits of iron ores, wood products and water power, is characterized by punctual locations, often in more sparsely populated parts of the country. Although, in total terms, the majority of employment in the Swedish industry is located in the largest metropolitan areas, during most of the 20th century the more peripheral areas and smaller cites have grown in relative importance as a location for the manufacturing sector (Lundmark and Malmberg 1995).

In general terms, the geographical locations of individual industries show that, of the traditionally natural-resource dependent industries, the metal industry is found in the middle of Sweden, in the district of Bergslagen. The pulp and paper industry is located on the east-coast of the northern part of Sweden, and around the big lake Vänern, while the wood-products industry is concentrated to the inland of southern Sweden. The food industry is basically located in the fertile regions of Skåne, in the most southern part of Sweden. Of the industries, less dependent on domestic raw-materials, the chemical industry is mainly located on the Swedish west coast, north of Göteborg. In the dominant engineering industries, the machinery industry is traditionally located in larger metropolitan areas and other larger cities in the middle of Sweden, while the electronic industry is concentrated to Stockholm and some larger cities in the eastern parts of central Sweden. Finally, the locations of the important transportation industry is basically found in the cities of Göteborg and Trollhättan, in the western parts of Sweden (passenger cars, heavy trucks), at Södertälje, outside Stockholm (heavy trucks), while the aircraft industry is mainly located in the city of Linköping, in the eastern part of Sweden. (For a more detailed account of the structure as well as the geographical location of the Swedish industry, see SNA 1995).

Sweden is an open, free-trade dependent, country. For centuries Sweden has exported raw-materials such as metals and timber, but today finished goods, especially engineering and forest products dominate. The small population and the resulting small domestic market, especially for sophisticated and high-tech manufacturing, has made the export markets generally much more important than the domestic market. Around 40 percent of industrial output is exported, of which engineering products account for the majority. By international standards, a comparably large share of the total Swedish economy is based on international trade, where imports and exports account for between 35-40 percent of gross domestic products, respectively. Of exports, around 80 percent is manufactured exports. Around 70 percent of Swedens' trade is with Western Europe, of which the adjacent Nordic market is responsible for

around one fifth of the total. Today, the individually most important export-markets are found in Germany, the UK, the USA, Norway and Denmark, which, together, are responsible for almost half of total Swedish exports. Since 1960 Sweden has been a member of the European Free Trade Association (EFTA) but on January 1, 1995, Sweden became a regular member of the European Economic Community (EU). (For a more detailed account of the structure of Sweden's foreign trade, see Alvstam 1993).

Except for the traditionally public utilities, such as railroad, production and distribution of electricity, telephone, postal services and radio and television. the Swedish economy is based on private and free enterprise. Approximately 90 percent of all companies with over 50 employees are privately owned. Swedens manufacturing industry is characterized by a dual structure. On the one hand, the manufacturing sector is characterized by a large number of, predominately family-owned, small- and medium-sized companies which, basically are home-market oriented, with little or marginal direct exports. On the other hand, the Swedish manufacturing sector is dominated by a small number of large corporations, mainly based in the metal and engineering industries. These, few, large, corporations, often controlled by an even smaller number of finance families and industrial banks, are responsible for substantial shares of Swedens' total production, employment, exports, and R&D. Besides dominating the Swedish manufacturing industry, these firms are highly internationalized, many of which started production abroad as early as the end of the 19th or the beginning of the 20th century. Today most of these Swedish transnational corporations have a majority of their production, sales and employment abroad, at the same time as many export 75 percent, or more, of their Swedish production. Basically, because of the operations of these large corporations, in relative terms, this makes Sweden one of the most internationalized countries in the world.

In terms of Swedish policies regarding inward foreign direct investments, traditionally, this has been regulated through a complex system of overlapping governmental and private restrictions. In the early 1990s, however, the Swedish government substantially reorientated its policy in relation to inward FDI. Most fundamentally, restrictions on foreign ownership of Swedish firms have been liberalized. Foreign investors are no longer required to get permission to acquire shares in Swedish firms beyond certain levels, and legislation was enacted at the end of 1992 to prohibit discriminatory rules in company by-laws on share of ownership. Furthermore, foreigners will also be freer to create and transact their own operations in Sweden, since from 1992, they are no longer required to get permission to transact businesses in Sweden. The more liberal FDI-policies have also reduced or dropped restrictions on foreign investments in real estate; national security restrictions have been limited to arms and munitions, and the banking and financial sectors have largely been opened to competition. Principally, the only formal governmental restrictions for FDI relate to fishing, transport, and communication. Despite the liberalization of FDI policies, however, certain informal market barriers have the practical effect of

deterring foreign investments. These market barriers, which are either non-discriminatory between residents and non-residents, nor formally subject to the OECD instruments' liberalisation commitments, include a wide-ranging system of concessions and authorisations in the transport and communication sectors, the extent of closely-held company shares, and the level of concentration of the Swedish industry. (For a detailed account of Swedish FDI-policies, see OECD 1993a).

3.3 FDI in Sweden in the 1980s and early 1990s

Before studying the operations of foreign companies in the Swedish manufacturing sector, some indications related to total inward FDI-flows in Sweden will be discussed, since FDI is often treated as an important indicator of foreign involvement in domestic economies. However, it is also acknowledged that measurements based on FDI-figures generally underestimate the importance of foreign involvement, since no attention is normally given to e.g. foreign firms' reinvested earnings or investments based on locally-raised capital (UN-TCMD 1992a, Cantwell 1991).

The total inward and outward flows of FDI in Sweden 1980-93 are shown in figure 3.1. Traditionally, inward investments in Sweden have been relatively small, at least compared to the substantial amount of outward investments performed by a relatively small number of large and internationalized Swedish TNCs. On average the inward-to-outward ratio of FDI during the 1980s was only 0.18 which is among the lowest of all OECD-countries (OECD 1993a). In fact, only Japan shows a lower proportion of inward- compared to outward investments.

However the importance of inward investments in Sweden is less extreme, measured in relation to the gross domestic product, GDP. When inward FDI is measured in relation to GDP, Sweden occupies a middle position compared to other OECD countries. During the 1980s, inward FDI in Sweden was of the same size

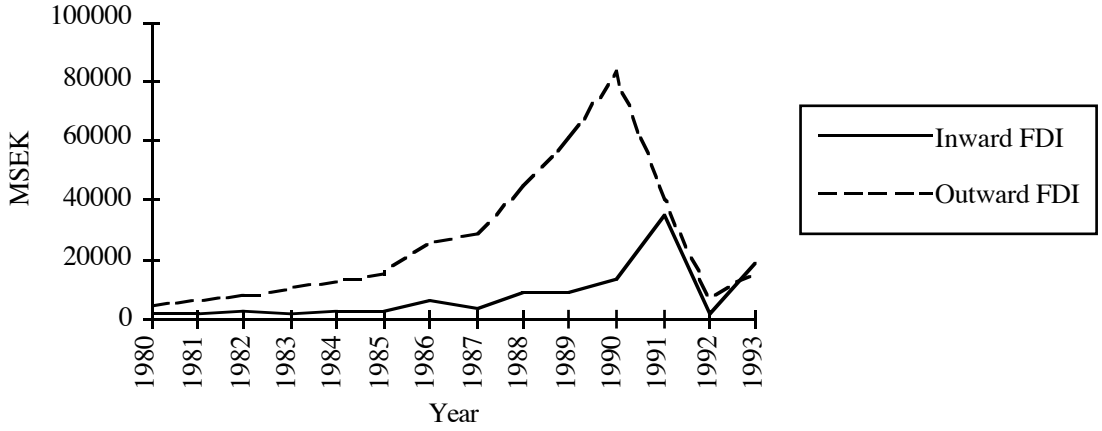


Figure 3.1 *Foreign direct investment flows in Sweden 1980-1993*

Source: National Bank of Sweden

as e.g. in France, Switzerland and the neighbouring Nordic countries, however less significant than in Belgium and the Netherlands (OECD 1993b).

The substantial increase in inward investments in the beginning of the 1990s was mainly related to three larger transactions: firstly to investments related to the plans for an alliance between Renault, (France) and Volvo (Sweden), in the automobile industry; secondly, to the acquisition of the Swedish TNC Alfa Laval by Tetra Pak, owned by a Swedish family but juridically based in the Netherlands; and thirdly, to investments related to General Motors' acquisition of 50 percent of Saab Automobile.

The geographical origins of inward investment in Sweden have changed successively. During the 1960s North American firms were responsible for more than half of the total inward investments. Although the USA still was the most important source-country of inward investments during the 1970s, Western European firms were responsible for some two-thirds of inward investments since the 1970s. During the 1980s, inward investments to Sweden from countries outside Western Europe have been insignificant. A gradual shift in the sectorial distribution of inward FDI also appeared in the 1980s, as some 75 percent of inward FDI in the late 1980s and in the early 1990s was directed to the manufacturing sector, while in the first half of the 1980s the inward investments was mainly directed to sectors such as retailing, hotel and restaurants.

3.4 Absolute and relative size of the foreign manufacturing sector

We now turn to a presentation of indications of the absolute and relative size of the foreign-owned manufacturing sector in Sweden, during various periods. According to the first comprehensive survey of foreign-owned companies in Sweden (Johansson, 1968), 149 manufacturing companies were located in Sweden at the beginning of the 1960s. The following thirty years have witnessed a very rapid increase in foreign establishments in the manufacturing industry, especially during the 1980s when the number of establishments doubled, reaching 651 in 1993, see table 3.1. The increase has, in fact, been even more pronounced than the figures in the table indicate, since prior to 1970 they include both majority- and minority-owned firms, while the figures from 1970 onward only relate to majority-owned firms. What should also be noticed are the different definitions used to identify foreign-owned companies in the various studies. Up to 1970 the definition of a foreign-owned company was based primarily on the share of stocks owned by a company legally based abroad. The minimum limit has varied between 10 percent for the period 1899-1960 to 50 percent in 1970-1993. From 1980, onward, the definition has been based on the share of votes actually controlled by companies legally based abroad. Included in the category of foreign-owned companies during this period, are companies where more than 50 percent of the votes are controlled by another company which is legally based abroad.

The absolute size of the employment in foreign-owned affiliates between 1899 and

Table 3.1 *Employment in foreign-owned manufacturing companies in Sweden 1899-1993*

Year	Number of companies	Absolute number of employees	Relative share in % of the Swedish industry
1899	n.a	18 867	6.6
1913	n.a	24 951	6.9
1929	n.a	19 100	4.2
1938	n.a	21 982	4.0
1962	149	41 136	4.4
1970	200	42 137	4.5
1972	230	44 270	4.9
1975	279	53 311	5.7
1979	317	53 925	5.8
1987	572	90 893	11.0
1990	648	123 886	14.0
1993	651	113 117	16.0

Note: The following different definitions of foreign-owned companies have been used in the various sources:
1899-1938 = At least 10% of the shares owned by foreign companies and representation in the board
1962 = At least 10% of the shares owned by foreign companies
1970-79 = More than 50% of the shares owned by foreign companies
1987-93 = More than 50% of the votes controlled by foreign companies
n.a = figures not available

Source: 1899-1938: Nordlund (1988), 1962: Johansson (1968), 1970-72: Statistics Sweden, SCB, Statistiska Meddelanden. ser. N, 1975-93: Statistics Sweden, SCB, Statistiska Meddelanden. ser. F.

1993 is also shown in table 3.1. The earliest estimates show that since the end of the 1880s and up to the interwar period, the absolute number of employees in foreign-owned enterprises in the Swedish manufacturing industry has fluctuated around 20 000 employees, with a peak of almost 25 000 employees in 1913. Notwithstanding the difficulties of comparing the size of the employment in foreign-owned affiliates due to different definitions, there is no question as to the great increase in the absolute numbers of employees in foreign-owned affiliates, especially during the 1970s and 1980s. In fact, the increase during the 1980s in the number of employees in foreign-owned affiliates in Sweden has been more than three times faster than the corresponding employment increase in affiliates abroad owned by the traditionally internationalized Swedish TNCs (Industridepartementet 1990).

Contrary to what has been hypothesized in previous studies by Johansson (1968), and Samuelsson (1977), Nordlund (1988) has shown that the relative share of the foreign-owned parts of the Swedish industry was greater, indicated by employment figures, by the beginning of the 20th century than in the 1970s. The share of foreign affiliates of the total employment in Swedish industry was nearly 7 percent both in 1899 and 1913, a figure not reached until at least the 1980s. The relative share of the employment in the Swedish industry by foreign-owned affiliates increased substantially during the 1980s and the beginning of the 1990s. In 1993, 16 percent of all employees in the Swedish industry worked in majority owned foreign enterprises.

Part of this increase during the 1970s and 1980s has been due to either mergers

between Swedish and foreign companies, e.g. between ASEA (Sweden) and Brown Boveri (Switzerland) in 1987, or the relocation abroad of the legal registration of formerly Swedish firms, due to tax legislation. It is true that formerly Swedish firms have to some degree moved their legal status abroad, whether due to mergers with foreign companies, tax legislation or any other reason. There is, however, no doubt that much of the growing influence by foreign affiliates in Swedish industry is due to an increase in inward FDI, especially during the 1970s and 1980s. The main vehicle for this has been the acquisition of Swedish firms, as will be discussed in section 3.10.

3.5 Country distribution

The country distribution of foreign-owned companies in Sweden has undergone some great changes during the 20th century, see table 3.2. Before World-War One, the foreign-owned manufacturing sector in Sweden was largely dominated by companies based in the neighbouring Nordic countries of Norway and Denmark. During the 1920s, companies from the bigger Western-European industrialized nations became dominant. A substantial expansion of employment in many German firms in the mineral- and armament industries, which were established at the beginning of the century, made firms from this country the most important in terms of employment by the end of the 1920s.

The 1930s witnessed the beginning of expansion of employment in American firms, which, from that time onwards and up to the end of the 1980s, became the most important source-country for foreign-owned manufacturing companies in Sweden.

Table 3.2 *Number of employees in foreign-owned companies in Sweden 1899-1993, by home-country of parent-corporation*

	1899	1913	1929	1938	1965	1970	1985	1990	1993
Denmark	2 668	3 056	2 883	3 363	2 812	3 680	3 545	4 973	5 737
Finland		693			317	1 380	11 152	27 485	19 021
Norway	7 203	9 197	5 321	5 930	1 069	1 840	8 270	13 083	8 291
The Netherlands	-	281	248	433	6 377	8 339	14 222	15 234	18 708
Switzerland	-	32	171	332	2 574	3 105	6 905	30 387[a]	26 149[a]
Germany	4 265	5 937	7 773	3 689	3 406	5 176	3 574	5 115	5 624
UK	4 057	4 331	832	2 316	5 743	6 728	8 638	8 475	6 240
France	96	51	248	600	356	403	1 223	3 643	4 567
Belgium	-	-	-	-	436	460	1 033	840[b]	802[b]
USA	-	44	1 075	4 470	16 477	25 016	16 609	13 458	14 075
Others	578	1 329	549	849	40	1 380	570	1 145	3 903
Total	18 867	24 951	19 100	21 982	39 607	57 507	75 746	123 886	113 117

a) incl Asea-Brown Boveri, b) including Luxembourg

Source: 1899-1938: Nordlund (1988), 1965 -1970: Samuelsson (1977), 1985-93: Statistics Sweden, Statistiska Meddelanden. ser. F

Early establishments of American manufacturing companies are to be found especially in the machine industry, where the location of International Harvester in Sweden in 1904 was the first manufacturing operation of that firm in Europe. The biggest foreign-owned company in Sweden at the beginning of the 1990s was the American-based International Business Machine Corporation, IBM, which began production of punch cards in Sweden in 1928. IBM is also one of the few foreign firms which have built their production capacity in Sweden mainly through green-field investments. In 1992, however, IBM decided to withdrawal from manufacturing in Sweden, when the affiliate that was producing printers was sold to a group of domestic investors.

After World War Two, companies from the Netherlands and Switzerland also became important as foreign investors in the Swedish manufacturing industry. The big expansion of employment in firms from the Netherlands after World War Two was due mainly to the activity of two larger firms, one of which the N.V. Philips Gloeilampenfabrieken, established in Sweden in 1923 as a green-field investment, and by the early 1960s the biggest foreign-owned company in Sweden in terms of employment. The other big investor after World War Two, which is at least partly based in the Netherlands, was the Unilever company which began manufacturing in Sweden in 1926. The original production of the Unilever company in Sweden in the Pre-War era was restricted to production of margarine, but larger acquisitions, including some of the biggest firms in the Swedish food industry, made Unilever one of the larger foreign-owned companies in Sweden today.

The establishment of manufacturing companies from Switzerland after World-War Two is also dominated by some larger firms. The Nestlé acquisition in 1962 of Findus AB, was up to that time the largest foreign acquisition ever in the Swedish food industry. Through this investment Nestlé became one of the leading firms in the Swedish food-industry and also one of the largest foreign-owned manufacturing firms of all kinds. The other big investor from Switzerland, responsible for the main parts of the increase in employment figures among foreign-owned companies in Sweden in the late 1980s, and the company that gives Switzerland the position as the leading source country of foreign investments in the manufacturing industry in the early 1990s, is the ABB-company, established in 1987 through a joint-venture between ASEA and Brown Boveri. ABB is now domiciled in Switzerland.

The fastest growing source country for foreign-owned firms in Sweden since the 1960s is Finland. In the middle of the 1960s Finnish investments in the Swedish manufacturing industry were almost non-existent, and even during the 1970s the employment figures of Finnish firms were relatively modest. The expansion of Finnish investments came during the 1980s, mainly through the acquisition of Swedish firms in the engineering- and chemical industries. Since 1975, Finnish firms have acquired some 150 manufacturing firms in Sweden, with 45 000 employees. At the beginning of the 1990s some 20 000 employees were working in Finnish owned manufacturing firms, a greater share of the total employment in the Swedish manufacturing industry than in firms from any other country, except Switzerland. If we also add firms from Denmark and Norway, we find that out of a total of 113 000 employees in all foreign-owned manufacturing companies in Sweden by the early 1990s, some 33 000, or

almost 30 percent, came from one of the Nordic neighbouring countries.

By comparing the source countries of the foreign-owned companies in Sweden in the early 1990s with the most important source countries of the Swedish imports, some discrepancies appear, see table 3.3. Worth noting is the lack of investments by especially Japanese and Italian manufacturing companies. Japanese establishments in Sweden consist in principle of non-manufacturing companies, concentrated to retailing and warehousing. In the late 1980s only a handful of Japanese-owned companies were carrying out manufacturing in Sweden (Strandell 1991), while, in 1994, 11 manufacturing companies with Japanese interests were established in Sweden (Alvstam and Ivarsson 1995).

Table 3.3 *Home countries of foreign-owned companies and source countries of Swedish imports 1993. Percentages.*

	Shares of employees in foreign manufacturing sector	Shares of total Swedish imports
Denmark	5	7
Finland	17	6
Norway	7	6
The Netherlands	16	4
Switzerland	23	2
Germany	5	17
UK	5	9
France	4	5
Belgium / Luxembourg	1	3
Italy	0	4
USA	12	9
Japan	0	5
Others	4	22
TOTAL	100	100

Source: Statistics Sweden (1994), Statistiska Meddelanden, F 18, Statistics Sweden (1993a), Utrikeshandel, Årsstatistik

3.6 Industry distribution

The industry composition of foreign-owned companies in Sweden has also undergone some major changes during the 20th century, see table 3.4. At the beginning of the century and up to the late 1920s, employment in foreign-owned companies was mainly concentrated to industries based on domestically-located natural resources, chiefly the non-metallic mineral industry and the wood products- and furniture industry. Also, in other industries, as in the metal products,- machinery,- and equipment industry, the mining-, and textile industries, employment by foreign-owned affiliates was relatively high. Three of the most dominant industries in terms of employment at the beginning of the 20th century, i.e. the non-metallic mineral

Table 3.4 *Number of employees in foreign-owned companies in Sweden 1899-1993, by industry*

Industry	1899	1913	1929	1938	1962	1970	1980	1990	1993
Mining and quarrying	1 903	3 141	1 226	1 846	na	16	na	na	na
Food, beverages and tobacco	1 113	1 164	662	1 505	3 464	4 116	8 693	13 645	14 220
Textiles,wearing apparel	2 245[a]	3 284[a]	2 070[a]	2 552[a]	3 697[a]	2 443	2 053	1 562	2 013
Wood products and furniture	5 128	3 595	773	703	574	318	456	1 648	1 297
Paper, printing and publishing	910	3 018	2 478	2 994	4 170	3 192	2 973	9 310	7 071
Chemical,petroleum, plastics	558	960	736	1 471	5 486	9 072	8 595	17 289	13 205
Non-metallic mineral products	5 682	6 361	5 802	2 356	1 781	289	1 910	7 703	5 974
Basic metal industries	0	0	0	0	0	1 775	1 895	2 364	4 307
Metal products, machinery and equipment	1 328	3 428	5 344	8 546	21 964[b]	20 471	28 572	69 166	63 802
Other industries	0	0	9	9	0	0	461	0	na
Total	18 867	24 951	19 100	21 982	41 136	42 153	56 082	123 886	113 117

a) incl leather and rubber industries, b) incl metal industries

Source: 1899-1938: Nordlund (1988), 1962: Johansson (1968), 1970: Statistics Sweden, Statistiska Meddelanden. ser. N, 1980-93: Statistics Sweden, Statistiska Meddelanden. ser. F

industry, the wood products- and furniture industry and the mining industry, have all undergone considerable changes during the century.

The greatest changes are to be seen in the non-metallic mineral industry, which represented most employees in foreign-owned companies up to the end of the 1920s. During the following 40 years foreign investments in this industry decreased constantly, and by 1970 was almost non-existent. Through some major acquisitions of Swedish firms during the 1970s, and especially during the 1980s, exemplified by the acquisition of the big Swedish manufacturer of mineral wool, Gullfiber, in 1986, with 1100 employees, by the French TNC St.Gobain, the number of employees in this industry has once again become significant. At the beginning of the 1990s the relative importance of foreign firms with respect to total employment is in fact greater in the non-metallic mineral industry than in any other of the Swedish manufacturing industries.

The other dominant industry at the beginning of the 20th century, the wood products- and furniture industry, shows a downward trend in the absolute number of employees by foreign-owned firms during the whole of the century. This trend continues up to the beginning of the 1970s, when the number of employees was at a minimum. Even if an increase can be seen, especially during the 1980s, the wood industry and the textile industry are the two single industries in Sweden today where foreign-owned affiliates are the least active.

From the late 1920s onwards, the majority of employment in foreign-owned affiliates in Sweden has been concentrated to the metal products,- machinery,- and equipment industries. There has been a considerable increase in the absolute numbers,

first during the post-war period up to the beginning of the 1960s, and more recently during the 1980s when the absolute number of employees in this industry more than doubled, from nearly 30 000 employees in 1980 to nearly 70 000 in 1990.

The second biggest industry in the early 1990s, in terms of employment, is the food industry with some 14 000 employees in 1993. This industry showed relatively stable employment figures up to the beginning of the 1960s, with the exception of during the late 1920s, when the figures were down to a minimum. The fastest expansion of employment in this industry came during the 1970s, when the absolute number of employees doubled from approximately 4 000 in 1970 to almost 9 000 in 1980. The expansion of foreign-owned companies in this industry continued even during the 1980s, although at a lower rate of increase.

The third largest industry in the early 1990s, in terms of employment by foreign-owned companies, is the chemical industry, which employed some 13 000 people in 1993. The absolute number of people employed by foreign-owned affiliates in this industry was up to the beginning of the 1960s relatively low. The expansion of this industry was especially marked during the 1960s and 1980s when the absolute number of employees doubled.

If instead of studying the absolute figures, we focus on the relative importance of the foreign-owned companies to the total employment in various industries a somewhat different pattern appears. As can be seen in table 3.5 the relative importance of foreign-owned companies, in terms of employment, was greatest in

Table 3.5 *Relative shares of employment in foreign-owned affiliates in different industries in Sweden 1899-1993. Percent.*

Industry	1899	1913	1929	1938	1962	1970	1980	1990	1993
Mining and quarrying	13.6	23.1	11.2	8.4	na	0.6	na	na	na
Food, beverages and tobacco	3.8	3.2	1.8	3.0	4.8	4.9	12	19	21
Textiles,wearing apparel, leather	5.2[e]	6.2[e]	3.1[e]	3.0[e]	2.8	3.4	8	6	12
Leather- and rubber	4.1	4.4	1.5	0.3	a	a	a	a	a
Wood products and furniture	7.3	6.2	1.2	1.1	0.8	0.6	1	3	3
Paper, printing and publishing	11.2	10.8	5.9	6.4	3.8	2.9	3	8	7
Graphical	0.8	0.6	1.2	1.2	b	b	b	b	b
Chemical,petroleum, plastics	11.4	6.7	5.5	9.8	13.2	12.5	12	25	23
Non-metallic mineral products	13.2	14.4	14.2	5.8	4.2	1.0	8	33	32
Basic metal industries	na	na	na	na	c	2.7	5	6	14
Metal products, machinery and equipment	2.4	3.5	4.2	4.5	4.7[d]	5.3	7	16	19
Other industries	na	na	na	na	na	6.6	na	na	na
Total manufacturing sector	6.6	6.9	4.2	4.0	4.4	4.5	6	14	16

a) part of textile- and chemical industry, b) part of pulp industry, c) part of metal products, machinery and equipment industry, d) incl metal industry, e) excl leather industry

Source: 1899-1938: Nordlund (1988), 1962: Johansson (1968), 1970: Statistics Sweden, SCB, Statistiska Meddelanden. ser. N, 1980-93: Statistics Sweden, SCB, Statistiska Meddelanden. ser. F

the mining-, non metallic mineral-, chemical-, and paper industries during the whole of the 20th century up to the Second World-War. Two of the industries where the share of total employment by foreign-owned companies was among the highest at the beginning of the century, i.e the non-metallic mineral industry and the chemical industry, also exhibit the highest shares today. In the case of the Swedish non-metallic mineral industry, the importance of foreign companies, in terms of employment, was diminishing from the time of the Second World-War until the beginning of the 1970s. During the 1970s and especially during the 1980s, the share of employment by foreign-owned affiliates in this industry increased quicker than in any other industry, and represents as much as one third of all employees in 1993. No other Swedish industry is as dependent on non-domestic firms as this industry. In the case of the Swedish chemical industry, the importance of foreign-owned companies during the first half of the 20th century has continued even in the Post-War period, with a substantial increase during the 1980s, when as much as a quarter of the total employment in the industry was to be found in foreign owned affiliates. The mining-, and paper industries, which also showed significant shares of employment by foreign-owned companies during the beginning of the century, are today, to a substantial degree, dominated by domestic firms. Instead, non-domestic firms have increased their shares of the total employment during the Post-War period in the food industry and in the metal products-, machinery- and equipment industry.

In the food industry, most of the expansion could be witnessed from the beginning of the 1970s until today, when around one fifth of all employees work in foreign-owned firms. The importance of non-domestic firms in the metal products-, machinery- and equipment industry has been relatively stable during most of the century until the 1980s, when an increase in the investments of foreign-owned TNCs resulted in a situation where almost 20 percent of the employees in 1990 are to be found in firms controlled by foreign TNCs. In the textile-, and basic metal industries, between 12 and 15 percent of all employees are found in foreign-owned firms. In the wood products- and paper and publishing industries, foreign-owned TNCs are relatively non active, with only 7 percent or less of the employment in each industry in 1993.

3.7 Size distribution

The foreign-owned sector in the Swedish manufacturing industry is dominated by relatively large enterprises, measured by Swedish standards. An estimate of the size-structure of foreign-owned companies by 1970 (Samuelsson 1977) concluded that a relatively small share of the foreign-owned companies was to be found in the smallest category of manufacturing firms, i.e firms with less than 20 employees, while 80 percent were working in companies with more than 200 employees. Approximately one fourth of the foreign-owned affiliates in 1970 had more than 200 employees, while the corresponding figure for the domestic-owned companies was only 4

percent. On the other hand, the absolute size of the foreign-owned companies in the category of more than 500 employees was only half as big, on an average, as comparable domestic firms. The affiliates based in the UK and the Netherlands were found to be characterized by a significant size, while affiliates based in any of the neighbouring Nordic countries in general were relatively small.

The importance of relatively large foreign-owned enterprises is also indicated in a survey of the situation by the time of 1986 (SOU 1989: 37). The foreign-owned enterprises were clearly over-represented during this year in categories of firms with 200-499 and 500-999 employees, and at the same time under-represented in categories of smaller firms with less than 50 employees. In 1994, almost three quarters of all employees in foreign owned companies in the Swedish manufacturing industry, worked in companies with more than 200 employees, while only 13 percent were employed in companies with less than 100 persons, see Table 3.6.

Table 3.6 *Employees in foreign-owned companies in Sweden 1994, by size of company*

	0-19	20-49	50-99	100-199	200-	Total
Total number of employees	1 127	4 723	8 543	14 454	80 190	109 037
Percent	1	4	8	13	74	100

Source: *Statistiska Meddelanden*, Serie F18, SM 9501, Foreign-Owned Enterprises 1994, Statistics Sweden, SCB

3.8 Geographical location

The geographical location of foreign-owned manufacturing companies in Sweden in 1994 is shown in Figure 3.2. As can be seen, in terms of employment, the metropolitan region of Malmö, in the very south, and the capital region of Stockholm dominates. In these two regions, 16 percent and 12 percent respectively, of the total employment in foreign-owned manufacturing companies are found. Other regions with a large number of employees in foreign-owned companies, accounting for around 7-8 percent of the total, include the counties of Västmanland, in the middle of Sweden, and Värmland, to the north of the big lake Vänern. Notice that, in the northern part of Sweden, foreign-owned companies employ only very few persons.

3.9 Motives for establishment

The most comprehensive study of the motives of inward direct investments in Sweden after 1945 is provided by Samuelsson (1977), who analysed the motivation for foreign TNCs to undertake investments and establish production facilities in Sweden after World War Two. This study, founded on the theoretical tradition which sees the

Source: Foreign Owned Enterprises 1994, *Statistiska Meddelanden*, Serie F18 SM 9501, SCB

Figure 3.2 *Geographical locations of MOFAs operating in the Swedish manufacturing industry 1994. Percent of total number of employees in different regions (län)*

explanation of FDI in a combination of enterprise-specific and nationally (locationally) specific, competitive advantages, analysed a cross-industrial data of foreign-owned affiliates for the year 1970. In this study, a significant negative correlation was found between the market- and production- shares of the TNCs and the existence of Swedish multinational companies in various industries. This was taken as an indication that the existence of Swedish TNCs in an industry constituted a counterpoise to foreign TNCs, making it more difficult for these to gain influence in industries dominated by domestic TNCs. The analysis suggested that the foreign TNCs preferred to produce in, rather than, export to Sweden in two different cases.The first of these cases was when foreign TNCs could benefit from Sweden's comparative advantages in skilled worker-intensive production, i.e. when the possibility existed of utilizing this production factor, which was relatively cheap in Sweden compared to other countries. This motive was especially significant among American firms. Secondly, production in Sweden was also preferred in those cases where goods transfer costs were high, mainly due to high tariffs and heavy transport costs. This motive for local production was especially found among Western European firms. Finally. the result from this study suggested that the North American firms to a great extent used Sweden as a production base from which to supply markets in other countries, while Western European firms produced in Sweden mainly in order to supply the local market.

Another perspective on the reasons for inward direct investments focuses more on strategy-related factors, especially in oligopolistic markets characterized by fierce competition. Instead of viewing FDI as solely determined by the exploitation in foreign markets of firm-specific advantages, already controlled by a company, this perspective sees FDI more as a vehicle to acquire such firm-specific advantages via the acquisition of competitors. The surveys which have tried to investigate to what extent domestic firms have been acquired on account of a relatively higher R&D or technology intensity, have resulted in disparate findings. In a study by Erland (1980), based on Swedish firms acquired by foreign companies during the 1967-74 period, it was concluded that the acquired firms, taken as a group, were not more R&D intensive than comparable domestic companies in respective industries. However, Lipsey and Swedenborg (1981) found among acquired Swedish firms between 1961 and 1970, that these were more technology-intensive than non-acquired firms, which could be taken as an indication that the motivation for the acquisition was related to the desire of the foreign TNCs to capture firm-specific advantages. Analysis of the main motives for foreign TNCs acquiring domestic firms in the food industry in the 1970s (SIND 1977:10), indicated also that this could be largely related to the considerable progress which Swedish food companies had made in the manufacturing know-how of certain products, i.e. in the fresh-frozen food sector. The reason for inward FDI in this industry seemed accordingly to a significant degree to be associated with the acquisition of firm-specific advantages held by the Swedish firms, rather than the exploitation of advantages already controlled by the foreign TNCs.

3.10 Modes of entry

The way of carrying out FDI in Sweden has shifted over the years. It has been estimated than more than 80 percent of the total establishments of foreign-owned manufacturing- and sales companies in Sweden during the period 1895-1945, were green-field investments (Nordlund 1988). After World War Two the acquisition of Swedish firms became the normal way of establishing companies in Sweden. By the year 1970 about half of the production and employment in foreign-owned manufacturing companies came from those former Swedish companies which had been acquired by foreign TNCs (Samuelsson, 1977). The majority (60%) of the American and Western-European companies, excluding those from the Nordic countries, were established by acquisition, while the Nordic-based companies from Denmark, Norway and Finland for the most part (70%) were established by green-field investments.

In the middle of the 1970s, most of the biggest foreign-owned companies in Sweden were established through acquisitions, or had at least become one of the ten largest foreign-owned companies through the acquisitions of formerly Swedish firms (SOU 1975:50). Totally, 466 foreign-owned companies, with some 14 600 employees, were established in Sweden in the period 1973-1979. Almost 70 percent of these affiliates, representing as many as 93 percent of all employees, were established via acquisition. The companies established via green-field investments were dominated by very small firms (Statistics Sweden, Statistiska Meddelanden Ser. N 1975, Ser. F 1976-81).

The dominant trend of establishing manufacturing facilities in Sweden by way of acquisitions continued even during the 1980s. According to statistics on all economic sectors, including manufacturing as well as non-manufacturing firms, 250 foreign-owned companies with only 970 employees have been established via green-field investments in Sweden during 1980-1983 (Industridepartementet 1985). As can be seen in table 3.7, both the number of foreign-owned manufacturing companies established via acquisition and the number of employees in the acquired firms, have been rising dramatically in Sweden during the post-war period. The big boom of the acquisition activity by foreign TNCs started at the beginning of the 1960s, accelerated during the first half of the 1970s, and exploded during the second half of the 1980s, when almost 240 manufacturing firms in Sweden with more than 50 000 employees were bought by foreign TNCs.

3.11 Effects on firm-performance due to acquisitions

As has already been shown, the majority of foreign-owned manufacturing companies in Sweden today were established through the acquisition of already existing firms. The strategy of acquisition used by the foreign companies can to a significant degree influence the future performance, primarily of the acquired firm, in terms of export-

Table 3.7 *Number of majority owned manufacturing companies in Sweden established by acquisitions 1946-91. Gross figures.*

Period	Number of companies established by acquisition	Number of employees by time of acquisition
1946-49	4	240
1950-54	2	282
1955-59	4	380
1960-64	46	4415
1965-69	74	12 033
1970-74	115	14 408
1975-79	77	11 470
1980-84	162	18 887
1985-89	238	52 423
1990-91	75	73 530[a]
Total 1946-89	797	188 113

a) Including General Motors' acquisition of 50% in Saab Automobile, and Tetra Pak's acquisition of Alfa Laval

Source: 1946-69: Rydén (1971), 1970-89: Compiled from: Statens Pris- och Konkurrensverk, SPK, Aktuellt om fusioner, 1990-91: Compiled from: Statens Pris- och Konkurrensverk, SPK, Karteller & Fusioner

patterns, product-and market-specialization and R&D. Some few investigations of the performance of formerly Swedish owned firms which have been acquired by foreign TNCs are available. These studies focus mainly on changes in certain variables such as exports, employment, investments and so on, due to the acquisition. In a study of 92 Swedish family-owned manufacturing enterprises acquired by foreign companies between 1970-76 (SIND 1978:4), it was found that the acquired firms usually were relatively small niche-firms, i.e. were dominating a very narrow segment of an industry, while the acquirer, on the other hand, often was a big multinational enterprise. The acquisitions were often also characterized by motives of vertical integration, where the acquirer had already established business-relations before the take-over, either as a customer or as a supplier, with the Swedish firm. The distribution and marketing organizations of the Swedish firms were often considered critical when entering or strengthening the position of the foreign companies on the Swedish market. In general, the acquired firms showed a relative decrease, both in employment and turnover, after the acquisition. Furthermore, the investment volume per employee showed a stagnation, while an improvement in other variables appeared, especially in terms of solidity and profitability.

Another study of 56 domestically owned firms (SOU 1989:37) which were acquired by foreign TNCs during the 1970s indicated that acquired firms, by the time of the first half of the 1980s, exhibited a more positive development in terms of

employment and exports, a more negative development trend in solidity, while the development of profitability was the same as for all manufacturing firms in Sweden. In general, earlier acquisitions showed a significantly weaker development in all variables, compared to firms that had been acquired more recently.

The study above was also focused on variations in firm-performance due to different strategies or motives behind the acquisition. The performance of the domestic firms was thought to be influenced in different ways, as the motives for the acquisition varied between five different types of acquisitions, namely horizontal- (between firms operating in the same industries and on the same markets), market expanding-, complementary-, vertical-, and conglomerative- acquisitions, respectively.

When looking at differences between countries concerning different types of acquisitions, it was found that firms from the neighbouring countries of Norway and Finland usually made acquisitions of the horizontal type, while those of the Americans and the British were often market-expanding.

In terms of export-value, all acquired firms exhibited a substantially lower rate of increase, compared to all manufacturing firms in Sweden. This was especially significant among firms that had been acquired through motives of market-expansion. In a majority of all of the acquisitions, and especially in the horizontal type, a coordination of the firms' markets occurred in Sweden as well as abroad, as the foreign company either used the market-organization of the acquired firm or took it over altogether. The latter situation was especially frequent when the foreign firm was based in one of the Nordic countries.

Coordination of foreign markets appeared in situations where the foreign company was based in any of the Nordic countries or in America, but the method of coordination varied, as usually the Nordic firms were interested in the whole market organization abroad, while the American firms often focused on the possibility of market-specialization.

It was concluded in the study that the effects of an acquisition on the autonomy and performance of the acquired firm to a significant degree seemed to vary with the strategic motives behind the acquisition. Horizontal acquisitions were in general accompanied both by a greater degree of coordination, related to production, markets and R&D, and a much weaker position in terms of autonomy, compared to the market-expanding- and complementary types of acquisitions. The cases of vertical- and conglomerative acquisitions were found to be too few to generate any hypotheses about specific firm-performances, due to these strategic situations.

A significant variation in the firm-performance of acquisitions made in the same strategic situation was also found, determined mainly by two factors: the acquired firms' size in relation to the foreign acquirer and the degree of internationalization. A large relative size of the acquired firm, especially in combination with a significant degree of internationalization, was a factor which could imply a concentration of production-, R&D- and marketing responsibility to the acquired firm, and also a more extensive autonomy in operative- and strategic decisions.

A small relative size, on the other hand, decreased the probability of autonomy,

restricting the acquired firms mainly to operative responsibility of smaller market- and/or product areas. If the acquired firms were at all allowed to keep their own sales organization, a strong dependence on the market organization of the foreign-owned companies appeared or, as in situations of market-expanding acquisitions, a market restriction appeared where the acquired firms were given responsibility over certain geographical markets. When the smaller acquired firms also showed a low degree of internationalization, this responsibility was often restricted to the local market.

3.12 Exports by foreign affiliates

The contribution to Sweden's external trade, by foreign-owned TNCs located in Sweden, has been investigated in some previous studies. First, however, it should be noticed that the export behaviour of foreign-owned TNCs is not a direct reflection of export-regulating policies in Sweden, since no such policies are applied by the Swedish government.

An early estimate of export-performance by foreign affiliates in Sweden was made by Johansson (1968). In this study it was found that a big majority, or 80 percent, of 337 investigated foreign-owned affiliates had none or only marginal exports in the beginning of the 1960s, while 67, or one fifth of all foreign-owned companies were exporting at least 10 percent of their total sales. Of these exporting companies, 25 were based in North America and 20 in one of the neighbouring Nordic countries. In 23 of the exporting companies, the geographical distribution of the exports was concentrated to the Nordic countries alone, and in 27 companies the export was restricted to the EFTA countries. Exports to the EEC countries were performed by 36 companies, of which all but 7 also exported to EFTA countries. In total 14 of the companies exported to the USA and another 16 were exporting to countries outside USA, EEC and EFTA.

In principle, two types of affiliates were found among those who used Sweden as a production-base for exports to larger markets abroad. The first type of exporting affiliates consisted of a number of old and large affiliates which had been established in Sweden in the pre-war or inter-war periods. The second kind of exporting affiliates consisted of formerly Swedish owned companies that even before the acquisition by the foreign TNC had been carrying out exports on a larger scale. Very few of the affiliates established after World War Two exported to the EFTA market. It was also found in this study that only very few of the exporting affiliates could be characterized as being functionally specialized production units, belonging to international corporations with integrated border-crossing transfers of commodities.

Table 3.8 summarizes some findings of the export-performance of foreign companies in Sweden during the period 1970-91. According to one study (Samuelsson 1977), foreign TNCs accounted for nearly 7 percent of Sweden's total export in 1970. This figure for total shares of Swedish exports was later also

Table 3.8 Export-performance of foreign-owned manufacturing companies in Sweden *1970-1991. Percent.*

	1970	1973	1979	1986	1988	1989	1990	1991
Share of Swedish manufacturing exports	7	7	n.a.	14	18	19	20	22
Export-intensity (Export/Total sales)	37	n.a	38	n.a	44	n.a	40	43

n.a. Not available

Source: 1970: Samuelsson (1977); 1973: SOU (1975:50); 1979: SOU (1982:15); 1986: SOU (1989:37); 1988: NUTEK (1992); 1989: NUTEK (1993); 1990, 1991: NUTEK (1994)

confirmed by a government study (SOU 1975:50) for the year 1973. Increasingly, higher shares of total Swedish exports by foreign affiliates have been noticed during the 1980s. In 1986 the share was estimated at 14 percent of total Swedish industry-exports (SOU 1989:37), while the most up-to-date figures for the export-performance by foreign affiliates show that this had increased to 22 percent of the total Swedish industry export in 1991 (NUTEK 1994).

Part of an explanation for these increases is probably to be found in the wave of acquisitions during the 1980s, when foreign companies acquired a substantial number of domestic-owned firms, some with long export experience. Included in the figures for 1989 and onwards, in table 3.8, is also the highly internationalized ABB company.

Export patterns of foreign-owned affiliates based in different countries have shown that, in the 1970's, American affiliates in particular, exported more than 60 percent of all sales to several European markets, while firms from Western Europe only exported less than 25 percent of total sales (Samuelsson 1977). By the beginning of the 1990s the differences in export intensities among affiliates based in different countries had been reduced. In 1991, North American affiliates exported 55 percent of their total output, while corresponding figures for affiliates based in EC and EFTA countries were 42 and 49 percent respectively (Andersson 1994).

The aggregate figures for the foreign TNCs export-performance presented above also conceal big differences between industries. Estimates in the beginning of the 1970s (Samuelsson 1977) indicated that production by foreign TNCs in industries with a high share of consumer goods, e.g. the food industry and parts of the chemical industry, in principle were import-substituting, as the export share of these companies only reached 10 percent of their production. while foreign companies in industries with a high degree of producer-goods, e.g. the electro-, iron-, and petroleum industries showed significant export shares, exporting more than half of their output. In these industries the foreign TNCs exported higher shares than comparable Swedish firms.

Estimates of exports by foreign affiliates in different industries in the middle of the 1980s (SOU 1989: 37) show that, in some industrial sectors, export was considerably dependent on foreign affiliates, e.g. in the food- and non-metallic mineral products industries, where 40-50 percent of the total production was exported through

foreign-owned affiliates. Dependence on exports by foreign affiliates in the wood product-, basic metal-, and the metal products, machinery and equipment industries was on the other hand modest, with less than 10 percent of total export, respectively.

Varied attempts to estimate differences in export-performance among foreign affiliates and domestic firms indicate some shifting results. Estimates from the beginning of the 1970s (Samuelsson 1977) indicate that foreign TNCs exported more than a third (37%) of their production, which was found to be a higher share than among all Swedish companies. However, more detailed analysis of the export-performance among foreign and domestic firms in the late 1970s, indicated that foreign TNCs were more export-intensive than domestic companies without foreign affiliates, but less export-intensive than Swedish TNCs (SOU 1982:15). Foreign TNCs in Sweden had an export-intensity, measured as the value of export compared to total sales, of 38 percent. In comparison, it was shown that domestic Swedish TNCs had an export-intensity of 62 percent, while domestic firms without any foreign affiliates outside Sweden, had an export-intensity of 25 percent of total sales.

More recent indications of export intensities among foreign and domestic firms in Sweden show that in 1988 foreign affiliates were exporting 44 percent of total sales, or almost the same figure as for all manufacturing firms in Sweden. Although foreign affiliates seem to be less export-intensive than a very small group of the most internationalized Swedish TNCs, the foreign affiliates were just as export-intensive as all other Swedish TNCs, and substantially more export-intensive than domestic firms without foreign production (Industridepartementet 1991).

The most recently available estimates of export-performance among domestic and foreign-owned affiliates operating in different industries are presented in table 3.9, showing the export-intensity, as well as the share of total Swedish exports in goods

Table 3.9 *Export-performance among domestic firms and foreign-owned affiliates in Sweden 1991, by industry (ISIC 2-digit level).*

	Share of total Swedish exports		Export-intensity	
Industry	Domestic firms	Foreign-owned affiliates	Domestic firms	Foreign-owned affiliates
Food	57	44	3	13
Textiles	71	29	17	41
Wood-products	96	4	15	29
Pulp and paper	86	14	38	58
Chemical	68	32	38	41
Non-metallic minerals	39	62	5	19
Iron and steel	76	24	44	52
Engineering	78	22	45	48
TOTAL	78	22	33	43

Note: Share of total Swedish exports: share of total value of Swedish exports of goods and services in companies with more than 50 employees. Export-intensity: export share in total sales

Source: NUTEK (1994)

and services, accounted for by domestic and foreign-owned firms with more than 50 employees in 1991. According to this estimate, foreign-owned affiliates were in 1991 responsible for 22 percent of total Swedish exports in goods and services, and especially important in the non-metallic mineral-, and food industries, with 62 percent and 44 percent, respectively of total Swedish exports. The lowest shares of total exports accounted for by foreign-owned affiliates can be found in the wood-products (4%) and in the pulp- and paper industry with 4 percent and 14 percent respectively, of the total Swedish exports.

In terms of export-intensity, foreign-owned affiliates seem to be more export-intensive as a whole, compared to all domestic firms, as 43 percent of total sales of goods and services are exported among foreign-owned affiliates, compared to 33 percent among domestic firms. Significantly higher proportions of exports among the foreign-owned affiliates, can be found in the textiles-, wood-products-, pulp-and paper- and non-metallic mineral industries. In the pulp- and paper and iron- and steel industries, more than half of total sales are exported, while the foreign-owned affiliates operating in the engineering industry exported almost half of total sales.

3.13 Intra-firm sales by foreign affiliates

Some figures on intra-firm trade by foreign-owned affiliates located in Sweden in the beginning of the 1960s have previously been presented by Johansson (1968). He found that out of a total of 67 foreign-owned companies that in the beginning of the 1960s carried out exports, 60 percent exported at least some products internally, while 10 percent exported to other companies in the same corporation exclusively, i.e were exporting only on an intra-firm basis. 40 percent were found to export only to external firms (Johansson 1968). Some differences appeared in the way the export was carried out to different geographical markets. Exports to the neighbouring Nordic countries were designed mainly for external firms, while exports to other EFTA countries and to EEC countries to a greater extent were conducted via intra-firm-trade.

The intra-firm export of domestic and foreign companies during the middle of the 1970s has also been estimated in a government study (SOU 1982:15). Here it was found that for all manufacturing companies in Sweden included in the study, intra-firm trade was responsible for one third of all exports. The foreign TNCs, in particular, were using intra-firm export increasingly as a way of marketing their products. In 1977, more than half of the foreign affiliates' exports from Sweden were of the intra-firm kind, compared to less than 40 percent of the Swedish TNCs exports. Looking at affiliates of corporations based in different countries, it was also found that especially West-German firms were using intra-firm exports from Sweden as a way of marketing products abroad, while American firms were shifting exports via external channels to intra-firm more rapidly than firms based in any other country in the 1975-79 period.

The most recent estimates that are available on intra-firm exports by foreign-owned companies located in Sweden (NUTEK 1992), show that, in 1989, 40 percent of total exports by foreign-owned companies with at least 20 employees, were performed on an intra-firm basis, see table 3.10. According to this study, foreign-owned companies were organizing export sales on an intra-firm basis, to a greater extent than most of domestic Swedish firms. Only in the 20 biggest and most internationalized Swedish TNCs the exports were organized on a intra-firm basis to a greater degree than among the foreign-owned companies. In a study by Andersson (1994), it is also shown that US-based firms seem to be internalizing export sales to a greater extent than affiliates based in other countries. In 1991 US based firms exported more than two thirds internally, while EC-, and EFTA-based affiliates internalized approximately one third of total exports, respectively.

Table 3.10 *Percent intra-firm exports of total exports, in different types of manufacturing companies located in Sweden in 1989.*

	STNC 20-group	Other STNC	foreign-owned TNCs	Other manufacturing companies	All industry
Percent intra-firm exports	55	34	40	23	42

STNC 20-group: Sweden's 20 most internationalized manufacturing companies in terms of employment
Other STNC: Swedish companies with at least 200 employees abroad, not included in the STNC 20-group
foreign-owned TNCs: Foreign majority-owned companies with at least 20 employees in Sweden
Other manufacturing companies: Total industry, except the above three categories of firms

Source: NUTEK (1992)

3.14 Imports by foreign affiliates

Some figures as to what extent foreign affiliates in Sweden import their intermediate input goods, alternatively, purchase these from domestic suppliers are available from some earlier surveys. Concerning the import-performance among the foreign-owned affiliates located in Sweden, it should firstly be noticed that no import-regulating policies are applied by the Swedish government in relation to foreign-owned TNCs. In a study by Johansson (1968), it was shown that 85 percent of a total of 132 foreign affiliates carried out any imports of raw materials and/or components in 1962. Although it was not possible in this study to estimate the total share of purchases of raw materials and components that were imported, it was suggested that the activity in many of the foreign-owned affiliates was dependent to a significant degree on raw material imports from the mother-company abroad or was characterized by assembly operations based on imported products from the mother company. It was thus hypothesized that foreign-owned affiliates were dependent to a greater extent than

comparable domestic companies on imported raw-materials and semi-finished inputs.

Looking at the import-performance in the late 1960s, Samuelsson (1977) found that 10.6 percent and 11.6 percent respectively of Sweden's total imports in 1965 and 1970 came from foreign-owned affiliates. The overall trade balance of the foreign affiliates was strongly negative in both 1965 and 1970.

In the early 1970s, the foreign TNCs' share of the total Swedish import was substantially higher than the share of exports, as they were responsible for almost 30 percent of the value of imports in 1973 (SOU 1975:50). The import-intensity, measured as the import share compared to the total sales of internal production, was found to be higher among foreign affiliates, compared to all domestic owned companies in 1978, or 30 percent for the foreign TNCs, while the Swedish TNCs had a share of almost 19 percent and domestic companies without foreign affiliates a share of 11 percent (SOU 1982:15). Part of an explanation for the higher import shares of the foreign TNCs can be found in the industry patterns of the foreign firms. These were to a substantial degree concentrated on the chemical industry, which is characterized by a high import-intensity. Not all of the differences in the import-intensity between foreign and domestic firms could, however, be attributed to industry patterns, as the foreign affiliates showed a higher import-intensity in all industries, at the ISIC 2 digit level.

3.15 Intra-firm purchases by foreign affiliates

Finally, the only estimate on the propensity to import intermediate products from parent-corporations by foreign affiliates in Sweden is provided by Johansson (1968), who estimated that 10 percent of the foreign-owned affiliates in Sweden, in the mid-1960s, had all their imports concentrated on the parent-company, while another 10 percent imported from both parent- and sister-companies. Most of the affiliates, 55 percent, imported from both parent- and sister companies, as well as from external firms, and 10 percent imported only from external firms.

3.16 Foreign manufacturing in Sweden: A summary.

The internationalization of the Swedish manufacturing industry has traditionally been focused on the large number of Swedish multinational companies, which, as early as the late 19th century, expanded their markets and production bases outside Sweden. A significant share of the Swedish manufacturing industry, and hence the economy as a whole, is also internationalized today through the location of foreign-owned companies in Sweden. These are becoming strategically important in areas such as production, employment, foreign trade and R&D. In 1993, 650 foreign-owned manufacturing companies were located in Sweden, covering 125 000 employees or 14 percent of the employment in the entire Swedish industry.

The foreign-owned companies are mainly active in the engineering-, chemical-, and food industries, while being especially dominant in the non-metallic mineral-, chemical-, and food industries. Together with the traditionally influential countries such as the US and the UK, companies especially from Switzerland and the neighbouring Nordic countries, are, these days making substantial investments in Swedish manufacturing. The foreign-owned companies are dominated by relatively large enterprises, located mainly in the metropolitan areas.

According to Table 3.11, the influence of foreign-owned companies on the Swedish manufacturing industry in 1993 seems to be somewhat more significant in terms of exports and employment, than for value-added, turnover, R&D and investments. Traditionally, the main motives for the establishment of foreign-owned manufacturing firms have been partly related to high goods-transfer costs, and partly to Sweden's competitive advantages in skilled worker-intensive production. More recently, strategically related motives, with the purpose of increasing market shares,

Table 3.11 *Foreign-owned affiliates' share of the Swedish manufacturing industry 1993. Percentages.*

	Share of the total Swedish manufacturing industry
Employment	19.0
Turnover	18.5
Value added	18.7
Exports	19.2
R&D	13.7
Investments	14.8

Source: *Statistiska Meddelanden*, Serie F 18, SM 9501, Foreign Owned Enterprises, 1994, Statistics Sweden, SCB.

seem to dominate the investments. Thus, the main vehicle of establishment has been the acquisition of domestic-owned companies, often of a horizontal or market-expanding type, where competitors or possible competitors are incorporated. Some indication is found of a growing international coordination between the affiliates located in Sweden and other parts of the international TNCs, i.e. an increasing intra-firm trade of finished- as well as semi-finished goods and components. The bulk of the production of the foreign-owned companies has traditionally been sold on the local market, but a growing share of the total sales is now being exported. The internationalization of the Swedish manufacturing industry, through the establishment of foreign-owned manufacturing companies, is also indicated by the relatively large importance these companies have as retailers of goods produced by parent- and sister-firms.

4 SOME BASIC CONCEPTS AND EARLIER EMPIRICAL INDICATIONS RELATED TO INTEGRATED INTERNATIONAL PRODUCTION

4.1 Introduction

In this chapter, a discussion will be presented, focused on earlier empirical findings and some basic concepts related to integrated international production. The discussion is intended to present empirical and conceptual references, making possible comparisons with the empirical findings of integrated international production among MOFAs located in Sweden. A number of different dimensions of integrated international production will be considered, each of which is related to the first, general, objective of the study (set out in section 1.2, above): "*to describe the extent of integrated international production, i.e. transactions between MOFAs located in Sweden and their parent- and sister-affiliates located outside Sweden*".

Firstly, section 4.2 focuses on the extent in which MOFAs are engaged in export activities, alternatively, only manufacture for the local host market, since this, at least implicitly, is based on a coordination of markets between different parts of a TNC. Thereafter, in section 4.3, the discussion of integrated international production relates to the extent in which MOFAs purchase material inputs from suppliers on the local Swedish market alternatively, import material inputs from suppliers abroad. In section 4.4 the discussion focuses on intra-firm sales and purchases, i.e. the internal sales to, and purchases from, parent- or sister-firms. In the following three sections, the tendency of TNCs and their affiliates to integrate other parts of their geographically dispersed value-chains is discussed. In Section 4.5 the growing tendency of TNCs to coordinate their geographically dispersed activities, rather than to operate a number of autonomously managed affiliates, will be considered. Section 4.6 discusses the growing importance of cooperation with external firms, e.g. suppliers and customers, in order to improve, or, develop new technology, and at the same time, disperse the technological competence between affiliates and parent-firms. Section 4.7 focuses on a relatively new phenomenon in some TNCs: that of MOFAs operating as competence centres on behalf of other parts of parent-corporations. The chapter ends with a summary of the discussion of integrated international production and, specifies a number of research questions which, empirically, will be analysed in the study.

4.2 MOFAs as exporters

The first indication of integrated international production is related to the extent in which foreign-located affiliates of TNCs are engaged in exports, since export activities by foreign located affiliates rest, at least implicitly, on a coordination of markets between various parts of the TNC. This market-coordination can be based on geographical considerations, e.g. different affiliates serve different markets, or, it can

be based on product specialisation, e.g. different affiliates produce different products. A combination of these types of coordination is also possible.

Traditionally, except for TNCs engaged in the extraction of raw materials and low-cost sourcing from developing countries, most production of TNC affiliates has been designed to serve the local market in the host country (Dunning 1993). During the 1970s, however, TNCs began to recognize the value of coordinating their regional or global production activities. The tendency of TNCs to rationalize and specialize their foreign-located affiliates has been especially dominant among US affiliates located in the European Community, partly motivated by an attempt to achieve economies of scale and specialisation and partly motivated by a desire for flexibility and a better access to technologies and markets (Levy and Dunning 1993).

Unfortunately, empirical evidence of the extent of affiliate exports is scare, given that only governments in the US regularly provide statistics related to TNCs and trade. Indications, based mainly on data from US firms, seem to suggest that, over time, since the mid-1960s, an increasing share of total world exports by TNCs is performed by their affiliates located abroad, while exports by the parent-corporation, at the home base, are stable or declining. By the mid-1980s, almost one half of all exports by US TNCs were estimated to be carried out by foreign affiliates (UNCTC 1988). Generally, the export propensity of foreign affiliates has also been rising over time, and, at the same time, appear to shift towards manufactured products including a higher proportion of technology-intensive products compared to host country exports taken as a whole (UN-TCMD 1992a). An important exception to the tendency of growing exports by affiliates seems, however, to be found among foreign manufacturing affiliates of Japanese TNCs, where the export-share in total sales decreased from 26 percent in 1980, to 23 percent in 1992 (UNCTD-DTCI 1995). The importance of foreign affiliates as exporters can also be illustrated by the fact that, in 1992, exports by foreign affiliates of United States and Japanes TNC taken together accounted for 8 percent of total manufactured exports from developing countries, and almost 10 percent of total manufactured exports from developed countries (UNCTD-DTCI 1995)

There is also considerable evidence to suggest that foreign affiliates have higher export propensities and tend to be more export-oriented, compared to domestic firms (OECD 1994). This is explained, partly, by the fact that TNCs are normally concentrated in trade-intensive sectors and, partly, because the trade-propensity of TNCs in any given sector seems to be higher than corresponding domestic firms (Dunning 1993). Theoretically, this rests on the assumption that foreign production cannot normally take place without some trade in intermediate products, e.g. management and technology, and that all or most of the value-added activities performed by TNCs are undertaken to divert or create trade in goods and services.

Empirical studies are frequently found to strongly support the view that TNCs and their affiliates, both in developed and developing countries, are involved in sectors with above average export intensities. Some of the latest of these studies are those

performed by the United Nations (UNCTC 1991, UN-TCMD 1992a), while previous surveys include a series of investigations on foreign affiliates in the UK (Dunning 1958, Dunning 1985, Steuer 1973), Portugal (Simoes 1985), Belgium (Van den Bulcke 1985), Germany (Juhl 1985), USA (Pugel 1985) Singapore (Lewcraw 1985), and Sweden (Swedenborg 1985). Also in India statistically significant positive relationships between foreign ownership and Indian export-performance has been identified (Katrak 1983, Lall and Mohammad 1983) .

However, not all surveys of export-performance by foreign-owned TNCs support the view that these firms are on average more involved in foreign trade than their domestic counterparts. Studies, especially on US-based TNCs in Canada (Safarian, 1966, 1969, Globerman 1985), and Australia (Brash 1966) have found no clear or consistent tendency towards higher export propensities among foreign compared to uninational firms, or, that TNCs tend to be more concentrated in trade-intensive sectors. A second group of studies which questions the view that TNCs are more trade intensive than uninational firms, focuses on foreign investments in a number of larger industrialized or mixed economies (e.g India, China and the former Soviet Union), employing a variety of policies of self-reliance. In these countries, the general motives behind foreign investments seem rather to be to eliminate, or reduce, foreign trade (i.e mainly imports) and to promote import-substituting production for domestic consumption (Lall 1985, Kumar 1990). Marginal impact on host country trading patterns by foreign TNCs has also been identified in Korea by Koo (1985).

Traditionally, connections between foreign production and trade have been analysed in a two-country framework consisting of a parent-company, headquartered in the home country, and affiliates located in a host country (Horst 1973). The basic assumption in this perspective has been that the production of foreign-located affiliates, is either sold on the local host market, or exported back to the home country. Based mainly on data on US export-intensive affiliates located in South East Asia during the 1970s, which were mainly assembling high-tech electronic products for re-exports to the USA, it has also been suggested that TNCs, by promoting a new international division of labour by taking advantages of inter-country differences in factor prices, reaping economies of scale, and gradually shifting production to low cost sites abroad, are eventually shaping a "world factory" (Fröbel, Heinrichs and Kreye 1980, Grunewald and Flamm 1985). One of the basic characteristics of this new division of labour should be an increase in the degree of exports of affiliates directed to the country of origin of their parent-corporations.

The fragmentary empirical evidence available on the geographical destinations of affiliates' exports does not, however, support the hypothesis that a growing degree of affiliates' exports are directed to the country of origin. Data for US TNCs in the middle of the 1980s indicates that, only in affiliates located in Asia and Canada, are most of the outputs directed to the USA, while affiliates in Latin America and Europe are mainly supplying the regional markets where the affiliates are located. (UNCTC 1988). Extensive surveys on Swedish TNCs and their foreign operations during the period 1960-86, (Swedenborg 1979; 1982; 1990, Swedenborg et.al 1988) show that

most of affiliates' production outside Sweden are sold on the local or regional markets of the affiliates, or exported to third countries, while only 2-5 percent of affiliates' total sales were directed to Sweden during the 1970s and 1980s. However, recent studies by Andersson and Fredriksson (1993) have identified a small increase, (to 8 percent) in affiliates' total sales directed to Sweden in the beginning of the 1990s, and at the same time a growing proportion of affiliates' total exports (25%) going to Sweden. Compared to foreign located affiliates of US and Japanese TNCs, the Swedish manufacturing affiliates are substantially more involved in exports to third countries. As a comparison it can be noticed that in the beginning of the 1990s US and Japanese affiliates shipped around 45 and 33 percent of total exports back to the home country (Encarnation 1993).

Generally, it seems that most export intensive affiliates are to be found in developed countries. For example, empirical findings of US-based manufacturing affiliates, in the 1977-1987 period, show a stable increase in the proportion of affiliates' exports, see table 4.1. This increase can be found among all US manufacturing affiliates and especially those located in the EC region, indicating a growing integration between affiliates and between affiliates and parent-corporations.

Table 4.1 *Percent exports of total sales of US MOFAs in manufacturing 1977-1987.*

	1977	1982	1987
EC-located affiliates	38.6	41.9	42.7
All affiliates	30.8	33.9	38.6

Source: Cantwell, J. (1992) The Effect of Integration on the Structure of Multinational Corporation Activity in the EC. In Klein, M.W. and Welfens, P.J. (eds.) *Multinationals in the New Europe and Global Trade*, pp 206-207

More recent findings on the export propensity of foreign located affiliates suggest that, in developed countries, the share of international sales in total sales of United States and Japanese affiliates has increased during recent years, as can be seen in Table 4.2.

Table 4.2 *Percent exports of total sales by US and Japanes affiliates by host area, 1982-1992*

	United States		Japan	
Host area	1982	1992	1982	1992
Developed countries	36.6	40.5	16.6	19.5
Developing countries	22.0	37.8	33.5	30.7
World	33.9	40.2	26.8	23.3

Source: UNCTD-DTCI 1995, p 210

Findings of foreign affiliates located in France and Finland show that around 30 percent of their total turnover in 1990 was exported (OECD 1994). As can be seen in Table 4.3, most export-oriented affiliates are found among those producing machinery and equipment. In Finland, export-oriented affiliates are also found in the paper, printing and publishing industry. Overall, the foreign affiliates located in Finland seem to be more export-oriented compared to those located in France, in most industries.

Some of the most comprehensive and in-depth studies on TNCs and their foreign operations, as well as effects on the home economy, have been carried out by Swedenborg (Swedenborg 1979; 1982; 1990, Swedenborg et.al 1988), recently continued by Andersson (1992), Andersson-Fredriksson (1993) and Andersson-Fredriksson-Leung (1993) in a number of studies on Swedish TNCs and their affiliates abroad during the period 1965-1990. (For a summary of these studies see Andersson et.al 1996). Based on unique, firm-level data, collected by the Industrial Institute for Economic and Social Research (IUI), covering virtually all Swedish TNCs in manufacturing with at least one foreign affiliate, some extensive studies on export-

Table 4.3 *Percent exports of total turnover of foreign affiliates located in France and Finland 1990.*

Sector		France	Finland
Food		-	8
Textiles		29	33
Wood, furniture		14	32
Paper, printing, publishing		18	48
Chemicals, petroleum		29	28
Stone, clay, glass		19	7
Basic metals		32	37
Machinery, equipment		36	43
of which	Computers	45	-
	Electric-electronics	37	-
	Motor vehicles	30	46
Other manufacturing industries		30	35
TOTAL		28	32

Source: OECD (1994), *The Performance of Foreign Affiliates in OECD Countries,* p. 81

performance of Swedish TNCs and their foreign affiliates in different parts of the world have been possible. One of the most interesting findings of these studies is that the average export-propensity in all manufacturing affiliates of Swedish TNCs has increased from 16 percent of total sales in 1970 to 31 percent in 1990. Table 4.4 shows the export share of total sales of foreign affiliates of Swedish TNCs located in different regions and industries in 1990. Export-orientated affiliates are mainly found in developed countries, especially those located in the EC-6, exporting almost half of total sales in 1990, while affiliates located in developing countries and North America

Table 4.4 *Share of exports of total sales in foreign manufacturing affiliates of Swedish TNCs located in different regions industries 1990. Percent.*

	Exports/Total sales
Affiliates located in different regions	
Developed countries	32
EC 12	39
EC 6	47
EFTA	33
North America	13
Other	7
Developing Countries	9
Affiliates operating in different industries:	
Basic	38
Pulp and paper	39
Iron and steel	28
Chemicals	16
Engineering	32
Metal products	23
Machinery	40
Electronics	19
Transport	56
Other	22
Total	31

Note: EC 6; Belgium, France, Germany, Italy, Luxembourg and Netherlands

Source: Andersson et al. 1996, p 61 and p.64

are less export-orientated, with 10 percent exports in total sales in 1990. The studies of foreign manufacturing affiliates of Swedish TNCs also show variations in exports between different industries. As can be seen, in the basic industries, affiliates operating in the pulp and paper and iron and steel industries exported 39 percent and 28 percent of total sales, respectively, in 1990. In the engineering industries, a substantial degree of variations in exports by the affiliates could be identified. For example, highest shares of exports in total sales was found among affiliates in the transport industry, with 56 percent and in the machinery industry with 40 percent of total sales. Substantially smaller shares of exports can be found in the electronics and metal products industries, where affiliates exported around 20 percent of total sales. Notice also that, beside variations in terms of export intensity among affiliates located in different regions and industries, not all affiliates performed any exports in 1990, since 26 percent were exclusively host-market oriented.

These surveys of Swedish TNCs and their foreign affiliates' propensities to export have refuted ideas of a simple relationship between more international operations by multinational firms and expanding trade between host countries. The affiliates' export

patterns seem mainly to be dependent on the kind of integration, vertical or horizontal, adapted by firms. However, difficulties in identifying various forms of organization among the sample firms have restricted the formal testing of this hypothesis. Of the firm-variables used to estimate the determinants of affiliates' export-performance, a high export propensity was found to be associated with production in few countries, low R&D intensity in the parent-company and the absence of input goods that are specific to the home country. Furthermore, high propensities were also associated with large and young affiliates, while the country-variables most associated with high export propensities included small host markets, high income and EC location. In sum, although empirical studies on the extent to which foreign located affiliates of TNCs are engaged in export activities is still relatively fragmentary, existing findings suggest that this is increasing in many countries, resulting in that, gradually, TNCs have developed into complex networks where affiliates' production is increasingly exported to third countries (UNCTAD-DTCI 1993).

4.3. Purchases of material inputs by MOFAs

The purchasing of raw materials, parts, components and other types of material inputs used by the affiliates in their production process cannot, in it self, be used as an indicator of integrated international production, since a substantial degree of material inputs can be imported by the affiliates on considerations other than those that are related to integration with parent-or sister-affiliates abroad. For example, the affiliate may, autonomously, decide to import material inputs on considerations related to availability, quality and price of material inputs found in the host market. However, since the extent to which affiliates material inputs are imported may be closely related to parent-firms' sourcing strategies and the extent of vertical integration through intra-firm purchasing of material inputs from parent- and sister-affiliates, some comments on TNCs and imports of material inputs are given as a second aspect of international integrated production.

Generally, it is suggested that the extent in which an affiliate uses imported intermediate products tends to be both product- and country specific, as well as influenced by firm specific factors, e.g. the sourcing strategy used by individual TNCs, and the age and experience of the individual affiliates (Dunning 1993). For example, young affiliates, established as market seeking organizations tend, at least initially, to undertake relatively simple finishing operations and import most of their inputs. Japanese TNCs have often been criticized for having very low local contents in their outputs, produced by "screwdriver" affiliates in Europe and the US. However, when these affiliates, where possible, increase their technological and productive capacity, and if indigenous suppliers are competitive in terms of price- and quality, the local-content-ratio is likely to increase, and the affiliates may be fully integrated into the

national production system, producing or buying more of their intermediate products, including R&D and professional services, from domestic suppliers. This is often found in empirical studies, at least on foreign affiliates operating in larger developed economies, e.g. Japanese manufacturing affiliates in Europe, which, in 1988 imported 37 percent of the value of their components, compared to more than 50 percent foreign procurement at the start of their European operations in the 1970s and early 1980s (Dunning 1993, UN-TCMD 1992a).

In developing countries, however, especially where governments promote the erection of various export-platforms, foreign affiliates are often characterized by labour-intensive assembly operations of high technology products, which most likely are imported from their parent-corporations. In these cases, as with natural resource-based investments, the local sourcing ratio is often marginal, even a substantial time after the establishment of the affiliates (Dunning 1993).

Surveys of foreign-, and domestic-owned firms' propensity to import, are even less frequent than investigations on export propensities. The few recent studies undertaken (e.g Lipsey 1991, Wyckoff 1993, Cantwell and Dunning 1991), seem to suggest that foreign-owned firms tend to record a higher import propensity than indigenous firms. One of the earliest and most comprehensive studies on procurements by market seeking TNCs was conducted by Lall (1980) who, on behalf of the United Nations investigated the sourcing strategies in the automobile industries in India, Peru and Morocco. The results of these studies showed an substantial increase, over time, in the local content of the sales in TNCs, at least those located in India. A recent study by Kumar (1990), on almost 50 Indian industries at the beginning of the 1980s, found no significant difference between indigenous and foreign-owned affiliates in their propensity to import intermediate products, although these affiliates were substantially integrated with parent-corporations. A number of other studies, e.g on the auto industry in Nigeria (Landi 1986), and on import propensities among foreign affiliates in Ireland (McAleese and McDonald 1978) and South Korea (Jo 1980) have identified a comparatively higher propensity to import intermediate products among foreign affiliates, relative to their domestic counterparts, and that these affiliates to a substantial degree were integrated into their parent-corporations. Significant differences between these studies were also found in the degree of import propensities among firms, according to which industries the affiliates were operating in, as well as the firms' age, size and experience of operating in the host country.

Analyses of factors determining the extent in which foreign affiliates are engaged in local subcontracting are provided e.g. by Halbach (1989) in a study on more than 100 affiliates operating in a number of developing countries. The factors in that study, which were found to contribute most significantly to differences in the amount of subcontracting undertaken depended mainly on the level of domestic technology and the skill of local labour force, and, secondly, on the procurement strategies of the host governments. Significant variations in terms of subcontracting activities were, furthermore, found according to industry characteristics and the affiliates' experience

in operating in the host country. Larger affiliates tended, generally, to be more vertically integrated into their parent-corporations than smaller affiliates. Government-policies affecting the proportion of local sourcing is often found in Latin America, as shown in a case-study by Alvstam and Ellegård (1990) on procurement-policies in the automotive industry in Brazil.

Summarizing the major empirical findings on backward vertical linkages established by market-seeking foreign affiliates in developing countries, Dunning (1993) concludes that TNCs affiliates have established few linkages in small or industrially backward economies, mainly because of an insufficient subcontracting infrastructure in these countries. The percentages of local subcontracting also seem to be correlated to the length of time the affiliates have been operating. In the larger and more advanced developing economies, TNC affiliates have often forged substantial linkages, but only as a result of government import restrictions and the imposition of local performance requirements.

Another category of surveys on sourcing policies among TNCs concentrate on those affiliates operating in export-orientated industries. Here, the key variables influencing the propensity to import or source locally seem to be related to three sets of factors; the types of products that are supplied, the quality of local supporting industries and government policy. Poor indigenous supplier infrastructure may contribute to minor local linkages and purchases by foreign affiliates, as indicated in studies by Evans (1979) on Latin American textiles and clothing industries, and Lim and Pang (1982) on consumer electronic industries in Malaysia and Singapore. On the other hand, if domestic suppliers are competitive, encouraged by the foreign affiliates to upgrade their operations, and can meet quality and price requirements from foreign affiliates, domestic purchases may in time, increase, as indicated in surveys by UNCTAD (1975) and Lim and Pang (1982, 1991) on the electronic industry in South East Asia.

In summary, the extent to which foreign affiliates behave differently from indigenous firms in their procurement decisions seems to be mainly for one of two reasons. Firstly, it may be that the foreign affiliates, or their parent-corporation, have better information about worldwide prices and qualities of various inputs, and that they are able to acquire these on more favourable terms. The second situation where foreign affiliates may exhibit substantially different procurement patterns, is when the parent-corporation chooses to operate with distinct procurement strategies, forcing the affiliates to coordinate their purchases in line with corporate directives (Dunning 1993).

The implication of marginal local linkage-formation by externally owned firms is an interesting phenomenon, which has generated a substantial number of studies. According to much of the so called "branch-plant" literature (for reviews, see: Watts 1981, Phelps 1992; Ashcroft and Love 1993; Malmberg 1990) external ownership is generally believed to have a negative effect on local business linkages, due to restricted local decision-making, which, in combination with a specialization of only

low-value added activities in the branch plants, tends to foster only minor forward and backward business linkages into the local economy.

Recently, Dicken et.al. (1994) have suggested that the extent of local embeddedness of TNCs can be analysed according to the coordination and configuration aspects facing TNCs identified by Porter (1986). The first of these aspects relates to the geographical configuration of individual units within the TNC, i.e to the specific type of operation performed by the affiliate, e.g. the position within the internal production chain, external business networks, and the kinds of functions it performs. The second, and most important determining factor, is the way in which the TNC tries to coordinate its operations, including the purchasing function.

Also, in the "flexible specialisation" or "post-Fordism" literature (e.g. Piore and Sabel 1984, Storper and Walker 1989, Schoenberger 1991, Amin 1994), concerned with what is perceived as new forms of industrial organisation, the connection between local decision-making in supplier-relations and local linkages is of importance. According to Turok (1993), two distinctive linkage-scenarios emerge from this wide-ranging literature: "the developmental" and "the dependent". In both scenarios, major corporations are seen to be more responsive to fluctuating global economic conditions and increasing market diversity, reflected in the need to improve product quality and price competitiveness through accelerated product development and production cycles.

In the "development" scenario, vertical disintegration of large corporations and decentralization of decision-making, facilitating a greater flexibility in production, are associated with different forms of collaborative and interdependent arrangements between TNCs and local firms. In order to minimize transport and transaction costs, these arrangements tend to generate geographical clustering and self-sustained growth. This is based on substantial local sourcing and the transfer of technology and expertise to local suppliers, who may become specialist suppliers with a capacity to develop new products and know-how for domestic and foreign markets.

In the "dependent" scenario, on the other hand, linkages to local suppliers may also be substantial, although mainly hierarchical, governed by price considerations and other short-term objectives, rather than by a desire to establish long-term collaborative technology-generating arrangements. Thus, local clusters become weak nodes within a wider network of powerful TNCs, where local suppliers may become economically and technologically dependent, supplying the TNC with standard components produced by basic technology and work processes. In the "dependent scenario", local linkages do not imply improved regional development prospects or stronger local industrial capacity. Rather, linkages may be short-lived or restricted in scope through weakly embedded inward investors.

4.4. Intra-firm trade and TNCs

4.4.1 The extent of intra-firm trade.

One of the most significant indications of integrated international production among TNCs is the existence of intra-firm trade, i.e. trade in goods and service between different units of the same legal corporation. In order to discuss the significance of intra-firm trade, constituting the third broad indicator of integrated production in the present study, we can, following Casson et al. (1986) and Casson and Pearce (1988), define a transnational (or multinational) enterprise as one which owns and controls value-adding activities in two or more countries. These, more or less geographically separated activities, are typically linked by flows of different goods and services, which, if they are used, transformed or incorporated into some other product in the course of the production process, can be identified as intermediate products. We can, furthermore, distinguish between final and finished products, where finished products are those that have completed production and are ready for wholesale and retail distribution. Final products, on the other hand, are those products that are supplied to households or individuals, ready for consumption. Thus, in this perspective finished products are usually intermediate- rather than final products.

Intermediate, and to a lesser degree, also final products, enter into international trade. This is done once the products cross any juridical border of individual countries. When an intermediate product is traded, it does not necessary have to change ownership. If an intermediate product is traded between two different divisions of the same ownership unit, e.g between two affiliates of a TNC, the market for this transaction can be said to be internalized, and, if the two units of the same legal entity are located in different countries, giving rise to intra-firm trade. If, on the other hand, the traded intermediate product does change ownership, the market is said to be external, and the transaction, if it crosses national boundaries, identified as arm's-length trade.

In order to distinguish between different types of products, which are most likely to enter into intra-firm trade, we can, according to Casson and Pearce (1988) identify five major categories. Firstly, foodstuff and raw materials, grown or extracted by a TNC, and exported for further processing abroad. The second category consist of components and semi-processed materials, exported from one manufacturing facility to another. A third type consists of finished goods ready for marketing and distribution by a foreign sales affiliate. In addition to these three categories of manufactured products, we can also identify a fourth category, consisting of second-hand capital equipment, transferred for use in an overseas plant. The final category of products most likely to enter into intra-firm trade, consists of services of intangible assets, e.g. technical know-how, proprietary product design and managerial expertise.

Data on the extent to which TNCs tend to internalize their sales and purchasing markets is only published regularly in very few countries. The only systematically collected and published data on international trade flows related to TNCs, are those

by the United States Department of Commerce. Hence, most empirical surveys on intra-firm trade are on US firms, while studies of intra-firm trade involving TNCs from other countries are mostly based on irregularly published case studies.

Some of the earliest surveys on intra-firm trade are those of Brash (1966) who estimated that as much as 90 percent of imports by US affiliates in Australia in the early 1960s were internalized. Another early survey on intra-firm trade is provided by Safarian (1966), who, in a study of 266 TNC affiliates in Canada in the middle of 1960s, found that the average export internalization ratio was almost 51 percent and the corresponding average import internalization ratio, 72 percent. A much lower propensity to internalize foreign trade was found by Forsyth (1972) on US affiliates in Scotland in the late 1960s, (21% and 57% respectively for exports and imports), and by Dunning (1977) on some 30 large UK TNCs operating in less developed countries in the late 1960s (25% and 45% respectively for exports and imports). Estimates on intra-firm trade among Swedish TNCs in the middle of the 1970s (Helleiner 1981), found that 29 percent of exports and 25 percent of imports were between the Swedish TNCs and their foreign affiliates, while corresponding figures for Belgian firms in 1976 were 53 percent and 48 percent respectively (Van den Bulcke 1985).

Some major results from more recent studies of intra-firm trade show that in 1982 almost 70 percent of EC-based exports to other EC countries by US manufacturing affiliates were to other affiliates in the parent-corporation (US Department of Commerce 1985). Encarnation (1993) found in a study that more than two thirds of the exports from Japan to the US, and about half of the imports into Japan from the US are within Japanese or US TNCs. In 1984 almost 30 percent of the UK manufacturing exports and half of imports were between UK TNCs and their foreign affiliates (British Business 1985). Corresponding figures for Japanese firms in 1983 were 30 percent and 18 percent respectively and for Portuguese TNCs in 1981, 31 percent and 34 percent respectively (Simoes 1985). In 1988 some 51 percent of exports by Japanese manufacturing affiliates were to their parent-companies or sister-affiliates, while some 42 percent of US exports, and 49 percent of imports of goods and services were between US firms and their foreign affiliates or parents (US Department of Commerce 1991).

The most recent attempt to estimate the share of intra-firm trade in total world trade is mainly based on information provided by TNCs from France, Germany, Italy, Japan and the United States, suggesting that, in 1993, around one third of total world trade in goods and services, is transacted on an intra-firm basis (UNCTD-DTCI 1995). Judging from data for Japan, Sweden and the United States, the absolute size of this intra-TNC market has more than doubled during the past decade (ibid). Generally, it is also suggested that, at least since the 1960s, the proportion of world trade that are intra-firm has been increasing. Estimates of US affiliates during the period 1977-1987 show a stable increase in the proportion of total sales that are based on intra-firm exports (Cantwell 1992). In 1987 some 28 percent of all US manufacturing affiliates' sales were exported on an intra-firm basis, an increase from almost 20 percent in 1977.

US affiliates located in the EC region show slightly higher shares of intra-firm sales than affiliates located elsewhere, at least in 1977 and 1982, which are the only years where figures are available.

As regards the amount of exports that are internalized among US TNCs, this seems also to have increased over the years. In table 4.5 it can be found that during the period between the mid 1960s to mid 1980s, the share of intra-firm exports in total exports by US manufacturing affiliates has increased from around two thirds to three quarters. Most of this increase was based on affiliates' intra-firm exports going to third countries. More recent estimates, including manufacturing as well as non-manufacturing affiliates of United States TNCs, show that the share of intra-firm exports in total exports increased from 52 percent in 1982 to almost 64 percent in 1992 (UNCTD-DTCI 1995)

Table 4.5 *Intra-firm exports of total exports by US MOFAs in manufacturing, 1966-1987*

	1966	1970	1977	1982	1987
Total	61	64	65	66	73
To third countries	52	54	58	58	66
To the US	84	87	81	86	88

Source: Cantwell, J. (1992) The Effects of Integration on the Structure of Multinational Corporation Activity in the EC. In Klein, M.W. and Welfens, P.J. (eds.), *Multinationals in the New Europe and Global Trade*, Springer -Verlag. Berlin and New York, p.206

Intra-firm trade among Swedish TNCs has been analysed in a number of detailed studies (e.g. Swedenborg 1979, Swedenborg 1982, Swedenborg 1990, Andersson 1992, Andersson et.al 1993, Andersson et al 1996), covering the period 1965-1990. As in many other industrialized countries, intra-firm transactions have become increasingly important in Swedish TNCs' foreign trade also. Including deliveries to foreign sales affiliates, the share of intra-firm exports from Swedish parent-companies as shares of total exports, increased from one third in 1970 to over 50 percent in 1990. Most of this was exported to sales affiliates abroad, but manufacturing affiliates has been the destination for a growing share, corresponding to about 20 of total parent exports in 1990 (Andersson et al. 1996).

Table 4.6 shows the share of total exports by Swedish TNCs to different regions that are directed to their producing affiliates in 1990. Swedish TNCs use intra-firm exports, especially to their affiliates in the original EC member countries, (EC6), "Other developed countries" (Japan, Australia and New Zealand) and Latin America, while exports to EFTA, Asia and Africa mainly are arm's-length (Andersson 1992).

If we turn to intra-firm sales by all foreign manufacturing affiliates of Swedish TNCs this has been estimated to 18 and 17 percent of total exports in 1986 and 1990, respectively (UNCTD-DTCI 1995).

Table 4.6 *Exports to producing affiliates, of total exports by Swedish TNCs to different regions 1990.*

EC6	EC3	EC-South	EFTA	N. Am	Other DC	Lat. Am	Africa+Asia
46.0	23.2	27.0	5.1	17.2	31.4	40.7	6.3

EC6 = Belgium, France, Germany, Italy, Luxembourg and Netherlands; EC3 = Denmark, UK, Ireland, *EC-South* = Spain, Portugal, Greece, Other DC = Japan, Australia, New Zealand.

Source: Andersson (1992), p 11.

According to Casson and Pearce (1990), the reasons for the growth in intra-firm trade, which has been witnessed during the last decades, can be related mainly to two different sets of factors. Firstly, the global production system has become increasingly internationalized, including changes in the international division of labour and a growing role of tradeable goods in the world economy. A tendency of continued fragmentation of the production process, creates an increasing number of intermediate products circulating between different stages in the production process before entering into the final output. We have also witnessed a significant growth in world trade, facilitated mainly by trade liberalization among developed countries combined with shrinking inter- and intra-continental transport costs, especially those related to bulky intermediate products.

Secondly, changes in the pattern of international comparative advantages has also tended to favour intermediate-product trade more than final product, especially from a number of newly industrialized countries where relatively standardized products are mainly produced by unskilled or semi-skilled labour and exported to developed countries. To these aspects of intra-firm promoting trends, we can also add the changing composition in world trade in favour of those sectors where internalized markets seem to be most dominant, i.e. manufactured output and services, at the expense of trade in primary products where the levels of intra-firm trade are comparatively lower.

However, although the absolute size of the global intra-firm market seems to have increased constantly up to the beginning of the 1990s, recent findings on the proportion of world trade that is internal to the TNC, show that this, in fact, is constant or even diminishing in the mid 1990s compared to earlier decades (UNCTD-DTCI 1995). One of the reasons for this can be related to the tendency of many firms, especially larger TNCs, to outsource parts of their operations, resulting in that a growing share of materials and components are purchased from independent firms, rather than being produced in-house (Wyckoff 1993). At the same time, an increasing degree of materials, parts and components in many countries is imported, resulting in the fact that the international trade in manufactured products in total has grown faster than that of intra-firm trade.

4.4.2 Some determinants explaining intra-firm trade

Part of an explanation for the growth of intra-firm trade is likely to be attributable to the failure of cross-border markets to operate efficiently. Most of the theoretical and empirical work on intra-firm trade has tended to concentrate on this aspect, giving rise to the internalization theory, a special branch of the modern institutional theory of the firm (Buckley and Casson 1976, Casson 1979, Williamson 1975, 1985). Several authors, the most influential being Casson et al. (1986), Casson and Pearce (1988), Dunning (1988b) and Gray (1993), have presented conceptual frameworks for analysing the factors determining the internalization of cross-border markets. In the most general terms, it is asserted that, the propensity to engage in intra-firm trade differs in accordance to industry-, country-, and firm specific characteristics, as well as to the strategic action or reaction taken by individual managers in the TNCs or their affiliates. An often quoted series of factors, affecting the propensity to internalize intermediate product trade, are those presented by Casson et al. (1986), see table 4.7.

Table 4.7 *Factors affecting the propensity to internalize intermediate product trade*

Factors	Positive or negative effect
Technical	
High fixed costs	+
Large non-recoverable investments	+
Use of continuous flow technology	+
Perishable intermediate product	+
Quality variability, coupled with a natural asymmetry of informations	+
Flexible use of working capital	+
Inventories widely distributed over space	+
Efficient scales at adjacent stages of production vary and their lowest common multiple is large	-
Multiplicity of joint inputs and joint outputs	-
Economies of scope in the utilization of individual assets	-
Market Power	
Monopolist faces downstream substitution, or monopsonist faces upstream substitution	+
Multi-stage monopoly or monopsony	+
Entry-deterrence by dominant firm	+
Dynamic	
Novelty of the division of labour	+
Fiscal	
Incentives for transfer pricing: differential rates of profit taxation, *ad valorem* tariffs, or exchange controls	+
Statutory invention in intermediate product markets, e.g. price regulation	+
Restrictions on foreign equity participation, local value added requirements, and the expropriation risk of foreign direct investment	-

Source: Casson et al.1986, p. 12

The gains from intra-firm trade can be derived from the greater efficiency of hierarchical flexibility of policy and of intra-firm communications, and savings in transaction costs; creating economies of common governance, or internalization economies, which enhance the potential for trade among units of a TNC located in different countries to a greater degree than could be achieved among independent firms. Williamson (1979) identifies a number of conditions which contribute to economies of common governance (internalization efficiency gains). Firstly, we have those conditions which offer hierarchical efficiencies by reducing costs of production relative to those which can be achieved through arm's-length contracts. These efficiency gains are mostly prevalent, given the existence of large, and recurrent volumes of trade between corporate units and/or where there exists uncertainties with respect to price, quality and design of traded products. Economies of common governance through vertical integration also arise where tight standards are imposed by the purchaser in relation to the suppliers, by reducing negotiation-, and quality control costs. Internalization efficiency gains are also significant when the parent-firm owns some product-specific know-how that is more efficiently transferred internally to producing affiliates abroad, rather than through licensing or selling this to external firms.

Another aspect that is often neglected when analysing international trade and TNCs is the concept of linkages between different constituent economic units and the efficiency-reducing role of imperfect knowledge and linkages, developed by Törnqvist (1977). By using their better internal communication networks, TNCs can improve the potential gains from trade, by making more efficient use of production and marketing resources.

Empirical studies of the determinants of intra-firm trade are fragmentary, mainly because of the difficulties in collecting usable data. Those that do exist show, however, significant industry-, country- and firm-specific variations in the propensity to internalize cross-border trade. Substantial differences in internalizing foreign trade among firms operating in different industries, have been identified in a number of surveys, e.g by Dunning and Pearce (1985), who, in a broad survey of 172 of the worlds largest TNCs in the beginning of the 1980s, found that, on average, around 34 percent of exports were of the intra-firm kind. Significant variations between industries were also found, ranging between 72 percent for office equipment and computers, and 60 percent in the auto industry, to 8 percent in the paper and wood industries and less than 2 percent in the textiles industry. Generally, it was found that the propensity to engage in intra-firm trade was highest among US motor vehicle firms and lowest in Japanese manufacturing multinationals. Another example of industry-specific differences in intra-firm trade can be exemplified by a study by Casson and Pearce (1988), who found that the propensity among US affiliates in 1982 to use intra-firm exports, varied from 85 percent in the transport equipment-, to 38 percent in the non-electric machinery industry, with an average propensity of 66 percent in the total manufacturing sector.

Generally, intra-firm trade seems to be highest in high-technology sectors and in

those producing complex manufactures, especially if they normally require after-sale services, e.g. automobiles and consumer electronics, while relatively lower in low-tech, resource-based industries, such as metals and wood products industries, although a substantial part of world trade in raw materials, especially exports from developing countries, takes place on an intra-firm basis (UNCTC 1988). Many studies analysing industry specific determinants on intra-firm trade (e.g. Buckley and Casson 1976, Lall 1980, Pearce 1982) have also found strong relationships towards high propensities of intra-firm trade and high R&D expenditures. This can be explained by the fact that, in high-tech industries with novel products, there are substantial uncertainties regarding product quality, quantity and price, which encourages firms to produce the most sophisticated components itself and supply them only to wholly-owned affiliates overseas. Among the most recent studies, stressing the importance of high technological intensities, or R&D expenditures, in industries most likely to engage in intra-firm trade, are those of Sleuwaegen (1985), Cho (1988), and Siddhartan and Kumar (1990). Other important variables, which have significantly contributed towards explaining intra-firm trade in these surveys, has included the amount of selling- and marketing expenditures and the presence of scale economies.

In surveys analysing the regional- or country specific factors influencing intra-firm trade special attention is often paid to different forms of regional economic integration, e.g. an increase in intra-firm trade among TNCs operating inside the EC region (US Department of Commerce 1985, Cantwell 1994a). Important country- or regional specific variables influencing intra-firm trade seem also to be related to the extent in which countries or regions are involved in the international division of labour, and to the extent that governments are pursuing different kinds of trade policies, i.e influencing trade structures and -levels through tariff/non tariff trade barriers, local content- and sourcing requirements (Helleiner and Lavergne 1979).

Firm-specific variables influencing the degree of trade, organized through intra-firm transactions, normally include the extent of multinationality, size, product structure, age and experience of foreign operations. For example, Japanese companies are often found to exhibit relatively high shares of intra-firm trade, due to firm-specific variables such as international experiences, procurement policies and interaction within the unique trading companies; the Sogo-Shoshas. Studies indicating a higher propensity to internalize foreign trade among Japanese companies, compared to corresponding non-Japanese firms, include those of Dunning (1986) on the operations of Japanese TNCs in the UK in the beginning of the 1980s, Lewcraw (1983) in a study on 111 light manufacturing TNCs in five Asian countries, and Encarnation (1993) in a study of US and Japanese firms' trade between Japan and the US.

Another example of firm-specific variables, affecting the extent of intra-firm trade, is illustrated by Dunning and Pearce (1985), who showed that in a sample of the world's largest TNCs in the early 1980s, the highest propensities to engage in intra-firm exports were found in TNCs operating strategies of cross-border product or process specialization. This tendency of a high degree of intra-firm trade among TNCs

engaged in cross-border product and process specialisation, is also indicated in more recent studies on US manufacturing affiliates located in EC countries, which, in 1989, internalized some 60 percent of exports to non US-destinations (US Department of Commerce 1991).

Much of the benefits to be gained from product or process specialisation can be related to economies of scale. The importance of scale economies, influencing intra-firm trade, is stressed e.g. by Helleiner (1981), who, in a survey of US affiliates postulated that intra-firm trade is most likely to be found in manufacturing industries which are characterized by entry barriers, such as scale economies, and product differentiation. The result of this study also showed that size had a significant positive effect on the propensity to internalize trade, although the variable used for measuring size was related to plant size, rather than firm size.

As was briefly discussed above, most theoretical discussions which try to explain the existence of intra-firm trade (e.g. Williamson 1971, 1979; Lall 1978), seem to focus on the economic gains to be received through vertical integration, where different units of a TNC are linked together through flows of materials, components, parts and other intermediate input goods in the course of the production process. However, recently it is suggested that a more complex set of relationships are likely to govern the internal transfer of goods and services among TNC-units, at least those located in developed countries. For example, Cho (1990) concluded in a study of US TNCs that vertical integration in terms of deliveries of intermediate products do not necessarily have a significant impact on the propensity of intra-firm transactions; while studies by Lall (1978) and Zejan (1989) suggest that intra-firm trade is positively related to the need for after-sale services, which are likely to be more related to horizontal integration, rather than with vertical integration. One of the reasons why intra-firm trade and vertical integration are traditionally found to be closely associated, is probably due to the fact that in most studies on intra-firm trade it is not possible, mainly because a lack of detailed data, to distinguish intermediate products, which are used as input goods in the production process, from those that are finished and ready for wholesale or retail distribution. Hence, intra-firm trade is usually considered to only consist of intermediate products in terms of input goods (cf. Lall 1978, Helleiner 1979, Pearce 1982, Zejan 1988;1989, Cho 1990).

Today, however, most of FDI between developed countries is motivated by market proximity considerations, taking the form of horizontal expansion (Markusen 1994; Brainard 1994), where intra-firm exports to a substantial degree take the form of finished products aimed at external customers, as clearly demonstrated by detailed studies of intra-firm exports from Swedish parent-TNCs to their foreign located manufacturing affiliates (Andersson et.al 1996). As suggested by several researchers (Lall 1978, Casson et al 1986, Gray 1993), intra-firm trade of intermediate inputs and finished products is likely to be internalized for partly different reasons. Intra-firm trade of intermediate products for usage in the production process should be associated with economies of scale and specialization at the plant level and the exploitation of country differences in factor endowments. Intra-firm trade of finished

products, on the other hand, should be more associated with horizontally integrated TNCs, operating a number of foreign located affiliates, producing similar products in different countries in combination with imports of complementary products from sister affiliates, in order to provide customers with a broad range of products.

Recently, this has also been supported empirically in detailed surveys of intra-firm trade in Swedish TNCs (Andersson et al 1993, Andersson and Fredriksson 1994, Andersson et al 1996). Based on detailed data of Swedish parent-firms and their foreign affiliates between 1974 and 1990, these studies are some of the few attempts that have been made to systematically analyse intra-firm trade, distinguishing between intermediate products that are used as material inputs in the production process and finished products for resale. The studies of intra-firm trade in Swedish TNCs show that internalization of the two categories of products is determined by different factors. Significant differences between affiliates with regard to the composition of supplies from parent-firms were found, even between affiliates belonging to the same corporation. Differences in the propensity of affiliates to import intermediate and finished products were found to be related to firms' organization of international production, and to specific characteristics of individual host countries and affiliates. The findings from these studies suggest that the presence of economies of scale at the plant level as well as production in a relatively concentrated number of countries, positively contribute to exports by affiliates. Furthermore, while intra-firm imports of intermediate input goods are increasing in the export intensity of affiliates, the reverse is true in the case of finished goods. In other words, affiliates that primarily sell their output locally, report relatively large intra-firm imports of goods for resale, which is in line with what can be expected for horizontally integrated affiliates. These results support the assumption that vertical integration is associated with intra-firm trade in intermediate products (inputs), and that horizontal expansion leads to less trade on the whole, but may enhance complementary supplies of finished goods.

A number of other interesting findings are also provided in these studies. For example it can be found that the propensity to use intra-firm exports in relation to total exports from Swedish parent-firms to their foreign located affiliates, increased during the 1970-1990 period from one third to over 50 percent, including deliveries to sales affiliates. At the same time, the average propensity of manufacturing affiliates to import finished and intermediate input goods from parents has fallen from 17 percent of total sales in 1974 to 11 percent in 1990.

Focusing on intermediate inputs only, as can be seen in Table 4.8, imports of intermediate products from parent-firms, represent 8 percent of affiliates' total sales. At the same time, great variations between affiliates located in different countries in the extent of imports from parent-firms can be found. For example, the share of imports of intermediate products from parent-firms, in relation to total sales, is almost 10 percent in affiliates located in EC countries, compared to less than 5 percent in affiliates located in EFTA countries and North America. In this Table we also find that affiliates operating in the transport industry are especially dependent on intermediate products

Table 4.8 *Share of imports of intermediate products from parent-firms in relation to total sales, in foreign manufacturing affiliates of Swedish TNCs located in different regions and industries 1990. Percent.*

	Imports of intermediate inputs/total sales
Affiliates located in different regions	
Developed countries	8
EC 12	9
EC 6	9
EFTA	3
North America	4
Other	13
Developing Countries	9
Affiliates operating in different industries:	
Basic	4
Pulp and paper	3
Iron and steel	10
Chemicals	6
Engineering	11
Metal products	4
Machinery	2
Electronics	7
Transport	28
Other	2
Total	8

Note: EC 6; Belgium, France, Germany, Italy, Luxembourg and Netherlands

Source: Andersson et al. 1996, p 60 and p.64

delivered from parent-firms, with imports amounting to almost 30 percent of total sales, while marginal shares of intermediate imports can be seen among affiliates in the iron and steel, pulp and paper, metal products and machinery industries.

The trend towards a decrease in manufacturing affiliates', importing from parent-companies in Sweden, which has been identified during the 1970-1990 period, is partly determined by the expansion of many Swedish TNCs, especially during the 1980s, by means of the acquisition of existing firms, which substantially seem to be less dependent on supplies from parent-firms. In 1990, 47 percent of all affiliates that had been incorporated through take-overs had no imports from parent-companies, compared to 19 percent in affiliates established through green-field investments. Looking at the affiliates' imports from their parent-corporations in Sweden, it was found that in all affiliates, intra-firm imports of intermediate inputs and finished products, as a share of total sales, increased from 11 percent in 1970 to 19 percent percent in 1990. At the same time it was found that the share of imports from parents in relation to total sales, among acquired affiliates was only 7 per cent in 1990, compared to 20 percent among green-field affiliates.

As was noted, there was a growing share of affiliates receiving no imports from parent-firms (in total almost 24% in 1974 compared to almost 40% in 1990). The shares of affiliates that in 1990 imported only finished goods, only intermediate inputs or both categories of products, were about the same or around 20 percent of affiliates. The proportion of affiliates that were, at least partly, importing intermediate products has decreased from 59 percent in 1974 to 40 percent in 1990. Furthermore, it was found that, an increase in affiliates' intra-firm imports of input goods, as well as finished products, were significantly determined by increasing R&D intensity by parent-firms, while decreasing degrees of intra-firm imports were associated with an increase in the degree of multinationality of parent-firms, as well as by takeover as entry mode. A high resource dependence on the parent-company was found to favour intra-firm imports of intermediate inputs, but not finished products. Intra-firm imports of inputs were also associated with a high concentration of operations in a small number of countries. A high export-ratio, both to third countries, and exports back to Sweden, stimulated imports of inputs, but diminished the propensity to import finished goods.

Thus, one conclusion drawn from studies of intra-firm trade in Swedish TNCs, is that a high proportion of intra-firm trade need not be indicative of vertical integration of production. Rather, the two types of trade are internalized, partly for different reasons and relate to the structure of firm operations in varying ways. Hence, an accurate indicator of vertical integration is not intra-firm trade in general, but intra-firm trade in intermediates specifically.

4.5 Intra-corporate coordination of different functional activities

The fourth broad aspect of integrated international production, considered in the present study, relates to the extent that TNCs and their foreign located affiliates integrate other parts of their value-chains, except those related to exports, intra-firm sales and intra-firm purchases, as discussed above. In order to analyse to what extent affiliates integrate different parts of their value chains with other parts of parent-corporations, three indicators will be used. The first of these indicators takes into account the extent to which MOFAs claim that they coordinate their different functional activities (e.g. R&D, procurement, marketing) with other parts of the parent-corporation, alternatively, operate these functions independently. The second indicator relates to the importance of intra-corporate cooperation when generating technological competencies, alternatively, the importance of inter-firm cooperation, i.e. cooperation with customers and suppliers, in order to generate technological competencies. The third indicator of functional integration focuses on the relatively new phenomenon of foreign-located affiliates operating as competence centres, by investigating the extent in which foreign located affiliates receive corporate responsibilities in different functional areas, on behalf of parent-or sister-firms.

Discussing the tendency of affiliates to coordinate their functional activities (e.g. R&D, procurement, marketing), as a point of departure, we look at a firm which typically purchases material inputs and services, hires and trains employees, produces goods and services, and distributes and markets those goods and services to its customers. Following Porter (1986), each of these separate stages of a firms' operation can be seen as a chain of value adding activities, visualized as in Figure 4.1.

Figure 4.1 *A value-chain of a firm*
Source: Adapted from Porter (1986)

Most firms engaged in foreign production have organized their international value chain on a country by country basis, with little or no coordination of affiliates located in various host countries (Porter 1986). However, recently, the strategies for organizing cross-border production of goods and services include, not only decisions about where to locate various parts of the firms' value chain, but, increasingly, even decisions concerning the extent of integration and coordination among the entities that fall under the common governance of the firm (UNCTAD-DTCI 1993). Due to major changes in the international economic, technological and political environment, TNCs in many industries tend to adopt strategies and structures that involve closer integration of their functional activities, including the sharing of pooled resources.

Broadly speaking, we may distinguish between three types of international strategies used by TNCs operating cross-border activities (UNCTAD-DTCI 1993), see Figure 4.2. Firstly, one of the most common forms of TNC strategy is the establishment of "stand-alone affiliates", where individual affiliates typically, operate independently from the parent-organization, at least as long as it is profitable. Major links between the parent-firm and their affiliates include, basically, the transfer of technology and long term capital. Normally, this type of affiliate is responsible for most parts of their value chain. Substantial linkages may be developed to host country suppliers. Local managers and workers may be hired, capital may be raised through local financial institutions and the affiliate produces mainly for the host market, although it may also be engaged in international trade with other countries.

Secondly, in some industries, especially where the production process is labour intensive, e.g. in the clothing and electronic component industries, TNCs have started to out-source parts of their value chain, e.g. assembly operations, to countries which are perceived to offer the best conditions for that particularly activity (for examples

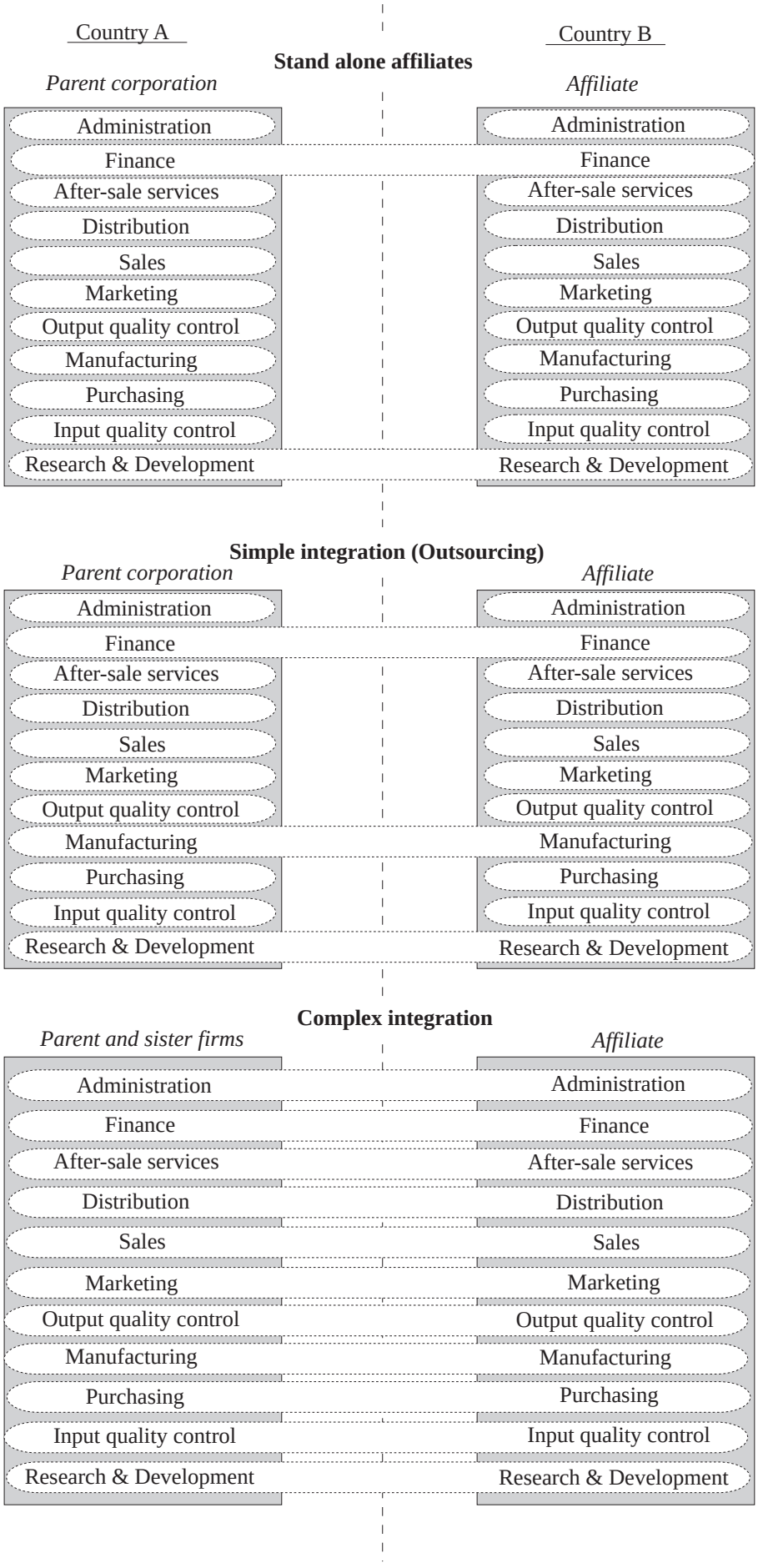


Figure 4.2 *Different types of integrated international production*

Source: Adapted from UNCTAD-DTCI (1993), pp 162-163

see Dicken 1992). Such outsourced international production, characterized by the adoption of "simple integration strategies" include a transfer of at least some value adding activity to countries other than the home country and the final sales markets. The outsourced production is controlled by the TNC, either through the ownership of an affiliate, or through non-equity arrangements with local subcontractors. As the main objective of oursourcing is to benefit from country differences in factor endowments of only certain parts of the value chain, TNCs need to integrate these activities with other corporate resources, e.g. R&D and marketing, in order to produce and market a final product for customers in the home country or in various export markets.

Thirdly, TNCs have also recently started to integrate not only manufacturing operations on an international scale, but also a host of other functional activities through a "complex integration strategy". This is based upon a firm's ability to shift production or any other part of the value chain to wherever it is found to be most profitable. Under complex integration, a substantial functional integration of processes in various locations is taking place, although not all parts of the value chain can or are likely to be integrated in the same manner. Empirical indications suggest that those functional activities TNCs undertake in an integrated manner primarily include R&D, procurement, manufacturing, accounting, finance, training, corporate planning and the legal activities (UNCTAD-DTCI 1993).

Industrial economic characteristics seem to make international integration, or non-integration strategies more or less attractive to TNCs. Table 4.9 contains factors identified as being among the most critical in favouring international integration and non-integration strategies (Prahalad-Doz 1987). The competitive advantages of integrated and non-integrated TNCs are in principle of different natures. Most of the advantages of non-integrated TNCs are knowledge-based, including superior technology and a world-wide scanning capacity for low-cost purchases and markets, together with industrial experience and marketing expertise which can be replicated from country to country. Integrated TNCs benefit from the same assets, and, in addition, also benefit from the more usual advantages of the large firm with

Table 4.9 *Critical factors favouring international integration and non-integration strategies*

Factors favouring international integration strategies	Factors favouring international non-international strategies
Importance of multinational customers	Differences in customers needs
Presence of multinational competitors	Differences in distribution channels
High investment intensity	Availability of substitutes and the need to adapt
High technology intensity	Fragmented market structure
Pressure for cost reduction	Host government demands
Universal needs	
Access to raw materials and energy	

Source: Based on Prahalad -Doz (1987) p 16-21

specialized branch plants. In particular, the absolute scale of production can be raised by pooling demand from various national markets. Although no systematic empirical evidence exists on exactly which TNCs have integrated their operations in which business, existing findings seem to suggest that integration is taking place, mainly in maturing high-technology industries with standardized products and processes that are sensitive to scale economies.

While the degree of integration of affiliates and parent-firms may fall somewhere between a continum from none to extensive, the geographical scope of such integration may range from the local to the global. Affiliates operating with a "multi-country strategy" primarily serve the host country market, as the parent-firm controls several affiliates in different markets. Recently however, TNCs have started to organize production activities based on a "regional strategy", including affiliates located in various host countries inside a single economic area, e.g. the EU or NAFTA (UNCTAD-DTCI 1993). Here, individual affiliates may serve the whole region through specialized production, based on economies of scale, and the free movement of goods, capital, technology and people. A few TNCs are even capable of organizing their value-adding activities world-wide through a "global strategy". These TNCs want to be present in all the world's markets in order to take advantages of the growth and convergence of demand, as well as to efficiently meet competitors on the most important markets. Although evidence exists on the spread of TNCs, operating with global strategies, this is still restricted to relatively few companies, and normally includes the integration of only some parts of the firms' functional activities. Due mainly to restrictions on extra-regional trade, most TNCs engaged in integrated international production, arrange this on a regional, rather than a global, basis (ibid).

4.6 Inter-firm and intra-corporate technological cooperation

The fifth aspect of integrated international production that empirically will be analysed in the present study, relates to one of the most important areas of coordination between various parts of a TNC: the transfer of technological competencies and skills. To begin with, the importance of TNCs as generators of technological development can be indicated by the fact that out of all global civilian R&D expenditures, today, more than 75 percent are estimated to be accounted for within TNC systems (Dunning 1993). On the basis of the number of patents granted, the world's 700 largest industrial firms, most of which are TNCs, account for around half of the world's commercial inventions (Cantwell 1994b). Normally it is found that most R&D activities and the generation of new products and production processes in TNCs are generated by parent-firms in the company's home country and thereafter transferred to affiliates abroad. (UNCTAD-DTCI 1995). Although foreign-located affiliates of TNCs, today perform a host of different value adding activities, including R&D, many, probably the most, are basically engaged in production activities. For

these affiliates, the transfer of production technology from the parent-firm, or other part of the TNC system, is a primary benefit. Production affiliates acquire technology from other parts of their corporate network in various ways, including imports of machinery, intermediate and final products, as well as services. The extent to which technology is transferred or made available to affiliates depends, among other things, on the forms of activities the affiliates perform, the motive and strategies of parent-firms investing in a particular affiliate and the skills and know-how that can be mobilized in an affiliate (UNCTAD 1995).

Gradually however, TNCs have also been found to disperse their R&D activities to their affiliates as well. The main driving force for this dispersion can mainly be related to four sets of factors (UNCTAD-DTCI 1995). Firstly, world-wide competition increases the need to tap knowledge, expertise and skills wherever they are located in the world in order to secure the basis for the innovatory activities that give rise to created, proprietary assets. Secondly, dispersion of R&D is further facilitated by the availability of a large pool of scientifically and technically trained manpower throughout the developed world. Thirdly, advances in communication and information technologies allow a division of R&D into self-contained divisible activities that can take place in geographically separate locations, to be subsequently integrated. Fourthly, changes in regulatory frameworks, e.g. a liberalization regarding foreign participation, in terms of ownership and better access to local universities and science and technology centres, coupled with the strengthening of intellectual property rights, has encouraged the dispersion of R&D by TNCs.

TNCs not only undertake R&D activities by combining the resources and technological capabilities of their own system, but also by establishing collaborative relationships with external firms, e.g. suppliers and customers as well as with universities and independent R&D institutions. This can be arranged through various forms of collaborative arrangements, such as technology alliances and joint ventures, which allow information sharing, joint problem solving, cooperative resource sharing and collective implementation. Although it is hard to estimate the general significance of such cooperative arrangements, mainly because of the lack of definitions and data, the literature on the subject seems to suggest a clear tendency to rapid growth since the 1970s (Sachwald 1994). What seems clear is that during the 1980s, FDI has become not only a means of access to markets for final output, but also a means of access to factors of production, particularly created assets, with a view among many TNCs towards organizing production internationally. The importance of foreign created pools of capabilities and resources for generating competitive advantages in TNCs can be illustrated by empirical results from a recent study of around 100 of the world's largest TNCs (UNCTAD-DTCI 1995), indicating that a substantial part of these firms' competitive advantages were derived from their foreign-based activities. One of the most significant competitive stimuli for these TNCs was related to linkages with foreign firms. This was perceived as a specially important competitive-enhancing source by European TNCs, while US and Japanese TNCs indicated natural resources and unskilled labour as the more important factors in generating competitiveness.

4.7 Foreign affiliates as competence centres

The sixth and final indicator of integrated international production that will be considered in the present study, is related to the relatively recent phenomenon of foreign affiliates operating with corporate responsibilities on behalf of other parts of the parent-corporation. This suggests that, today, TNC-integration, not only runs vertically, where parent-firms coordinate their foreign affiliates, but also that integration is taking place between affiliates, at the same time as individual affiliates also play a strategically important role on behalf of parent-firms.

Normally, TNCs are often seen as hierarchical organizations, where the parent-firm makes the most important decisions related to investments, product development and market expansion, while the affiliates basically have an operative responsibility for implementing parent-firms' strategical decisions. For example, traditional FDI-theories (e.g. Kindleberger, 1969 Hymer, 1976, Calvet 1981, Buckley and Casson, 1976, Kogut 1990), focus mainly on new investments through green-field investments, where firm-specific advantage, built on assets generated at the home-base, are seen as crucial when establishing affiliates in a foreign market. Also, different stage models in the traditional management literature (e.g. Ansoff 1965, Wertheimer 1971, Taylor 1975, Johanson and Vahlne 1977, Håkanson 1979, Taylor and Thrift 1982, Nordström 1991, Buckley and Ghauri 1993), often take an explicitly hierarchical view of the TNC, where the international activities are often described as gradually increasing commitments to markets further and further away. Here, the parent-firm is making market-oriented investments which are strongly related to its own operation in the home base. Increasing international commitment is also seen as paralleled by changing organizational firm structures, where the landmark study of American TNCs by Stopford and Wells (1972), suggested that a worldwide corporation typically adopts different organizational structures at different stages of international expansion, ideally: international divisions, area divisions, product divisions and finally global matrix organizations. The internationalization process seems also to be accompanied by a changing managerial attitude to domestic and international businesses, which, following the classical typologization suggested by Perlmutter (1969), gradually changes from being ethnocentric (home-based) to polycentric (host-nation-orientated) and ultimately geocentric (internationally orientated).

However, confronted with the increasing complexity, diversity and change in many industries during the 1980s, managers in many worldwide organizations have been forced to look for new organizational solutions, as the area-, product- and matrix organizations have not been without problems (Robock, and Simmonds 1989, Rugman et al 1985). The hierarchical perspective on the internationalization process of firms is now increasingly questioned as many companies' foreign-based operations during the years have expanded to become dominant in relation to the operations located at the home-base. During the 1980s, many overseas affiliates have also acquired a greater range of production and product programmes, as well as their own

product development, resulting in a new picture of less hierarchical TNCs emerging. In this situation, for an internationally experienced firm with large assets abroad, the home-based generated assets may be of lesser relative importance, compared to a firm which has recently started to expand abroad. Instead, in many highly internationalized firms', investments may be based on the degree of internationalization as such, rather than on the exploitation of initial advantages generated in the home-country (Sandén and Vahlne 1976, Johanson and Mattson 1985, Sölvell 1987).

In recent studies of the organizational design of TNCs, a new picture emerges which suggests that the traditional hierarchical organization, where parent-firms coordinate and integrate a number of foreign located operations based on assets generated at the home-base, is now beginning to be complemented by TNCs characterized by less hierarchical structures, where affiliates are playing an important role as generators of competitive advantages through product development, marketing, as well as strategical responsibilities of different functional activities on behalf of other parts of the group.

In studies of organizational designs, Bartlett and Goshal (1988) have identified four general ways in which world-wide TNCs tend to manage their foreign operations. Firstly, in what are identified as "multinational" firms, the role of foreign affiliates is basically focused on sensing and exploiting local opportunities, where the key variable to competitive advantages is the differentiation of products between geographical markets. Secondly, affiliates operating in "global" firms, basically tend to implement parent-company strategies, where the competitive edge is seen as based on scale economies and cost leadership. Thirdly, the strategic task of affiliates in "international" firms is mainly to adapt and leverage parent-company competencies, based on innovations, created at headquarters. However, as industrial demands have become more complex, these three traditional forms of TNC-management of foreign affiliates, are suggested as being replaced by more dynamic forms of strategic flexibility. A fourth model, which tries to build systematic differentiation of roles and responsibilities into different parts of the world-wide corporation, is suggested to emerge: the "transnational" organization. Instead of either centralizing or decentralizing assets, corporations with a "transnational" organization are making selective decisions on which assets and value-adding activities are to be centralized and which decentralized. The resulting structure of a "transnational" company is a complex network, characterized by significant flows of components, products, resources, people and information. Fundamental to this new model is a different set of justifications and assumptions about the role of the company's international operations. In this perspective, the foreign affiliates are seen as strategic partners, whose knowledge and capabilities are vital to the corporation's ability to remain globally competitive.

Empirically, different forms of the corporate responsibilities of affiliates may be identified (UNCTAD-DTCI 1993). For example, in some TNCs, individual affiliates may operate as "product-line headquarters", either regionally or globally, where the

affiliates are responsible for coordination of all functions related to a particular product line, while affiliates operating as "regional headquarters" are responsible for coordinating and supporting activities of all affiliates in a geographical region. In some TNCs individual affiliates may operate as "functional headquarters", responsible for particular activities, e.g procurement or marketing, for a TNC, which would otherwise be undertaken separately in home and host countries.

One indication that TNCs are taking different forms of networks of inter-related affiliates and parent-firms, is found among a number of bigger Swedish TNCs, with long-time experiences of managing foreign operations. According to the "Uppsala School", originally put forward in the 1970s (e.g by Hörnell, et.al 1973, Johanson and Wiedersheim-Paul 1974, Johanson and Vahlne 1977, and Carlson 1979), the internationalization process of many Swedish firms has been characterized by a successive increase in involvement on the foreign markets, where the parent-company in Sweden has established foreign operations, first through exports via an agent and wholly-owned sales companies and, later, local assembly and the establishment of complete production for the local market. However, as the international market expands, the foreign affiliates may build, or acquire, a greater degree of competence, resulting in that they become less dependent on the parent-company in terms of product development, production and marketing. Based on their own competence, the foreign affiliates may start to expand to other markets outside their original host market, sometimes in competition with other units of their parent-company. Eventually, one of the foreign located affiliates has generated specific competencies in certain product or functional areas, leading to strategic responsibilities for parts or the whole company group. Thus, a situation could arise with a TNC consisting of several geographically dispersed centres, rather than one centre and a periphery, constituting a "heterarchical" TNC, (Hedlund 1986, Hedlund and Rolander 1991), where affiliates are playing a strategic role, not only in their own operations but also for the entire group within a certain product or functional area.

Empirical studies of large Swedish TNCs (Larsson et. al 1987, Forsgren 1989; 1990, Forsgren et.al 1991, Holm 1994) show that a less hierarchical structure is emerging in many Swedish TNCs, in so far as there are several formal management centres which have developed as well as informal "power concentrations" in many foreign affiliates, apart from the group management. These foreign affiliates control resources, giving them responsibilities on behalf of other parts of the company, for a whole range of functions far beyond the need for the local market. In order to identify foreign-based centres in Swedish TNCs, five indicators were used, of which four were related to production, marketing, purchasing and R&D, respectively, and one to the formal organization of the firm (Forsgren et. al 1992, Holm 1994). A production centre was defined as a foreign subsidiary manufacturing and selling a product to at least five countries except the local market. These sales had to account for at least 25 percent of the subsidiary's turnover. To qualify as a production centre, the subsidiary must also have product-development of its own. A market centre or a purchasing centre

was identified as a subsidiary with full responsibility for the marketing or purchasing of the products within a business area encompassing at least five countries, while a subsidiary was identified as a research centre if it independently carried out R&D, aiming at fulfilling the requirements of the group as a whole, or a large part thereof. The fifth indicator of foreign-based centres was related to the extent to which the heads of the firm's divisions (or business areas) were stationed in a foreign subsidiary. These was identified as management centres.

Using these definitions of foreign-based centres, 22 large Swedish TNCs, responsible for over 90 percent of the Swedish industry's total employment abroad, were investigated. In 1989, the 22 investigated TNCs were found to consist of 296 foreign-based centres. The most common foreign centre was related to production (206) followed by marketing and management centres (41 and 31 respectively). Research centres were less common (18), while purchasing centres were non-existent. Most foreign-based centres were found in Europe (except the Nordic countries) and in North America. The studies indicated that foreign centres especially appear in countries where the Swedish firms have been operating for a long time and have their largest markets. It was also found that foreign centres were over-represented in relation to foreign employment, in Europe and North America.

The general conclusions from these studies seem to suggest that a less hierarchical structure emerges in many internationalized firms. This is not to say that the integration of production tends to become less significant compared to the traditional hierarchical organization. Instead, the integration of production tends not only to be vertical, where knowledge, components and products run from parent-firms to their affiliates, but also, that flows of resources tend to run horizontally between different affiliates, and also from affiliates to parent-firms. In other words, a more network-like TNC-organisation seems to evolve, where integration of various parts of the firms operations may be more extensive, compared to a situation where the parent-firm controls the most important resources.

4.8 Summary and specification of research questions

In this chapter, some basic concepts and earlier empirical findings related to integrated international production have been presented. Firstly, foreign affiliates are not only engaged in host market production but increasingly seem to be engaged in exports of manufactured goods, mainly to third country markets. Another important indication of integrated international production can be seen in the fact that an increasing share of these exports by affiliates is organized as intra-firm sales, consisting of intermediate products aimed at further processing by other units of parent-corporations, as well as finished products distributed through parent-corporations' sales-organisation to external customers. Correspondingly, a substantial amount of parts, components and other material inputs used by foreign affiliates is imported from sister or parent-firms through intra-firm purchases. Another possible indication of a growing tendency

towards integrated international production can be seen in the fact that many of the functional activities of foreign affiliates seem increasingly to be managed in a coordinated fashion, rather than autonomously by affiliates located in different countries. One of the most important of these functional activities which TNCs try to operate in an integrated fashion was suggested to be related to the generation and dispersion of technological competence. Here, foreign-located pools of capabilities held by affiliates, as well as by competitors, suppliers and customers in various countries, are seen as being a vital complement to technological competencies generated by the R&D departments of parent-firms. Finally, the recent phenomenon of foreign affiliates operating as competence centres on behalf of other parts of parent-corporations was suggested to be another indicative and important dimension of integrated international production.

Below, a number of aspects will be empirically investigated, each of which are related to the discussion of basic concepts and earlier empirical indications of integrated international production, presented above. Firstly, as was suggested above, integrated international production in terms of exports by foreign located affiliates is a relatively new phenomenon, since most affiliates have been, and probably still are, mainly producing for the local or nearby markets. Therefore, the first aspect of integrated international production, which empirically will be analysed below, investigates to what extent MOFAs are involved in export activities, alternatively, are focused on the local market in Sweden. The collected data makes possible a thorough analysis of MOFAs sales markets, distinguishing between products that are manufactured by the affiliate in Sweden, and products which have been manufactured by parent- and sister-firms abroad and distributed through resale activities by MOFAs in Sweden. Hence, it is possible to present a detailed account of which MOFAs are engaged in host-market production and manufactured exports, respectively.

Above, the growing tendency whereby TNCs and their affiliates are engaged in intra-firm trade of finished products and intermediate input goods was identified as another, strong indicator of integrated international production. The second aspect of integrated international production that empirically will be investigated in the present study, relates to the extent to which MOFAs are integrated into parent-corporations through intra-firm sales and purchases. Most studies on intra-firm sales do not distinguish between finished products and intermediate input goods. In the present study, however, the quality of collected data makes possible a distinction between products that are manufactured by the affiliates in Sweden, in terms of finished products distributed to external customers through the parent-corporations international sales organization, and intermediate input-goods, aimed at further processing by parent- or sister-firms. This also facilitates a detailed analysis of the extent, as well as the form, of vertical integration among MOFAs. Furthermore, in studies on intra-firm purchases among foreign located affiliates, it is not normally possible to distinguish between products used as intermediate input-goods by the

affiliate, and finished products imported from parent- and sister-firms and distributed to external customers through resale activities. In the present study, however, data on intra-firm purchases of material inputs has been collected separately. In addition, intra-firm purchases of intermediate input-goods are related to total purchases of material inputs, rather than to total sales, which is the normal, but less accurate way of measuring intra-firm purchases. This facilitates a thorough analysis of backward vertical integration in terms of intra-firm purchases of material inputs, *per se*, rather than intra-firm purchases in general.

Thirdly, the review above also showed that TNCs, instead of operating a number of independently managed affiliates, increasingly seem to be organizing their geographically dispersed activities in an integrated fashion, resulting in a complex network of interrelated TNC-units. In order to analyse the extent in which MOFAs in Sweden integrate other parts of their functional activities with parent-and sister-firms outside Sweden, except those related to exports and intra-firm trade discussed above, three indicators will be used. The first of these indicators relates to the extent in which MOFAs claim that they coordinate their different functional activities (e.g. R&D, procurement, marketing) with other parts of parent-corporation outside Sweden, alternatively, operate these functions independently. The second indicator of functional integration investigates the importance of cooperation with corporate firms, alternatively, external firms, e.g. customers and suppliers, in order to generate technological competencies. The third indicator of functional integration focuses on the relatively new phenomenon of foreign-located affiliates operating as competence centres; investigating the extent in which MOFAs have received corporate responsibilities on behalf of parent- or sister-firms outside Sweden.

Based on the discussion above, the next chapter presents a general empirical analysis of MOFAs located in Sweden, related to the first, general, objective of the study (set out in section 1.2):"*to describe the extent of integrated international production, i.e. transactions between MOFAs located in Sweden and their parent- and sister-firms located outside Sweden*".

A specification of this objective results in seven research questions;

i) To what extent are MOFAs' products sold on the Swedish host market, alternatively, exported to different foreign markets, distinguishing between manufactured products and resale?

ii) To what extent are MOFAs integrated with other parts of parent-corporation through intra-firm sales of manufactured products, distinguishing between intermediate input-goods aimed at further processing by sister- or parent-firms, and finished goods aimed at resale to external customers?

iii) To what extent are MOFA purchasing material inputs from suppliers in Sweden, alternatively, importing them from suppliers abroad?

iv) To what extent are MOFAs vertically integrated with parent- and sister-firms through intra-firm purchases of material inputs?

v) To what extent are different functional activities of MOFAs coordinated with parent- and sister-firms?

vi) To what extent are MOFAs involved in cooperation with parent- and sister-firms, alternatively, external firms (e.g. suppliers and customers) in order to generate technological competence?

vii) To what extent do MOFAs operate as competence centres, indicated by their having corporate responsibilities in different functional areas, on behalf of parent- and sister-firms?

In the next chapter a general analysis of all MOFAs included in the study will be presented, showing the estimates of integrated international production, as specified in these seven research questions.

5. INTEGRATED INTERNATIONAL PRODUCTION: GENERAL EMPIRICAL FINDINGS

5.1. Introduction

We now start the presentation of the empirical findings on integrated international production of MOFAs located in Sweden in 1993. Below a summarized picture of all MOFAs included in the study will be presented, showing the estimates of integrated international production, as specified in the seven research questions presented in chapter 4. In section 5.2 a presentation of local sales and exports by MOFAs is given, including an analysis of intra-firm sales. Section 5.2.1 focus on the extent in which MOFAs are involved in resale of products on behalf of sister- and parent-firms. Section 5.2.2 shows the importance of host market production and manufactured exports, while section 5.2.3 presents the empirical findings on intra-firm sales of manufactured output. Section 5.2.4 presents a comparison of export-intensity of MOFAs and domestic firms in Sweden, in order to analyse whether the foreign affiliates tend to be more export oriented compared to domestic firms. In section 5.3, the presentation turns to the purchasing of material inputs. Section 5.3.1 shows findings on the extent in which MOFAs purchase material inputs from suppliers in Sweden, alternatively, import these from suppliers abroad, while section 5.3.2 focuses on backward vertical integration through intra-firm purchases of material inputs. In section 5.3.3 an attempt is made to analyse whether MOFAs import a larger share of inputs compared to domestic firms. Section 5.4 presents empirical findings on functional integration of other parts of MOFAs' value-chains, focused on intra-corporate coordination of different functional activities (section 5.4.1), inter-firm and intra-corporate cooperation in order to generate technological competence (section 5.4.2), and MOFAs operating as competence centres on behalf of parent or sister firms (section 5.4.3). The most important findings of this chapter are summarized in the subsequent chapter 6. There, an attempt is also made to put some of these findings into a historical, as well as contextual perspective, discussing the extent in which integrated international production among foreign manufacturing affiliates in Sweden has changed during the last decades, and whether the findings on MOFAs in Sweden are specific, or rather, in line with what has been found in other countries. Together, this gives us a series of references that can be related to established TNC theory.

5.2 Sales

5.2.1 Resale of corporate products

One of the basic differences in affiliates' operations in various host markets is the extent to which these are engaged in local sales, alternatively exports to different

markets outside the host country. Below, an analysis of MOFAs' sales-markets will be presented distinguishing between products sold on the Swedish host market and products sold in seven different export-markets: the Nordic market (except Sweden), Western Europe, Russia/East Europe, North America, Latin America, Japan/South East Asia and Rest of the World. The collected data lets us make a distinction between products that have been manufactured by the individual affiliates in Sweden and those that are produced by corporate firms abroad and distributed through resale activities. The findings of sales-markets of resale and manufactured products relate to the first research question, set out in section 4.6, above, i.e: *to what extent are MOFAs' products sold on the Swedish host market, alternatively, exported to different foreign markets, distinguishing between manufactured products and resale?*

Although all MOFAs are manufacturers, parts of their total turnover consists of products imported from their parent- or sister-firms for resale. Therefore, before presenting the results on manufactured sales by MOFAs, some indications of the extent of resale of corporate products on behalf of parents or sister-affiliates are given. In total, out of the 296 affiliates included in the study, 148, or 50 percent, operated as marketing channels through resale of products manufactured by parent or sister firms. As can be seen in Table 5.1, resale accounts for 13 percent of MOFAs total turnover, while manufactured sales account for 87 percent.

Table 5.1 *Percent resale and manufactured sales by MOFAs located in Sweden 1993.*

Resale	Manufactured sales	Total sales
13	87	100

Source: Survey data by the author

Table 5.2 shows that products that are sold on behalf of parent- or sister-firms are basically aimed at the local Swedish market. In addition we find that almost 10 percent is sold in the Nordic market, outside Sweden, and another 4 percent in Western Europe. From this we can conclude that, although these affiliates are manufacturers, in part, they also act as marketing channels for other parts of parent-corporations, primarily in the local Swedish market and in the adjacent Nordic market.

Table 5.2 *Percent resale in different markets among MOFAs located in Sweden 1993*

	Sweden	Nordic excl. Swe	Western Europe	Russia/ East Europe	North America	Latin America	Japan/ SE Asia	Rest of world	Total	N
TOTAL	83	8	4	1	2	0	1	1	100	296

Source: Survey data by the author

Table 5.3 shows that the highest shares of resale are found in German and Swiss affiliates, where between one fifth and one quarter of the total turnover is based on resale of corporate products, while resale is lowest (10% or less) in affiliates based in the UK, Finland and Norway.

Table 5.3 *Percent resale of total sale by MOFAs located in Sweden 1993, by home country*

Home country	% resale in total sales	N
Denmark	14	15
Finland	9	72
Norway	10	39
France	11	19
Germany	26	29
The Netherlands	12	23
Switzerland	23	20
UK	8	30
USA	13	33
Other	10	16
TOTAL	13	296

Source: Survey data by the author

Furthermore, as Table 5.4 shows, comparably high shares of resale are found in MOFAs operating in the petroleum, coal products and other chemical industries, in which resale represents some 25-30 percent of total turnover. Also, in the plastic-,

Table 5.4 *Percent resale in total sale by MOFAs located in Sweden 1993, by industry*

Industry	% resale in total sales	N
Food products	19	17
Textiles, wearing apparel	11	11
Wood products, Furniture	1	9
Pulp and paper	1	13
Printing, Publishing	6	4
Industrial chemicals	16	28
Other chemical products	25	25
Petroleum, Coal products, Rubber products	32	4
Plastic products	21	12
Pottery, Glass, Non-metal products	5	21
Iron and steel-, Non-ferrous metals	3	14
Fabricated metal products excl. machinery	15	39
Machinery, except electrical	4	48
Electrical machinery and apparatus	20	19
Transport equipment	15	14
Professional goods	17	9
Other manufacturing industries	17	9
TOTAL	13	296

Source: Survey data by the author

electric machinery apparatus- and food industries, resale represents a sizable share, reaching around one fifth of affiliates' total sales. At the same time, only marginal shares of resale are identified in affiliates operating in the pulp and paper-, wood products-, iron and steel- and non-electrical apparatus industries.

5.2.2 Manufactured sales

Turning to the analysis of manufactured products, we find, according to Table 5.5, that, in total, a less than half of production is sold on the domestic market in Sweden. We find also, that the neighbouring Nordic market is responsible for around one tenth of total sales, indicating that the manufacturing strategies among MOFAs in Sweden is only partly motivated by local market production, even if we define this as the total Nordic market. The largest export markets are found in Western Europe, accounting for 25 percent of total sales. Non-European sales are also found, mainly in North America and in Japan/South East Asia, with 6 percent, respectively, of total sales. Sales in Russia/Eastern Europe, Latin America and Rest of World can also be found, although accounting for only marginal shares of manufactured output. The proportion of sales in different markets among the 17 largest MOFAs, measured by total sales figures, and the rest of the affiliates, are almost identical. This seems to suggest that the total picture of sales performance is not to any dramatic degree biased by the largest affiliates' sales profile.

Table 5.5 *Manufactured sales in various markets by MOFAs located in Sweden 1993. Percent*

	Sweden	Nordic excl. Swe	Western Europe	Russia/ East Europe	North America	Latin America	Japan/ SE Asia	Rest of world	Total	Total sales (MSEK)	N
"17 -group"	46	10	27	1	7	1	7	2	100	28218	17
"279-group"	48	12	25	1	5	1	5	2	100	39040	279
TOTAL	47	11	25	1	6	1	6	2	100	74952	296

Note: "17-group"= The 17 largest foreign-owned affiliates in terms of manufactured sales (+1Bn SEK in 1993.); "279-group"= All other affiliates included in the study

Source: Survey data by the author

Furthermore, in Table 5.6 it can be seen that almost all MOFAs are engaged in at least some export activities. While only 10 percent of the affiliates focus on host-market production, i.e. performing no exports, as many as 39 percent sell the majority of their manufactured output in various export markets.

Table 5.6 *Exports of manufactured sales by MOFAs located in Sweden 1993. Percent.*

	0%	1-10%	11-25%	26-50%	51-75%	76-100%	Total	N
TOTAL	10	15	18	18	16	23	100	296

Source: Survey data by the author

If these figures are studied in more detail, as in Table 5.7, it can be seen that a majority of exporting MOFAs sell their manufactured products outside the Nordic market. Only 18 percent of these affiliates, export exclusively to the neighbouring Nordic market. At the same time, 28 percent sell most of their exported products outside the Nordic market. Thus, the export activities of MOFAs seem to be only marginally directed to the Nordic market alone.

Table 5.7 *Percent exports outside the Nordic market of total manufactured sales by MOFAs located in Sweden 1993. Percent of firms. Only affiliates with exports.*

	0%	1-10%	11-25%	26-50%	51-75%	76-100%	Total	N
TOTAL	18	21	14	19	12	16	100	266

Source: Survey data by the author

Rather, as is shown in Table 5.8, a substantial share of exporting affiliates sell to various markets outside the Nordic market. Most of these affiliates, or three quarters, export to Western Europe, while around one third export to North America, Japan/South East Asia as well as Rest of World. Around one quarter of MOFAs export to Russia/Eastern Europe and 15 percent to Latin America.

Table 5.8 *Affiliates which export to various non-Nordic markets, among MOFAs located in Sweden 1993. Percent of exporting affiliates.*

	Western Europe	Russia/ East Europe	North America	Latin America	Japan/ SE Asia	Rest of world	N
Affiliates exporting to various markets	75	26	33	15	33	30	266

Source: Survey data by the author

Although most of manufactured output is exported to non-domestic markets, we also find that the degree of local sales and exports varies substantially between different affiliates. Firstly, if we analyse sales of affiliates based in different home-countries it is found in Table 5.9 that those based in Denmark, Switzerland, Norway and The Netherlands, in large, can be identified as host-market oriented, selling two thirds or

Table 5.9 *Percent manufactured sales in different markets by MOFAs located in Sweden 1993, by home country*

Home-country	Sweden	Nordic excl. Swe	Western Europe	Russia/ East Europe	North America	Latin America	Japan/ SE Asia	Rest of world	Total	N
Denmark	89	7	3	1	0	0	0	0	100	15
Finland	38	14	26	1	7	1	9	4	100	72
Norway	63	13	14	0	2	2	3	2	100	39
France	57	8	20	1	8	1	4	2	100	19
The Netherlands	62	7	23	2	3	1	2	1	100	23
Switzerland	72	6	19	0	1	0	2	1	100	20
Germany	35	9	37	2	8	1	5	3	100	29
UK	39	19	33	1	1	2	3	3	100	30
USA	37	10	34	1	8	1	6	2	100	33
Other	36	7	29	1	15	1	11	2	100	16
TOTAL	47	11	25	1	6	1	6	2	100	296

Source: Survey data by the author

more in Sweden. At the same time, MOFAs based in Germany, USA, Finland, UK and "Other" countries can be seen as export-orientated, selling around two thirds outside Sweden. One third, or more, of total manufactured sales are directed to Western Europe by MOFAs based in Germany, USA, and UK. One fifth of total sales of UK affiliates are also designated to the adjacent Nordic market. Non-European sales, representing between 15-20 percent of total manufactured sales, can mainly be found among MOFAs headquartered in Finland, USA, and Germany. Affiliates based in the "Other" category show even higher shares of Non-European sales, accounting for almost 30 percent of total sales. Generally, most extra-European sales are directed to North America and Japan/South East Asia.

Secondly, from an industry perspective, in total terms, host market production seems to dominate in the printing-, food-, plastics-, pottery-, and other manufacturing industries, see Table 5.10. High shares of exports are found in affiliates operating in the professional goods-, non-electrical machinery-, iron and steel-, and textiles industries, where approximately three quarters or more of manufactured output is exported. In these industries, substantial shipments to North America and Japan/South East Asia, can also be identified.

5.2.3 Intra-firm and arm's-length sales

One of the most important determinants explaining foreign-located affiliates engagement in export activities is related to the organization of separate production stages through vertical integration, where individual affiliates produce intermediate

Table 5.10 *Percent manufactured sales in different markets, in MOFAs located in Sweden 1993, by industry.*

Industry	Sweden	Nordic excl. Swe	Western Europe	Russia/ East Europe	North America	Latin America	Japan/ SE Asia	Rest of world	Total	N
Food products	82	8	9	0	1	0	0	0	100	17
Textiles, wearing apparel	28	10	43	2	4	1	6	5	100	11
Wood products, Furniture	35	16	47	0	0	0	0	2	100	9
Pulp and paper	54	19	21	1	1	0	2	2	100	13
Printing, Publishing	90	9	1	0	0	0	0	0	100	4
Industrial chemicals	44	14	24	1	1	1	11	4	100	28
Other chemical products	57	15	19	1	2	0	4	2	100	25
Plastic products	78	11	8	1	0	0	1	0	100	12
Petroleum, Coal products, Rubber products	54	17	26	2	1	0	0	0	100	4
Pottery, Glass, Non-metal products	73	18	8	0	0	0	0	0	100	21
Iron and steel-, Non-ferrous metals	27	10	35	0	18	1	8	1	100	14
Fabricated metal products excl. machinery	66	10	16	1	3	0	2	1	100	39
Machinery, except electrical	19	11	34	3	13	3	12	6	100	48
Electrical machinery and apparatus	33	11	44	2	4	1	4	0	100	19
Transport equipment	65	3	28	0	2	0	1	0	100	14
Professional goods	8	3	56	2	16	1	10	4	100	9
Other manufacturing industries	72	12	10	4	2	0	0	0	100	9
TOTAL	47	11	26	1	6	1	6	2	100	296

Source: Survey data by the author

input products, aimed to be used for further processing by parent- or sister-firms, or, alternatively, where the affiliates produce finished products which are sold through the international sales organisation of parent-firms. In this section, a detailed account is presented focusing on the extent in which MOFAs are vertically integrated through intra-firm sales, distinguishing between intermediate input-goods and finished products, respectively. This facilitates an in-depth analysis of the extent and characteristics of vertical integration between MOFAs in Sweden and the rest of parent-corporations outside Sweden. Thus the findings of the present section relate to the second research question, set out in section 4.6, above, i.e: *to what extent are MOFAs integrated with other parts of parent-corporations through intra-firm sales of manufactured products, distinguishing between intermediate input-goods aimed at further processing by sister- or parent-firms, and finished goods aimed at resale to external customers?*

Notice that finished goods, as defined in the present study, relate to all products that are aimed at external customers without any further processing by parent-or sister-firms. Thus, finished goods can include industrial input goods and machinery, as well as consumer products, as long as they are distributed to external customers by parent- or sister-firms without any further processing. Material inputs, on the other hand, are defined as products that are aimed at further processing in the production process of parent- or sister-firms.

The empirical findings of intra-firm sales by MOFAs, show, firstly, that almost one quarter of total manufactured sales takes the form of intra-firm exports, see Table 5.11. Focusing on the share of international sales that are organized through internal transactions, i.e the proportion of intra-firm exports in total exports, this is substantially higher, reaching 44 percent.

Table 5.11 *Percent intra-firm exports of manufactured sales, and, percent intra-firm exports of manufactured exports, by MOFAs located in Sweden 1993.*

	Percent intra-firm exports of manufactured sales			Percent intra-firm exports	
	Finished goods	Material inputs	Total	of manufactured exports	N
TOTAL	23	1	24	44	296

Source: Survey data by the author

However, the method of organizing international sales by means of intra-firm exports to other parts of their parent-corporation is not used by all MOFAs. According to Table 5.12, approximately one third of all affiliates that perform any export, organize this exclusively on an arm's-length basis. At the same time, an equally large share of the affiliates, or approximately one third, ship most of their international sales through intra-firm exports.

Table 5.12 *Percent intra-firm exports of manufactured exports by MOFAs located in Sweden 1993. Percent of firms. Only affiliates with exports.*

	0%	1-10%	11-25%	26-50%	51-75%	76-100%	Total	N
TOTAL	32	7	10	18	15	19	100	266

Source: Survey data by the author

Parallel with the findings on host market production and exports, presented above, substantial variations exist between different affiliates in their involvement in intra-firm sales according to home-countries and industries. Table 5.13 shows that intra-firm exports in relation to total sales are especially high in German affiliates and in affiliates based in Other countries, responsible for 44 and 51 percent of total sales, respectively. The lowest rate of intra-firm exports as a proportion of total sales is found among Danish affiliates (5%) and in Norwegian and Swiss affiliates, where around 15 percent of total sales are exported on an intra-firm basis.

Table 5.13 *Percent intra-firm exports of manufactured sales, respectively percent intra-firm exports of manufactured exports by MOFAs located in Sweden 1993.*

	Percent intra-firm exports in manufactured sales			Percent intra-firm exports	
Home-country	Finished goods	Material inputs	Total	in manufactured exports	N
Denmark	3	2	5	39	15
Finland	27	0	27	42	72
Norway	10	4	14	35	39
France	16	8	25	54	19
Germany	43	1	44	62	29
The Netherlands	23	0	23	59	23
Switzerland	14	1	15	51	20
UK	19	2	21	33	30
USA	21	1	22	31	33
Other	49	1	51	69	16
TOTAL	23	1	24	44	296

Source: Survey data by the author

Also, the share of intra-firm exports of total exports is highest, or above 60 percent, in German affiliates and among affiliates based in "Other" countries. In aggregated terms, substantial shares of intra-firm exports, responsible for over 50 percent of total exports, are also found among Dutch, French and Swiss affiliates, while proportionally lowest intra-firm exports, around one third, are performed by US, UK and Norwegian affiliates

From an industry perspective, we see in Table 5.14, that the highest shares of intra-firm exports in relation to total manufactured sales is found among MOFAs operating in the professional goods and electrical machinery industries, with 77 percent and 51

Table 5.14 *Percent intra-firm exports of manufactured sales, and, percent intra-firm exports of manufactured exports by MOFAs located in Sweden 1993, by industry*

Industry	Percent intra-firm exports in manufactured sales: Finished goods	Material inputs	Total	Percent intra-firm exports in manufactured exports	N
Food products	13	0	13	68	17
Textiles, wearing apparel	20	2	22	26	11
Wood products, Furniture	3	2	5	8	9
Pulp and paper	3	2	5	10	13
Printing, Publishing	6	0	6	51	4
Industrial chemicals	38	3	40	70	28
Other chemical products	24	2	26	51	25
Petroleum, Coal products, Rubber products	36	0	36	66	4
Plastic products	6	1	6	19	12
Pottery, Glass, Non-metal products	10	0	10	32	21
Iron and steel-, Non-ferrous metals	19	5	24	32	14
Fabricated metal products excl. machinery	8	1	8	26	39
Machinery, except electrical	24	1	25	28	48
Electrical machinery and apparatus	50	1	51	72	19
Transport equipment	8	0	8	22	14
Professional goods	75	2	77	80	9
Other manufacturing industries	7	1	8	21	9
TOTAL	23	1	24	44	296

Source: Survey data by the author

percent intra-firm exports, respectively, while corresponding figures among affiliates operating in the wood-, pulp and paper-, printing-, and plastic products industries, by contrast, are only around 5 percent. If we focus on the proportion of exports that are organized by means of intra-firm sales, this is generally higher, accounting for two thirds, or more, in affiliates producing professional goods, electrical machinery, industrial chemicals, food and petroleum products. Again, affiliates in the wood-, pulp and paper- and plastics industries show the smallest intra-firm shipments.

From Tables 5.11 to 5.14, above, other interesting findings can be identified. Firstly, it can be noticed that the organization of intra-firm exports is almost exclusively dominated by finished products manufactured by the affiliates in Sweden and sold to external customers through the parent-corporations' sales-organisation. In total, intra-firm exports of material inputs for usage by parent- or sister-firms represents only one percent of MOFAs' total manufactured sales. Only in French affiliates and those operating in the iron and steel industry produce material inputs designated for parent- or sister-firms to any noticeable degree, reaching 5-8 percent of manufactured sales.

Notice, also, that 84 percent of all affiliates export no material inputs to other parts of their parent-corporations, and among those who do, this represents only a marginal share of total manufactured sales, see Table 5.15.

Table 5.15 *Percent intra-firm exports of material inputs in manufactured sales by MOFAs located in Sweden 1993. Percent of firms.*

	0%	1-10%	11-25%	26-50%	51-75%	76-100%	Total	N
TOTAL	84	12	3	1	0	0	100	296

Source: Survey data by the author

The geographical distribution of MOFAs intra-firm exports of material inputs is shown in Table 5.16, showing that this not only includes parent or sister firms located in the neighbouring Nordic countries, but, in large, also corporate firms in Western Europe and North America, and, to a marginal extent, Japan/SE Asia and Rest of World.

Examining this table in more detail, it can be seen that MOFAs based in the Nordic countries of Finland and Norway mainly supply sister- or parent-firms in the Nordic countries, while German, Swiss and French affiliates basically produce material inputs for usage by corporate firms in Western Europe. Interestingly enough, a substantial share, or around 40 percent, of French and UK affiliates' production of intermediate inputs are shipped to corporate firms in North America. Moreover, the internal sales of manufactured inputs by US affiliates are mainly directed to sister affiliates located in Western Europe. Finally, the internal sales of intermediate products among Norwegian, Finish and Swiss affiliates include also sister firms in Japan/South East Asia.

Table 5.16 *Percent intra-firm exports of material inputs to different markets by MOFAs located in Sweden 1993, by home-country*

Home-country	Nordic excl. Swe	Western Europe	Russia/ East Europe	North America	Latin America	Japan/ SE Asia	Rest of world	Total	N
Denmark	24	76	0	0	0	0	0	100	15
Finland	80	8	0	2	0	12	0	100	72
Norway	72	14	0	0	0	7	7	100	39
France	3	60	0	38	0	0	0	100	19
Germany	4	96	0	0	0	0	0	100	29
The Netherlands	0	20	0	0	0	0	80	100	23
Switzerland	27	62	0	0	0	11	0	100	20
UK	53	7	0	40	0	0	0	100	30
USA	37	54	0	9	0	0	0	100	33
Other	15	85	0	0	0	0	0	100	16
TOTAL	37	42	0	15	0	3	3	100	296

Source: Survey data by the author

5.2.4 Comparison of export-performance between foreign and domestic firms

5.2.4.1 International findings

In this section a comparison of exports by MOFAs and domestic firms is presented. This is achieved by comparing some of the results of export-performance above, with findings on export behaviour by domestic firms found in various studies. The general question asked is, to what degree MOFAs are more export-orientated than corresponding firms in Sweden. Generally, international studies on TNCs and trade-performance often identify differences in export behaviour between comparable foreign- and uni-national firms operating in the same manufacturing sectors. A generally accepted view seems to be that TNCs' affiliates generally tend to have a higher propensity to export than indigenous firms (Dunning 1993). The theoretical explanation for this is normally related to the assumption that TNCs retain some owner-specific advantages, often including a better access to information about, and greater experience of, international markets, than uni-national firms. This, together with a higher propensity to engage in cross-border intra-firm product or process specialization between different parts of the corporate network, makes TNCs more likely to exhibit both higher export-, as well as, import-intensities than indigenous firms.

Empirical studies which systematically attempt to measure the trade propensity of TNCs and comparable uni-national firms are unfortunately relatively rare. One of the earliest studies, which tries to compare trade propensities between TNCs and uni-national firms, taking the view that TNCs generally have a higher propensity to export than indigenous firms, is that by Dunning (1958) in a British context. More recent examples of empirical surveys on the comparative trading propensity among TNCs and uni-national firms include studies of TNCs operating in export-orientated sectors in Portugal (Simoes 1985), the Netherlands (Stubensky (1970), and Belgium (Van den Bulcke 1985), where in the later study, part of the explanation of the relatively higher export- and import-intensity identified among foreign-owned firms, was related to the substantial amount of intra-firm trade in which Belgium is involved. Other recent studies comparing export intensities of TNCs and domestic firms are those by Dunning and Cantwell (1987), (OECD 1994) and UN-TCMD (1992a; 1992b). In the latter studies, a general growth in the share of manufactured exports accounted for by foreign affiliates during the last two decades, was also identified.

However, examples of studies which refute the generalization that relatively higher export propensities occur among TNCs than in indigenous firms can also be found. For example, no differences in terms of export propensities were identified in a study by Michalet and Chevallier (1985), of foreign-owned subsidiaries and indigenous firms in France. Swedenborg (1985) has suggested that foreign-owned firms in Sweden have helped to upgrade the export-performance of those sectors in which local firms have a revealed comparative disadvantage, while at the same time

producing neither better, nor worse export-performance, than domestic firms in sectors where Swedish firms have a substantial competitive advantage. Examples of domestic firms with higher or equal export propensities, compared to those of foreign affiliates in all or some manufacturing industries, have also been identified in empirical surveys, including both developing countries, e.g Taiwan, (Riedel 1975, Schive 1980), Mexico (Jenkins 1979), and Morocco (Haddad and Harrison 1993), as well as developed countries, e.g Canada (Safarian 1966), the UK (Dunning 1973, Solomon and Ingham 1977, Panic and Joyce 1980, Hamel 1985), and Japan (Ozawa 1985).

The comparisons of trade propensities between foreign and domestic firms should, however, be treated with care, since quite a substantial amount of the global foreign investments by TNCs are designed towards promoting or restricting the imports or exports by their affiliates. For example, Graham and Krugman (1989) in a study of import propensities among foreign firms in the US, found that Japanese subsidiaries had a significantly higher share of import than firms based in other countries. Most of this difference in import propensity was related to the fact that Japanese firms, to a greater extent were operating as marketing firms, and that investments were disproportionally biased towards activities that make use of imported inputs.

The comparisons of trade-performance between foreign affiliates of TNCs and domestic firms are further complicated by the fact that great variations in industry- and firm-characteristics are prevalent between, as well as among the two groups of firms. The general assumption about higher trade propensities among TNCs than indigenous firms, is probably not so persuasive if account is taken for such industry-, and firm specific differences. Many of the studies on export-performance try, at least partly, to take into account industry differences between domestic and foreign firms. Other variables which might influence the export behaviour of individual firms, such as the nationality of ownership, the degree of multinationality, the extent of vertical integration, and size and age of firms, are, however, more seldom taken into account.

Other factors which might influence the export behaviour of individual affiliates are related to tendencies among TNCs when operating in several countries to assignate special markets to affiliates located outside these markets. In the overall strategic interest of the corporation, some individual affiliates' exports and imports may be restricted to a minimum. Generalizations of trade-performance of TNCs are thus hard to obtain without quite detailed knowledge of such variables as what kind of foreign production is undertaken by individual affiliates. For example, market-seeking affiliates are likely to import more than they export, especially in the cases of green-field investments, where a substantial amount of raw materials, components, parts, as well as other technological and managerial resources, are supplied, at least initially, by the parent-corporation. Resource-seeking affiliates, on the other hand, are normally net exporters, while rationalized manufacturers tend to be involved in both substantial imports and exports. Great variations in trade intensities are, of course, possible within these broad categories, according to variations in such variables as home- and host country policies in relation to FDI and trade, and the internationalization strategy of individual TNCs.

5.2.4.2 Comparison of exports between MOFAs and domestic firms in Sweden

Earlier attempts to estimate differences in export-performance among foreign and domestic firms in Sweden show varying results. Studies from the beginning of the 1970s (Samuelsson 1977) show that foreign TNCs exported more than a third (37%) of their production, which was found to be a higher share than among all Swedish companies. However, a more detailed analysis of the export-performance among foreign and domestic firms in the late 1970s, indicated that foreign TNCs were more export-intensive than domestic companies without foreign affiliates, but less export-intensive than Swedish TNCs (SOU 1982:15). Foreign TNCs in Sweden had an export-intensity, measured as the value of export compared to total sales, of 38 percent. In comparison, it was shown that domestic Swedish TNCs had an export-intensity of 62 percent while domestic firms without any foreign affiliates outside Sweden, had an export-intensity of 25 percent of total sales.

More recent indications of export intensities among foreign and domestic firms in Sweden show that, in 1988, foreign affiliates were exporting 44 percent of total sales, or almost the same figure as for all manufacturing firms in Sweden. Although foreign affiliates seemed to be less export-intensive compared to a very small group of the most internationalized Swedish TNCs, the foreign affiliates were just as export-intensive as all other Swedish TNCs, and substantially more export-intensive than domestic firms without foreign production (Industridepartementet 1991).

In Table 5.17 below, the findings in the present study of export performance by MOFAs, are compared to the most recently available official estimates of export-

Table 5.17 *Official estimates of export-performance among domestic firms and foreign owned affiliates in Sweden 1991, by industry (ISIC 2-digit level) compared to results from export performance of MOFAs in the present study*

	Exports in goods and services by firms with more than 50 employees				
	Share of total Swedish exports[a]		Export-intensity[b]		Export-intensity
Industry	Domestic firms	Foreign-owned affiliates	Domestic firms	Foreign-owned affiliates	of MOFAs in the present study[c]
Food	57	44	3	13	18
Textiles	71	29	17	41	72
Wood-products	96	4	15	29	65
Pulp and paper	86	14	38	58	46
Chemical	68	32	38	41	50
Non-metallic minerals	39	62	5	19	27
Iron and steel	76	24	44	52	73
Engineering	78	22	45	48	66
TOTAL	78	22	33	43	53

Note: a) Share of total value of Swedish exports of goods and services in firms with more than 50 employees; b) Exports in total sales; c) Share of exports in total manufactured sales

Source: NUTEK (1994), and survey data by the author

performance among domestic and foreign-owned affiliates operating in different industries in Sweden. Notice that the official figures relate to export-intensity, as well as the total share of Swedish exports in the year 1991, and include sales of goods as well as services in firms with more than 50 employees. According to these estimates, foreign-owned affiliates were, in 1991, responsible for 22 percent of total Swedish exports in goods and services, and especially important in the non-metallic mineral-, and food industries, with 62 percent and 44 percent, respectively of total Swedish exports. Lowest shares of total exports accounted for by foreign affiliates were found in the wood-products industry (4%) and in the pulp- and paper industry (14%).

According to the official estimates, in terms of export-intensity, foreign-owned affiliates seem to be more export-intensive as a whole, compared to all domestic firms, as 43 percent of total sales of goods and services are exported among foreign-owned affiliates, compared to 33 percent among domestic firms. Significantly higher proportions of exports among the foreign-owned affiliates, can be found in the textiles-, wood-products-, pulp-and paper- and non-metallic mineral industries. In the pulp- and paper and iron- and steel industries more than half of total sales are exported, while the foreign-owned affiliates operating in the engineering industry exported almost half of total sales.

Compared to these official figures, the findings in the present study of manufactured exports by MOFAs show that the tendency for foreign affiliates to be more export intensive, compared to domestic firms, is even more pronounced. This tendency can be identified in all industries, except in the pulp and paper industry. One of the reasons why the export intensity of MOFAs is even more pronounced in the present study compared to the official estimates presented in the Table, might be related to the fact that the official sources include exports of goods and services, and probably also resale of non-produced goods. As was seen above, resale of corporate products, are basically sold on the domestic market, which also probably applies to services. This might explain, at least partly, the difference between the two surveys of export intensities among foreign affiliates. Part of the explanation can, of course, also be found in the fact that the estimates relate to two different years.

Earlier estimates of exports by foreign affiliates in Sweden have shown that they seem to be more export-oriented compared to all domestic firms, except for a small group of the most internationalized Swedish TNCs. Recent findings of all Swedish TNCs show that 56 percent of their Swedish output was exported in 1990 (Andersson et.al 1996). Compared to these figures, it seems that MOFAs included in the present study are almost as export-orientated, exporting 53 percent of manufactured sales in 1993.

The general tendency whereby foreign affiliates are more export-oriented than domestic firms in Sweden is also supported by a study of export activities of small and medium sized enterprises (SMEs) compared to small foreign-owned affiliates in Sweden (Ivarsson 1994). In this study the export intensities of smaller MOFAs, employing no more than 100 persons in 1993, was compared to what is found in

recent surveys of SMEs in Sweden in general, summarized in table 5.18. Despite variations in the size- and industry composition among the sample firms in these studies, some generalizations seem possible to make in relation to export-performance of SMEs. Firstly, the average export-intensity among SMEs in Sweden in the late 1980s and early 1990s has rarely exceeded 25 percent of total sales. Secondly, between one-fourth and two-thirds of SMEs seem to be home-market oriented with no foreign sales. Third, between 10 and 20 percent of the firms can be identified as export-intensive; having more than half of their sales generated by exports.

Another generalization to be made is that the export markets for the SMEs, compared to export markets of all firms in Sweden, seem to be more focused on the neighbouring Nordic market, and less on non-European markets. While some 20 percent of total Swedish exports in 1992 were aimed at the combined Nordic market of Denmark, Norway, and Finland, between 25 percent and 40 percent of the SMEs' exports were concentrated to this market, (SIND 1988, Håkansson 1989, Industridepartementet 1990, Braunerhjelm 1991, Bonnedahl 1991).

The available surveys (Lindmark 1982; 1989, Kaynak et.al 1987, Industridepartementet 1990, SIND 1990, Bonnedahl 1991, Boter-Holmqvist 1993), suggests that most export-intensive firms seem to be found in the wood-, paper and pulp-, and mechanical engineering industries, while low shares of exports by SMEs are to be found mainly in the food-, textiles-, and non-metallic mineral industries. Estimates of export intensities among SMEs in the electronic industry vary.

Analysing differences between domestic SMEs and foreign affiliates in the propensity to export, it was found that the smaller MOFAs exported 40 percent of total sales of manufactured output in 1993. If we compare this figure with estimates on average export intensities among domestic SMEs presented above, the foreign affiliates seem to be substantially more export-orientated. The average export-intensity among domestic SMEs is generally estimated at some 20 percent of total sales, or only about half of the export-intensity found among comparable foreign affiliates. Studying the proportion of firms which can be identified as non-exporters among the domestic SMEs, these were found to be somewhere between one fourth and one third of the surveyed firms, compared to 17 percent among the smaller MOFAs. Focusing on the proportion of firms which can be identified as export-intensive, i.e., those firms exporting most of their output, it can be seen that only 10-20 percent of the domestic SMEs can be categorized as export-intensive, compared to one third among the affiliates.

Summarizing the findings from this comparative study on export-performance between smaller MOFAs and corresponding domestic SMEs, it was found that, on average, the foreign-owned affiliates seem to be substantially more export-intensive, and have proportionally fewer non-exporting firms and proportionally more export-intensive firms, than domestic SMEs. If this higher propensity among foreign-owned firms to export is attributable to a tendency to concentrate on export-intensive industries is, however, more difficult to analyse, because of the fragmentary

Table 5.18 *Empirical findings in studies of export-intensity among Swedish SMEs.*

Exports/total sales in sample firms	None-exporting firms	Export intensive: firms (>50% exports)	Number of firms investigated	Year	Source
na	50% (<10% exp)	11%	86[a]	1984	Kaynak et al.(1987)
22%	na	na	123[b]	late 1980's	Håkansson (1989)
na	85 %	na	All SMEs	1987	SHIO (1987)
27%	69%	12% (>40% exp)	378[c]	1988	SIND (1990)
19-25%	na	na	44[d]	1988-90	Braunerhjelm (1991)
22%	na	na	Family-owned SMEs[e]	1988	Industridepartementet (1990)
na	63%	11%	70[f]	1989	Lindmark (1989)
na	46%	13%	112[g]	1989	Lindmark (1989)
na	64%	11%	109[h]	1990	Burholm-Eriksson (1990)
na	40%	14%	101[i]	1990	Bonnedahl (1991)
na	41% (0-25% exp)	46%	81[j]	1990	Lee and Ackelsberg (1993)
39%	42%	12%	70[k]	1992	Markgren (1993)
19	56%(<10% exp)	18%(>40% exp)	337[l]	1991	Boter-Holmqvist (1993)
21	53%(>10% exp)	20%(>40% exp)	285[l]	1992	Boter-Holmqvist (1993)

a) Mainly resource-based industries,(wood and forestry), but also non-manufacturing. Size: 5-200 employees.
b) 123 manufacturing firms, different industries, of which 89 firms with 20-100 employees
c) Manufacturing firms; wood-, plastics-, metal-, non-electric and electric machinery-industries, Size; 10-200 employees
d) Engineering industry, Size: 20-200 employees.
e) All family-owned SMEs in the manufacturing industry, size 20-199 employees
f) Manufacturing firms in the city of Umeå, in northern Sweden
g) Manufacturing firms in the city of Skellefteå, in northern Sweden
h) Manufacturing firms in the city of Örnsköldsvik in northern Sweden
i) Manufacturing firms in the engineering and wood-products industries, Size 10-200 employees.
j) Manufacturing and non manufacturing firms, firm size based on annual sales ranging from MSEK>1000 to<5000
k) Manufacturing firms, of which 26 firms with 10-19 employees, 37 firms with 20-499 employees, region of Uppsala län.
l) Firms < 499 employees (of which 80% with less than 100 employees) in the textile-, food-, furniture-, electronic-, and mechanical engineering industries

information on export-intensities among domestic SMEs. Based on available data on export intensities among domestic SMEs and foreign affiliates from a number of industries, it can, however, be tentatively stated that the smaller foreign affiliates seem to be more export-orientated than corresponding domestic firms in most of the industries (ISIC 2-digit level). The only indication of a somewhat higher proportion of export-intensive firms among domestic SMEs, found in the food-, textiles-, and pulp and paper industries, can be a result of differences in the way these figures were estimated in the original surveys. Taking into consideration that the estimates of domestic SMEs in these studies includes larger firms, and that the definition of export-intensive firms is less strict than among foreign affiliates, the difference would probably be marginal.

A comparative analysis of the geographical scope of export markets between domestic SMEs and the smaller foreign affiliates does not indicate any systematic differences in the proportion of exports going to Nordic, European and non-European markets. These comparisons are, however, problematic, given the scarce and inconsistent findings in surveys on the sales-markets among domestic SMEs.

5.3 Purchasing of Material Inputs

5.3.1 Domestic purchasing and imports

In this section we continue the analysis of integrated international production by presenting empirical findings on MOFAs' purchasing patterns of material inputs. This section presents empirical findings related to the third research questions, set out in section 4.6, above, i.e *to what extent are MOFAs purchasing material inputs from suppliers in Sweden, alternatively importing them from suppliers abroad?*

Contrary to many other investigations, in the present study it is possible to distinguish material inputs used by the affiliates in their production process, from purchases of finished products which are distributed to external customers without any processing by the affiliates in Sweden. This facilitates an in-depth analysis of the share of total purchases of material inputs from suppliers located in the Swedish host market, respectively from suppliers located in seven different import markets: the Nordic market (except Sweden), Western Europe, Russia/East Europe, North America, Latin America, Japan/South East Asia and Rest of World. Before presenting the empirical findings of import-performance of MOFAs, it should be noticed that this is not affected by import-regulating policies, since these type of regulations are not applied by the Swedish government in relation to foreign-owned TNCs.

Turning to the empirical results, in Table 5.19, it can be found that almost half of the value of materials, components and other material inputs used by MOFAs in their manufacturing operation are purchased from suppliers located in the Swedish host market. Another 13 percent of material inputs are purchased in the neighbouring

Table 5.19 *Percent purchases of material inputs in different markets by MOFAs located in Sweden 1993*

	Sweden	Nordic excl. Swe	Western Europe	Russia/ East Eur.	North Am.	Latin Am.	Jap/ SE Asia	Rest of World	Total purchases Total	MSEK	N
TOTAL	45	13	33	2	3	1	2	2	100	30348	296

Source: Survey data by the author

Nordic market, while one third of purchases originate from suppliers in Western Europe. Only marginal purchases from suppliers located outside Western Europe can be distinguished, even if measurable shares can be found in all regions.

Only very few MOFAs (5%) purchase their material inputs exclusively from suppliers in Sweden, see Table 5.20. Around 30 percent of the affiliates purchase three quarters of all materials from suppliers located in Sweden. An equally large share of the affiliates are very import-intensive, purchasing three quarters or more of materials from suppliers outside Sweden.

Table 5.20 *Percent imports of total purchases of material inputs by MOFAs located in Sweden 1993. Percent of firms.*

	0%	1-10%	11-25%	26-50%	51-75%	76-100%	Total	N
TOTAL	5	8	16	25	18	29	100	296

Source: Survey data by the author

Analysing the geographical distribution of material purchasing in more detail, Table 5.21 shows that German and Norwegian-based affiliates purchase smallest shares from suppliers in the local market, while MOFAs based in UK, USA, Denmark and the

Table 5.21 *Percent purchases of material inputs in different markets by MOFAs located in Sweden 1993, by home-country.*

Home-country	Sweden	Nordic excl. Swe	Western Europe	Russia/ East Europe	North America	Latin America	Japan/ SE Asia	Rest of world	Total	N
Denmark	50	16	33	0	0	0	1	0	100	15
Finland	48	16	32	1	1	0	2	0	100	72
Norway	37	18	29	7	1	2	0	8	100	39
France	41	6	46	1	4	0	1	1	100	19
Germany	35	5	43	1	13	1	1	0	100	29
The Netherlands	50	8	29	0	4	0	9	0	100	23
Switzerland	44	23	17	0	1	7	0	9	100	20
UK	52	5	39	2	1	0	1	1	100	30
USA	50	11	34	1	3	0	1	0	100	33
Other	41	2	51	0	5	0	0	1	100	16
TOTAL	45	13	33	2	3	1	2	2	100	296

Source: Survey data by the author

Table 5.22 *Percent purchases of material inputs in different markets, by MOFAs located in Sweden 1993, by industry.*

Industry	Sweden	Nordic excl. Swe	Western Europe	Russia/ East Europe	North America	Latin America	Japan/ SE Asia	Rest of world	Total	N
Food products	53	13	21	0	1	3	4	4	100	17
Textiles, wearing apparel	16	31	49	0	2	0	0	1	100	11
Wood products, Furniture	89	5	3	2	1	0	0	0	100	9
Pulp and paper	72	20	7	0	1	0	0	0	100	13
Printing, Publishing	71	25	4	0	0	0	0	0	100	4
Industrial chemicals	27	16	41	6	2	1	0	6	100	28
Other chemical products	28	7	63	1	1	0	1	0	100	25
Petroleum, Coal products, Rubber products	16	8	67	8	1	0	1	0	100	4
Plastic products	52	18	29	0	0	0	0	0	100	12
Pottery, Glass, Non-metal products	59	8	31	1	1	0	0	0	100	21
Iron and steel-, Non-ferrous metals	32	9	55	1	3	0	1	0	100	14
Fabricated metal products excl. machinery	58	14	26	0	1	0	1	0	100	39
Machinery, except electrical	53	13	29	1	1	0	1	0	100	48
Electrical machinery and apparatus	40	9	32	0	7	0	12	0	100	19
Transport equipment	56	16	27	0	0	0	0	0	100	14
Professional goods	42	3	22	0	30	2	2	0	100	9
Other manufacturing industries	47	11	26	1	8	0	6	0	100	9
TOTAL	45	13	33	2	3	1	2	2	100	96

Source: Survey data by the author

Netherlands are most dependent on local suppliers. With the exception of MOFAs based in France, Germany and "Other" countries, which mainly use suppliers located in Western Europe, the local market in Sweden seems to be the main source for material purchases.

Industry specific variations in the extent of local market sourcing of material inputs can be identified in Table 5.22. In total, the dependency on local sourcing seems to be especially high among MOFAs operating in the printing-, plastics, food-, pottery-, and other manufacturing industries, where around three quarters, or more, of total purchasing of input goods originate from suppliers in Sweden. By contrast, MOFAs operating in the professional goods-, non-electrical machinery-, iron and steel-, and textile industries rely heavily on input goods which are imported. Among affiliates operating in these import-intensive industries only around one quarter or less of purchases originate from suppliers in Sweden. Instead, substantial shares (around 30%) of materials are imported from suppliers located in non-European markets.

5.3.2 Intra-firm and arm's-length purchasing of material inputs

In this section we turn to findings related to the extent that MOFAs are vertically integrated through intra-firm purchasing of material inputs from sister- and parent-firms. Since it has been possible to distinguish input goods used by MOFAs in their production process, from products for resale, the findings are believed to give a realistic account of the extent of backward vertical integration of MOFAs. The findings are related to the fourth research question, set out in section 4.6, above, i.e: *to what extent are MOFAs vertically integrated through intra-firm purchases of material inputs?*

Intra-firm purchases as a share of total purchases of material inputs are estimated to 18 percent, see Table 5.23. The share of imports of material inputs that are organized as intra-firm imports are substantially higher, or 29 percent.

Table 5.23 *Intra-firm purchases of total purchases of material inputs, and, intra-firm imports of total imports of material inputs, by MOFAs located in Sweden 1993. Percent*

	Intra-firm purchases of total purchases of material inputs	Intra-firm imports of total imports of material inputs	N
TOTAL	18	29	296

Source: Survey data by the author

However, the organization of intra-firm purchasing of material inputs from corporate firms abroad is not found among all MOFAs, see Table 5.24. In fact, more than half of all affiliates (52%) are not involved in any intra-firm import, while another 7 percent are only marginally supplied by materials, parts or components from parent- or sister-

Table 5.24 *Percent intra-firm imports of total imports of material inputs, by MOFAs located in Sweden 1993. Percent of firms.*

	0%	1-10%	11-25%	26-50%	51-75%	76-100%	Total	N
TOTAL	52	7	8	11	11	11	100	296

Source: Survey data by the author

firms abroad. By contrast, we can also see that around one fifth of all affiliates import most of their material inputs from corporate firms.

According to Table 5.25, the highest shares of intra-firm purchases in total purchases, as well as the highest shares of imports that are internalized, can be found in German and Swiss MOFAs, while US and Dutch affiliates have least intra-firm purchases.

Table 5.25 *Intra-firm purchasing of total purchasing of material inputs, and intra-firm imports of total imports of material inputs, by MOFAs located in Sweden 1993, by home country. Percent*

Home-country	Intra-firm purchasing of total purchasing of material inputs	Intra-firm imports of total imports of material inputs	N
Denmark	16	31	15
Finland	22	37	72
Norway	16	23	39
France	16	28	19
Germany	27	38	29
The Netherlands	6	8	23
Switzerland	26	46	20
UK	20	24	30
USA	10	19	33
Other	10	16	16
TOTAL	18	29	296

Source: Survey data by the author

Industry-specific variations in the degree that MOFAs are supplied by parent- or sister-firms are illustrated in Table 5.26. Here, it can be seen that substantial amounts of intra-firm purchasing are found among MOFAs operating in the iron and steel-, textiles-, and other chemical industries, ranging between 28 percent and 39 percent of total purchases. In these industries the share of imports that are internalized is also high, ranging between 36 percent in the textile industry to 55 percent in the iron and steel industry. By contrast, the share of purchases that are internalized among affiliates in the pulp and paper-, wood products-, printing-, and electrical machinery and non electrical machinery industries is the lowest, or less than 10 percent. In these industries we also find the lowest shares of intra-firm imports in total imports.

Table 5.26 *Intra-firm purchasing of total purchasing of material inputs, and intra-firm imports of total imports of material inputs, by MOFAs located in Sweden 1993, by industry. Percent.*

Industry	Intra-firm purchasing by total purchasing of material inputs	Intra-firm imports by total imports of material inputs	N
Food products	15	28	17
Textiles, wearing apparel	31	36	11
Wood products, Furniture	6	8	9
Pulp and paper	6	23	13
Printing, Publishing	8	27	4
Industrial chemicals	28	34	28
Other chemical products	13	18	25
Petroleum, Coal products, Rubber products	12	14	4
Plastic products	24	48	12
Pottery, Glass, Non-metal products	24	33	21
Iron and steel-, Non-ferrous metals	39	55	14
Fabricated metal products excl. machinery	12	27	39
Machinery, except electrical	9	14	48
Electrical machinery and apparatus	8	13	19
Transport equipment	10	21	14
Professional goods	24	36	9
Other manufacturing industries	11	21	9
TOTAL	18	29	296

Source: Survey data by the author

Internal supply lines, consisting of materials, parts, and components, purchased from parent- or sister-firms, are mainly Intra-European, as can be seen in Table 5.27. Except among MOFAs based in Norway, Switzerland and the US, the majority of intra-firm purchasing originates in parent- or sister-firms located in Western Europe.

Table 5.27 *Intra-firm purchases of material inputs in different markets by MOFAs located in Sweden 1993, by home-country. Percent*

Home-country	Sweden	Nordic excl Swe	Western Europe	Russia/ East Europe	North America	Latin America	Japan/ SE Asia	Rest of world	Total	N
Denmark	3	47	50	0	0	0	0	0	100	15
Finland	12	39	49	0	0	0	0	0	100	72
Norway	9	90	0	0	0	0	0	0	100	39
France	0	5	95	0	0	0	0	0	100	19
Germany	7	1	63	0	29	0	0	0	100	29
The Netherlands	35	0	65	0	0	0	0	0	100	23
Switzerland	2	65	17	0	0	0	0	16	100	20
UK	41	1	57	0	0	0	0	0	100	30
USA	3	67	15	0	14	1	0	0	100	33
Other	2	0	96	0	0	0	2	0	100	16
TOTAL	11	38	44	0	5	0	0	1	100	296

Source: Survey data by the author

Among Norwegian, Swiss and US MOFAs, intra-firm supplies of material inputs are basically intra-Nordic. Large shares of intra-firm purchases between sister affiliates in Sweden can be found among MOFAs based in the Netherlands and the UK.

Although most intra-firm purchasing seems to be intra-European, significant shares of material inputs are also supplied by parent- or sister-firms located outside Europe. This is especially evident among German affiliates, where around 30 percent of intra-firm deliveries of input goods are supplied by sister affiliates located in North America. Also among US based MOFAs, a sizeable share (14%) originate from North America. Finally, intra-firm purchases of material inputs among Swiss MOFAs involve sister affiliates located in Rest of World.

5.3.3 Comparison of import-performance between MOFAs and domestic firms

Above, in section 4.3, foreign affiliates were suggested as often importing a larger share of inputs, than domestic firms. The extent in which foreign affiliates behave differently from indigenous firms in their procurement decisions seems to be for mainly two reasons. Firstly, it may be that the foreign affiliates, or their parent-corporation, have better information about worldwide prices and quality of various inputs, and that they are able to acquire these on more favourable terms. The second situation where foreign affiliates may exhibit substantially different procurement patterns, is when the parent-corporation chooses to operate distinct procurement strategies, forcing the affiliates to coordinate their purchases in line with corporate directives. In this section an attempt is made to analyse the extent in which MOFAs and domestic firms purchase inputs from suppliers in Sweden, alternatively import them from suppliers abroad. Unfortunately, it has not been possible to find information on purchasing behaviour among Swedish manufacturing firms in general. However, some recent studies on the purchasing behaviour of domestic small and medium sized enterprises (SMEs) is available. Below, these are compared with the purchasing behaviour of MOFAs of comparable size, including 148 affiliates, employing no more than 100 persons in 1993. A more detailed analysis is provided in Ivarsson (1994).

A summary of available surveys on procurement and imports of material inputs by SMEs in Sweden is presented in Table 5.28. Most of these surveys concern import-performance among SMEs prior to the beginning of the 1980s, although some surveys provide more up-to date estimates. Generalizations on the significance of imports and SMEs in Sweden are problematic, primarily because of there being very few surveys available on the topic in general. However, the empirical findings available in up-to-date surveys (Håkansson 1989, Markgren 1993, and Boter-Holmqvist 1993) on import-performance and SMEs in Sweden suggest at least some tentative generalizations: firstly, that the import-intensity in smaller and medium-sized firms seems to be increasing and that between 20 and 40 percent of total inputs are purchased from suppliers outside Sweden.

Table 5.28 *Imports of material inputs by SMEs in Sweden found in previous surveys*

Percent imports out of total procurements in sample firms	Number of firms investigated	Year	Source
24%	engineering industry[a]	1957	SIND (1985)
35%	engineering industry[b]	1975	SIND (1985)
20%	723[c]	mid 1970's	Fredriksson Lindmark (1976)
45%	22[d]	1981	Industridepartementet et al (1981)
41%	260[e]	1981	Carlsson (1981)
63%	engineering industry[f]	1979	SNS (1982)
30-85%	engineering industry[g]	1980	SIND (1982)
27%	230[h]	1980	SIND (1982)
19%	123[i]	late 1980's	Håkansson (1989)
40% of firms no imports, 10% of firms >50% imports	70[j]	late 1980's	Markgren (1993)
36%	337[k]	1991	Boter-Holmqvist (1993)
37%	285[k]	1992	Boter-Holmqvist (1993)

a) all firms
b) all firms
c) manufacturing firms, of which 80 % SMEs, <100 employees
d) a sample of bigger and smaller manufacturing firms
e) bigger and smaller manufacturing firms, of which 80 firms in the engineering industry
f) a sample of 80 groups of components, approximately 1/3 of total imports, in the engineering industry
g) Following materials investigated: castings, forging steel, aluminium, hydraulics/pneumatics, electronics, industrial rubber, plastics, metal-working machines
h) SMEs, 20-200 employees in the engineering industry
i) 123 manufacturing firms, different industries, of which 89 firms with 20-100 employees
j) Manufacturing firms, of which 26 with 10-19 employees, 37 firms with 20-499 employees, region of Uppsala län.
k) Firms <499 employees (of which 80% <100 employees), in the textile-, food-, furniture, electronics, and mechanical engineering industries.

Secondly, substantial industry variations are identified in terms of imports. Relatively high import shares have been found in firms operating in the electronics-, chemical, and textile industries, while relatively low shares of imports have been found in food-, wood-, furniture-, non-metallic minerals-, and mechanical engineering industries. The most important supply markets for imported inputs are mainly to be found in Western Europe, especially in Germany and the UK, and to a lesser degree in the Nordic countries. Purchase of inputs from non-European countries seem to be relatively insignificant, seldom reaching 10 percent of total purchasing.

Comparative studies on the import-performance of domestic SMEs and foreign affiliates are problematic, mainly, because very few up-to-date estimates on import intensities among domestic SMEs exist. The only available information on import behaviour of domestic SMEs in the late 1980s and beginning of the 1990s is provided in three studies, presented in Table 5.28 above, suggesting that domestic SMEs import between 20-40 percent of all inputs. Compared to this, smaller MOFAs located in Sweden in 1993 purchase relatively less from suppliers in Sweden, since 60 percent of their total purchases of material inputs were imported in 1993.

A relatively lower degree of importing by domestic SMEs is also indicated by analysing the proportion of firms which can be identified as non-importers, respectively import-intensive firms (importing more than half of total purchases of inputs), see table 5.29. Here it seems, that the share of non-importing firms among MOFAs is lower than corresponding proportions for domestic SMEs, as indicated in studies by Boter-Holmqvist (1993) and Markgren (1993). The proportion of domestic SMEs which are non-importers, ranges between 13 and 39 percent between both surveys, while the share of affiliates which are non-importers is only 7 percent. Furthermore as can also be seen, 52 percent of MOFAs can be identified as import-intensive, i.e. importing more than half the total purchases of material inputs, compared to the much lower share of 12 percent among domestic SMEs, found in the only available study.

Table 5.29 *Percent non-importing and import-intensive firms among domestic SMEs and smaller MOFAs located in Sweden, late 1980s-early 1990s*

	Estimates in various studies on Swedish SMEs		Smaller foreign owned affiliates
	Boter-Holmqvist 1992[a]	Markgren late 1980s[b]	1993
Non-importing firms	13	39	7
Import-intensive firms	-	12	52

a) 285 firms, size <499 employees, of which 80% <100 employees, in the textile-, food-, furniture-, electronics-, mechanical engineering industries b) 70 manufacturing firms, different industries, of which 26 firms with 10-19 employees, 37 firms with 20-499 employees, region of Uppsala län.

Source: Boter-Holmqvist (1993) Markgren (1993), Ivarsson (1994)

Some indications on import intensities among SMEs in different industries are provided in a study by Boter-Holmqvist (1993), who estimated the average import-intensity among SMEs in five different industries: the food-, textiles-, furniture-, electronics-, and mechanical engineering industries. Unfortunately the industry classifications used in the Boter-Holmqvist study are not comparable to those applied in the present study. However, by using an industry classification based on a ISIC 2-digit level, some broad indications may be obtained, see table 5.30 Higher import intensities among foreign affiliates are indicated in all but the wood-products industry. However, the higher import-intensity among domestic SMEs in the wood-products industry may be caused by the fact that the estimates of import propensities among domestic SMEs include a number of bigger firms, which may be generally more import-intensive than the smaller firms included in the study on foreign affiliates.

Table 5.30 *Average import intensities (percent imports out of total purchases of material inputs) in four different industries among domestic SMEs and smaller foreign-owned affiliates in Sweden, early 1990s*

Industry	Swedish SMEs[a] 1992	Smaller foreign-owned affiliates 1993
Textiles	63	73
Food	23	87
Wood products	27	18
Engineering	27-41	45

a) 285 firms, size: <499 employees (of which 80% <100 employees), in the textile-, food-, furniture, electronics, mechanical engineering industries.

Source: Boter-Holmqvist (1993) p.18 and Ivarsson (1994)

The conclusion of this comparison of purchasing behaviour between domestic SMEs and MOFAs of comparable size is that available information suggest that MOFAs seem, on average, to import a substantially higher proportion of material inputs than corresponding domestic SMEs. While the affiliates were importing on average some 60 percent of material inputs at the beginning of the 1990s, import propensities of 40 percent or lower are found in up-to-date surveys on imports by domestic SMEs. The relatively higher degree of imports by the affiliates is furthermore indicated by proportionally fewer non-importers and more import-intensive firms among the affiliates, compared to corresponding domestic SMEs. Higher average import propensities among foreign affiliates are also indicated in three out of four industries (at the 2-digit level) where information is available. Higher shares of imports of material inputs among foreign affiliates are found in the textile, food and engineering industries, while domestic SMEs seem to import a higher proportion of inputs in the wood products industry. However, the higher import propensity among domestic SMEs in the wood products industry may be attributable to the fact that this study included a number of bigger firms, normally more import-intensive than the smaller firms included in the study on foreign affiliates.

5.4 Functional integration of other parts of the value-chain

5.4.1 Introduction

In the subsequent three sections, the discussion of integrated international production continues with an examination of the extent in which MOFAs in Sweden functionally integrate other parts of their value chain, with those of parent- and sister-affiliates, except those related to exports and intra-firm trade discussed above. Three different forms of corporate integration will be focused upon. Firstly, an analysis of the extent in which MOFAs coordinate different functional activities with those of parent-and sister-firms is presented. Thereafter, the discussion look at how far MOFAs are involved in inter-firm and intra-corporate cooperation when generating technological competence. The third indication of functional integration show findings on the extent in which MOFAs operate as competence centres on behalf of parent- or sister-firms.

5.4.2 Intra-corporate coordination of different functional activities

As was discussed in chapter 4 above, foreign-located affiliates of TNCs which operate with a multi-domestic strategy are often found to be relatively autonomous from parent-firms. More recently, many affiliates of TNCs operating with an integrated international strategy, have started to coordinate different parts of their value chain with other corporate firms, in order to achieve economies of scale and scope. In this section we aim to analyse the extent to which MOFAs in Sweden coordinate different parts of their value chains with parent- or sister-firms abroad. The findings of the present section relate to the fifth research question, set out in section 4.6, above, i.e*: to what extent are different functional activities of MOFAs coordinated with parent- and sister-firms?*

The extent of intra-corporate coordination has been examined by asking the local managers of MOFAs in Sweden to indicate which, of eleven functional activities, they independently are responsible for, alternatively, coordinate, in part or completely, with parent- or sister-firms abroad. The term "coordination" is applied to measure the extent of integration since it has a connotation of long-term commitments, including some organizational adoption, rather than ad-hoc solutions on a short term basis. What should be clear is that this method only shows the number of MOFAs indicating a level of coordination. The extent of this coordination, however, is not specified. Figure 5.1 shows that a majority, or around three quarters, of MOFAs indicate that the R&D and finance functions are coordinated with parent- or sister-firms. With the exception of these two functions, most affiliates do not seem to coordinate their functional activities with parent- or sister-firms. While the marketing function also tends to be coordinated by a relatively large number of MOFAs (43%), all other parts

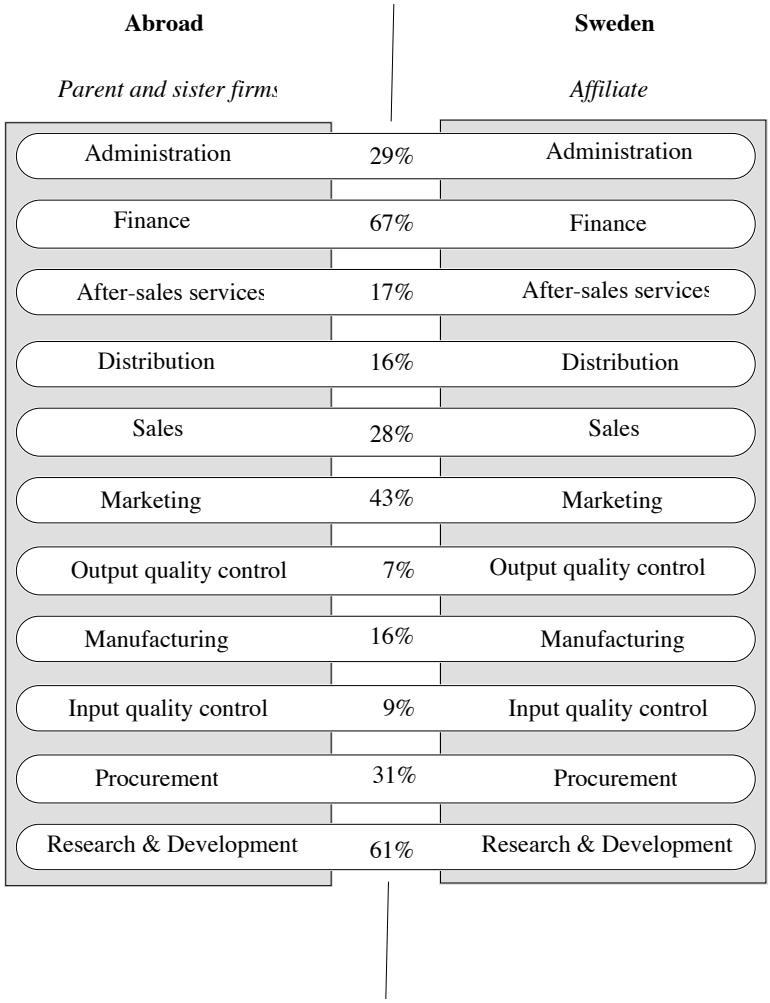


Figure 5.1 *Percent of MOFAs located in Sweden 1993 indicating intra-corporate coordination in different parts of the value chain*

Source: Survey data by the author

of the value chain are coordinated by only around one third, or less, of MOFAs. The lowest level of coordination can be found in relation to input and output quality control, production, distribution and after-sale services. Eight percent of affiliates say that no coordination of any functional activity is performed, meaning that they operate independently from the parent-organization.

Being part of a TNC allows for resource transfers between and among parent-firms and their affiliates. Relatively little data on intra-firm resource flows exist, but those that do exist focus basically on technology transfer, such as R&D-spending and patent fees, indicating a slow trend towards greater functional integration of TNC activities (UNCTD-DTCI 1995). In order to analyse what type of company resources that are transferred between parent- and sister-firms abroad to the affiliates in Sweden, the local managers in Sweden have been asked to indicate, among eight broad areas, the three most important resources which are received from other parts of their parent-corporations. What should be clear is that the figures below indicate the

relative importance local managers give to these different types of resources compared with each other. The absolute importance is not revealed.

Table 5.31 shows that most affiliates (57%) indicate that financial resources are amongst the most important. A somewhat smaller proportion, (around 45%), of MOFAs suggest that access to product technology and an international marketing organization are among the most important. The other types of specified resources are indicated as being among the most important by fewer affiliates. Of the least relative importance seem to be resources related to an international procurement organization, process technology and the possibility of achieving scale economies in production.

Table 5.31 *Type of intra-corporate received resources cited as being among the three most important in MOFAs located in Sweden 1993. Percent*

	Product technology	Process technology	Other type of know-how	International marketing organization	International procurement organization	Corporate goodwill	Scale-economies	Finance	N
TOTAL	47	25	36	45	22	33	21	57	296

Note: Total number of most important sources cited may not sum up to total number of firms, because some firms cited more or less than three sources as most important.

Source: Survey data by the author

5.4.3 Inter-firm and intra corporate technological cooperation

As was discussed above (section 4.6), an important aspect of integrated international production can be found in the fact that TNCs not only generate new or improve existing technological skills through their own R&D-activities, but also by establishing collaborative relationships with external firms, e.g. suppliers, customers, universities and independent R&D institutions located in various countries, in order to tap foreign located competencies and capabilities. The second indication of functional integration between MOFAs and other parts of parent-corporations focuses on the importance of cooperation with corporate firms, alternatively, external firms, in order to generate technological competence. This aspect of international integrated production relates to the sixth research question, set out in section 4.6, above, i.e.: *to what extent are MOFAs involved in cooperation with parent- and sister-firms, alternatively, external firms (e.g. suppliers and customers) in order to generate technological competence?*

In order to analyse as to the extent in which MOFAs located in Sweden are involved in intra-corporate technological cooperation, as well as cooperation with external firms, local managers have been asked to indicate their degree of involvement in "organized and lasting technological cooperation" with corporate firms (parent- and sister-firms), external firms (suppliers and customers) and R&D institutions. Each

of these three categories of cooperative partners are also sub-defined, as to whether they are located in Sweden or abroad, in order to identify if spatial proximity has any impact on the degree of technological cooperation, resulting in a greater possibility of technological relationships with cooperative partners located in Sweden compared to abroad. The extent of cooperation is revealed by using an ordinal scale, where the local managers has been asked to estimate the existence of "organized and lasting technological cooperation" with each category of partners, by using a value ranging between "0" if they perceive it as "non-existent", and "4" if they perceive this to be organized "to a very large extent". Technological cooperation relates to product as well as process technology.

Table 5.32 shows the result. Firstly, focusing on the proportion of affiliates claiming that they are involved in at least some technological cooperation, (indicating "1" or higher), we find that as many as 80 percent are involved in technological cooperation with corporate firms abroad, while almost 30 percent indicate that they have technological cooperation with sister-affiliates in Sweden. We find also that three quarters claim that they are involved in inter-firm technological collaborations with suppliers/customers located in Sweden, while a somewhat smaller number suggests that this is so in regards to external firms abroad. In terms of technological cooperation with R&D institutions, 45 percent of affiliates claim that they are involved in cooperation with R&D institutions located in Sweden, while a substantially smaller proportion claim that R&D institutions abroad are involved.

A rather larger importance can probably be given to the figures showing the share of affiliates claiming that they are involved in "a large" or "very large" extent of technological cooperation (taking the value of "3" or "4" on the ordinal scale), since this probably best reflects the extent in which the affiliates' cooperation is of any substance. As can be seen, around 40 percent of affiliates claim that they are involved in a substantial amount of cooperation with corporate firms abroad, while around half as many, or 18 percent, are engaged in extensive cooperation with suppliers/customers located in Sweden. All other categories of cooperative partners seem to be of less importance in terms of extensive cooperation.

Table 5.32 *MOFAs located in Sweden 1993 indicating organized technological cooperation with corporate firms, external firms (suppliers/customers) and R&D institutions. Percent*

	Corporate firms in Sweden	Corporate firms abroad	External firms in Sweden	External firms abroad	R&D insti-tutions in Sweden	R&D insti-tutions abroad
MOFAs indicating at least some technological cooperation	28	81	75	59	45	18
MOFAs indicating "a large" or "very large" extent of technological cooperation	10	41	18	9	4	2

Source: Survey data by the author

Although the findings above gave some indications as to the extent in which MOFAs in Sweden are involved in inter and intra-firm technological cooperation with different types of partners, they say little of the relative importance these sources have as generators of technological competencies. In order to examine which sources are most important for generating technological competencies among the affiliates, local managers were asked to suggest, among seven specified sources, the three most important for their affiliates' technological competence, by using the value of "1" for the most important, "2" for the second most important and "3" for the third most important source. As can be seen in Table 5.33, a great majority (72%) of MOFAs claim that their technological competence is principally generated by themselves, internally. Around one fifth indicate that other corporate firms are the most important source for generating their technological competence. Only very few MOFAs claim external firms and R&D institutions in Sweden or abroad as being the main sources for generating technological competence.

Table 5.33 *Sources of technological competence cited as most important by MOFAs located in Sweden 1993. Percent.*

	Internally generated competence	Corporate firms in Sweden	Corporate firms abroad	External firms in Sweden	External firms abroad	R&D institutions in Sweden	R&D institutions abroad	N
TOTAL	72	2	18	5	1	1	1	296

Note: Total number of most important sources cited may not sum up to total number of firms, because some firms cited more than one source as most important, or, that no most important source was cited.
Corporate firms = parent- and sister-firms; External firms = suppliers and customers

Source: Survey data by the author

Finally, if we only focus on which cooperative partner, is perceived by the local managers in MOFAs as the most important source for generating their technological competencies, we find in Table 5.34, that most affiliates (54%) indicate that corporate firms abroad are the main partner for generating technological competence.

Table 5.34 *The relative importance of cooperation with external firms compared to corporate firms as a source for generating technology competence, among MOFAs located in Sweden 1993. Percent.*

	Cooperation with external firms in Sweden more important	Cooperation with external firms abroad more important	Cooperation with corporate firms in Sweden more important	Cooperation with corporate firms abroad more important	N
TOTAL	27	6	7	54	296

Note: The balance is accounted for affiliates which indicated that external firms and corporate firms are equally important as technology generating sources. Corporate firms: Parent- and sister-firms; External firms: suppliers, customers, R&D institutions.

Source: Survey data by the author

If we add the share of affiliates suggesting that corporate firms in Sweden are the main source for generating technological competence, (7%), this means that around 60 percent of MOFAs claim corporate firms as being the most important. It is also interesting to notice that over one quarter of the affiliates claim that external firms in Sweden are the most important partners for generating technological competence. Cooperation with external firms abroad is indicated by relatively few affiliates as the most important technology generating partner.

5.4.4 Affiliates operating as competence centres

As was discussed in section 4.7, recent trends in the organization of TNCs show that in some companies, individual foreign-located affiliates operate as competence centres with responsibilities for a whole range of functions far beyond the need for the local host market. This suggests that many TNCs are taking the form of net-worked, and less hierarchical, organizations, where individual affiliates play an important strategic role, not only for activities in their host markets, but also on behalf of sister- and parent-firms. Below some indications of the extent that MOFAs located in Sweden operate with corporate responsibilities in various functional area are presented, related to the seventh research question, set out in section 4.6 above, i.e: *to what extent do MOFAs operate as competence centres, indicated by corporate responsibilities in different functional areas, on behalf of parent-and sister-firms?*

In order to analyse to what extent MOFAs in Sweden operate with corporate responsibilities, the local managers have been asked to indicate in which, of the specified functional areas below, if any, their affiliate has received corporate responsibilities on behalf of at least one parent- or sister-firms outside Sweden, and, if such responsibilities have been received, which countries these include. Based on this definition, Table 5.35 shows the share of MOFAs which have received corporate

Table 5.35 *Percent of MOFAs located in Sweden in 1993 which have received corporate responsibilities in different functional areas.*

Functional area	Percent of affiliates
R&D	7
Procurement	1
Input quality control	1
Production	4
Output quality control	1
Marketing	6
Sales	6
Distribution	1
After-sale services	2
Finance	3
Administration	3
General management (Division/Product management)	4
Affiliates which have received corporate responsibility in any functional area	23

Source: Survey data by the author

responsibilities in different functional areas. As can be seen, a total of 23 percent of MOFAs indicate that they have received corporate responsibilities in at least one of the specified functional areas. The functional areas in which the largest number of MOFAs claim that they have received responsibilities for other corporate firms outside Sweden, is above all related to the R&D, marketing and sales functions, indicated by 6-7 percent of MOFAs. Functional areas where almost no affiliates indicate that they have received corporate responsibilities include input and output quality control, procurement and distribution.

Table 5.36 *Geographical scope of corporate responsibilities among MOFAs located in Sweden 1993. Percent of MOFAs with corporate responsibilities.*

Nordic countries only	Rest of World[a]
30	70

a) may also include Nordic countries

Source: Survey data by the author

The geographical scope of the functional activities where MOFAs in Sweden have received corporate responsibilities is indicated in Table 5.36. What can be seen is that in 30 percent of MOFAs with corporate responsibilities, this includes operations in the Nordic countries only, while in 70 percent of the affiliates this responsibility also, or exclusively, involves operations outside the Nordic region.

6 A SUMMARY AND DISCUSSION OF GENERAL EMPIRICAL FINDINGS OF INTEGRATED INTERNATIONAL PRODUCTION

6.1 Introduction

In this chapter we will summarize and discuss the most important empirical findings from chapter 5. Section 6.2 summarizes the general empirical findings on integrated international production among MOFAs located in Sweden in 1993. Thereafter, in order to put these findings into a historical, as well as a contextual perspective an attempt is made, in section 6.3, to make some comparisons with a number of earlier findings on foreign-owned TNCs in Sweden (reviewed in chapter 3), as well as on foreign affiliates located in other comparable countries (reviewed in chapter 4). Through these comparisons, some tendencies as to the extent in which integrated international production among foreign manufacturing affiliates in Sweden has changed during the last decades, can be obtained. By looking at findings on affiliates located in other countries, some insight as to whether the findings of MOFAs in Sweden are specific is possible. Together, these findings facilitate comparisons with established TNC theory. As far as possible, the discussion will focus on those aspects of integrated international production which have been analysed throughout chapter 5, i.e: exports of manufactured output, intra-firm sales, purchasing of material inputs, intra-firm purchasing, coordination of different parts of the value chain, intra-corporate and inter-firm technological cooperation and affiliates operating as competence centres.

6.2 Summary of findings

In chapter 5, above, a general analysis of integrated international production among MOFAs located in Sweden was presented. Table 6.1, summarizes the main empirical findings. First, although all affiliates included in this study are manufacturers, part of their total turnover consisted of resale of corporate products manufactured by sister- or parent-firms abroad. In total, half of MOFAs (50%) indicate that they are involved in resale of products on behalf of parent- and/or sister-firms, accounting for 13 percent of MOFAs' total sales. Basically, resale of corporate products are focused on the Swedish market, and, to a smaller extent also on the neighbouring Nordic market, while resale of corporate products in Western Europe and in non-European markets is marginal. Concerning MOFAs manufactured sales, it was found that, in aggregated terms, over half of total manufactured sales were exported, while less than half were sold on the local host market in Sweden. MOFAs main export markets are found in Western Europe and in different non-European markets, while the adjacent Nordic market accounts for a relatively small share of total manufactured exports. Only very few MOFAs focused exclusively on host market production, while around 40 percent

Table 6.1 *Characteristics of MOFAs located in Sweden 1993.*

	All MOFAs (N=296)
Resale intensity (a)	13%
Affiliates with resale of corporate products	50%
Export intensity (b)	53%
Geographical scope of exports (c)	Nordic 21%, WE 48%, ROW 31%
Exporting affiliates	90%
Export intensive affiliates (d)	39%
Intra-firm exports (e)	44%
Exporting affiliates with intra-firm exports	68%
Import intensity (f)	55%
Intra-firm imports (g)	29%
Affiliates with intra-firm imports	48%
Intra-corporate coordination	Mainly R&D and finance, but also marketing
Intra-corporate resource flows	Mainly finance, product technology and marketing
Sources cited as most important for generating technological competence	72% Internal capacity, 18% Corporate firms abroad, 5% External firms in Sweden
Affiliates with extensive intra-corporate technological cooperation	41%
Affiliates with extensive inter-firm technological cooperation	18%, mainly in Sweden
Affiliates claiming external- or corporate firms more important for generating technological competence	54% corporate firms more important 27% external firms in Sweden more important
Affiliates operating as competence centres	23%

Note:
a) Value of resale of finished corporate products in total sales
b) Value of exports in manufactured sales
c) Value of exports to Nordic countries, Western Europe and Rest of World, respectively, in manufactured exports
d) MOFAs with over 50% exports in manufactured sales
e) Value of intra-firm exports in manufactured exports
f) Value of imports in total purchases of material inputs
g) Value of intra-firm imports in total imports of material inputs

Source: Survey data by the author

were identified as export intensive, exporting most of their manufactured sales. It was also found that almost 70 percent of those affiliates which were engaged in export activities, organized these, at least partly, as intra-firm sales to parent- and sister-firms. In total, over 40 percent of MOFAs exports were internalized by means of intra-firm exports, corresponding to 25 percent of total sales. Although a substantial share of total exports and total sales were internalized, the products that were sold on an intra-firm basis were almost exclusively characterized as being aimed at external customers, but sold through the parent-corporations' sales organization. Only one percent of total manufactured sales were in the form of intermediate input goods, aimed at further processing by parent- or sister-firms outside Sweden.

Examining the procurement of material inputs by MOFAs, it was found that over half of the total value of purchased components, parts and other material inputs, used by the affiliates in their production, was imported, while less than half of the total purchasing value was spent on suppliers located in Sweden. Almost half of all MOFAs were importing material inputs, at least partly, from sister or parent-firms, while little more than half of MOFAs exclusively purchased material inputs from independent suppliers. In total, around 30 percent of all imported material inputs were purchased through intra-firm imports. Geographically, the majority of these intra-firm imports came from sister- or parent-firms located in Western Europe and in the Nordic countries, although intra-firm purchases from North America and Rest of the World were also identified.

In terms of intra-corporate integration of other parts of the value chain, three aspects was analysed. Firstly, it was found that coordination between MOFAs in Sweden and parent- and sister-firms abroad occurred above all in the R&D and finance functions, and, to a somewhat lesser extent in the marketing function. Intra-corporate coordination of quality control, manufacturing, distribution and after-sale services was found in only very few MOFAs.

Trying to estimate the importance of different resources MOFAs receive from their parent- corporations, it was found that most MOFAs indicated that financial resources were among the most important. Many affiliates also indicated access to product technology, respectively, an international marketing organization, as being among the most important. Of least importance seem to be resources related to an international procurement organisation, process technology and the possibility to achieve scale economies in production.

Secondly, the importance of integrating the capacity of generating technological competence was partly captured by analysing to what extent MOFAs claimed that they were engaged in extensive technological cooperation with corporate firms, external firms and R&D institutions, located in Sweden and abroad, respectively. Here it was found that around 40 percent of MOFAs claimed that they were engaged to a large or very large extent in technological cooperation with corporate firms abroad, while around half as many MOFAs (18%), claimed that they were engaged to a large or very large extent in technological cooperation with external firms in Sweden. Only very few MOFAs indicated that they extensively cooperated with external firms

abroad or with R&D institutions.

The importance of integrating the capacity to generate technological competence was also studied by analysing the extent in which MOFAs claimed that this were mainly developed internally, alternatively, developed in cooperation with corporate or external firms. Here, over 70 percent of MOFAs claimed that their technological competence was mainly developed internally by themselves, while almost 20 percent claimed corporate firms abroad as the main source for the development of technological competence. Only 5 percent of MOFAs claimed that external firms in Sweden were the main source when developing technological competence.

Finally, the importance of integrating the capacity for generating technological competence was also found by analysing which cooperative partner, i.e corporate firms, external firms and R&D institutions, in Sweden and abroad, respectively, was perceived by the local managers in MOFAs as the most important source for generating their technological competencies. It was showed that most affiliates (54%) indicate that corporate firms abroad are the main partners when generating technological competence. If we add the share of affiliates suggesting that corporate firms in Sweden are the main source for generating technological competence, (7%), then around 60 percent of MOFAs claim corporate firms as being most important. It was also interesting to notice that over one fourth of the affiliates claim that external firms in Sweden are the most important partner when generating technological competence. Cooperation with external firms abroad is indicated by few affiliates as being the relatively most important technology generating source.

Thirdly, integration of various parts of the value chain was studied, analysing the extent in which individual MOFAs operate as competence centres in different functional areas, on behalf of sister- or parent-firms. It was found that almost one quarter of affiliates claimed that they operated as competence centres, having corporate responsibilities in at least one functional area. The most cited functional areas where MOFAs operated as competence centres was related to the R&D, marketing and sales functions. In three quarters of competence centres this included sister or parent-firms outside the Nordic countries, while in one quarter of MOFAs this exclusively included the operations in the Nordic countries.

6.3 Discussion of general findings

6.3.1 Exports and local sales

6.3.1.1 Exports by MOFAs in Sweden compared to affiliates in other countries

Firstly, an analysis of whether MOFAs located in Sweden seem to be more export-oriented compared to foreign affiliates located in other comparable countries is problematic, since detailed, up-to date surveys of exports by foreign affiliates are scarce. However, compared to the export intensities of foreign affiliates of US,

Japanese and Swedish TNCs, located in developed countries, as well as foreign affiliates in France and Finland, MOFAs in Sweden seem to be more export-oriented. For example, as was shown in section 4.2, above, in 1992, foreign affiliates of US and Japanese TNCs, located in developed countries, exported some 40 percent and 20 percent, respectively, of total sales. Among these affiliates, those located in the EC are somewhat more export-oriented compared to the other. The most recently available estimates of foreign affiliates of Swedish TNCs show that, on average, they exported around 30 percent of total sales in 1990. Again, the most export-oriented foreign affiliates were found in the EC region, especially those located in the original EC6 countries, where 47 percent of affiliates' total sales, were exported. In Finland and France, foreign affiliates exported around 30 percent of total sales in 1990. Compared to these figures it seems that MOFAs in Sweden are somewhat more export-oriented, as over half, or 53 percent, of manufactured sales were exported in 1993. In the surveys of exports among foreign affiliates of Swedish TNCs, it was also found that around one quarter had no exports. The corresponding figure for MOFAs in Sweden is only 10 percent, which also supports the view that MOFAs in Sweden seem to be relatively export-orientated. Also, comparing the share of exports among foreign-located affiliates of Swedish TNCs in different industries, (see table 4.4), with the share of exports among corresponding MOFAs in Sweden (table 5.10), suggests that MOFAs in Sweden seem to be more export-oriented in all industries, except in the transport industry. Moreover, compared to foreign affiliates in France, MOFAs in Sweden seem to be more export-orientated in all industries, while compared to foreign affiliates in Finland, they are more export-orientated in all industries, except in the paper and motor vehicles industries where the export intensities are almost the same (see table 4.3).

6.3.1.2 Exports by MOFAs in the 1990s, compared to earlier

Generally, as was shown in section 4.2, it is suggested that the export intensity of foreign affiliates has increased over time. Empirically, this has also been shown for US and Swedish TNCs, while that of Japanese affiliates seems to have decreased. Although the present study of exports by MOFAs in Sweden is a cross-sectional survey, covering only one year, it is possible to make some comparison with earlier findings on exports by foreign affiliates in Sweden (see section 3.12). Compared to exports by foreign affiliates located in Sweden in the 1960s and 1970s, it is clear that MOFAs in 1993 are more export oriented. In 1970, 37 percent of total sales of foreign manufacturing affiliates were exported, compared to 53 percent in 1993. Moreover, in the early 1960s only 20 percent of all affiliates exported at least 10 percent of total sales. In 1993 the corresponding figure for MOFAs was as high as three quarters.

6.3.1.3 Exports by MOFAs compared to domestic firms

TNCs and their foreign affiliates are suggested as being more export-orientated compared to uni-national firms, see section 4.2 above. This has also been found in earlier surveys of foreign affiliates located in Sweden during the 1970s and 1980s (see section 3.12). For example, in 1988, foreign affiliates were found to be almost as export-intensive as all manufacturing firms in Sweden. The foreign affiliates were also found to be substantially more export-intensive compared to domestic firms without foreign production. Also, the foreign affiliates were just as export-intensive as all Swedish TNCs, which had foreign production, except for a very small group of the most internationalized Swedish TNCs. The general findings in the present study of exports by MOFAs located in Sweden in 1993, seem to confirm the view that foreign affiliates, on average, tend to be more export-orientated compared to domestic firms. In section 5.2.4.2 we found that the most recently available estimates show that, in 1991, exports by all manufacturing firms in Sweden was 33 percent, compared to 53 percent among MOFAs in 1993. Recent findings also show that MOFAs in Sweden are almost as export-intensive as all Swedish TNCs, which, in 1990, exported 56 percent of their Swedish output.

6.3.1.4 Are MOFAs concentrated in export-intensive industries?

One of the reasons why TNCs are found to be more export-orientated, compared to uni-national firms, is related to the fact that they often are concentrated in export-oriented industries, see section 5.2.4.1, above. At the same time it has also been found that TNCs seem to be more export-orientated compared to domestic firms operating in the same industries. In the present study, when the empirical findings on exports by MOFAs are compared to exports by domestic firms, operating in the same industries (see section 5.2.4.2, above), it was found that MOFAs were more export-orientated in all industries, when measured at the ISIC 2-digit level. Although this comparison is based on a low level of industry-aggregation, possibly hiding intra-industry variations, it seems that the relatively higher export-intensity found among MOFAs, compared to domestic firms, can only partly be explained by the fact that MOFAs tend to concentrate in export-oriented industries. Instead, this suggests that MOFAs tend to be more export-oriented compared to domestic firms, even when industry variations in export intensities are considered.

6.3.1.5 Home and third-country exports

Generally, as was shown in section 4.2, most exports by foreign affiliates, with the exception of those located in developing countries, are found to be basically directed towards third-country markets. Empirical findings show that foreign affiliates of

Swedish TNCs, and, to a lesser degree, also foreign affiliates of US and Japanese affiliates, mainly export to markets outside their home-country. Although we do not have enough detailed figures to analyse the country-destination of exports, the findings in the present study suggest that only a small part of total exports by MOFAs are likely to go to the home-country of the parent-company. For example, exports to other Nordic countries represent a minor share of total exports by Finnish and Norwegian affiliates. Exports to North America represent a minor share of total exports by US affiliates, while exports from French MOFAs are mainly directed to other markets than Western Europe. Although the majority of exports by all Western European affiliates, except affiliates from France, are directed to the Western European market, an almost equally large share of exports goes to non-European markets among UK, Germany and Dutch MOFAs. In total, this suggests that exports by MOFAs in Sweden, are only partly directed to the home-country of the affiliate, and are mainly designated to third country markets.

6.3.1.6 Exports by MOFAs and regional integration

As was discussed in section 4.2, export-oriented affiliates are often found to operate inside trading areas, such as the EC market. Although we do not have specific figures on exports going to different trading blocks, the geographical distribution of manufactured sales of MOFAs indicate that a majority of exports are most likely directed to the EC market, rather than to EFTA countries. In addition, manufactured sales are also partly directed to various non-European markets. Thus, since Sweden, in 1993, still, was a member of EFTA, (together with Austria, Switzerland, Finland, Norway and Island), the geographical distribution of MOFAs' exports indicate, that export-oriented affiliates are not only serving the local trading area. One explanation for the findings showing that MOFAs' exports in large are directed to the total European market, are most likely related to the fact that since the middle of the 1970s the whole European market has been a free-trade area for most manufactured goods through the implementation of free-trade agreements between the European Economic Community, (EEC), the European Coal and Steel Union (ECSC) and individual EFTA-countries. At the same time, however, a number of non-tariff barriers have been prevalent, restricting foreign trade between between individual European countries. In 1993, Sweden became a member of the European Economic Space (EES), which formally stipulated that also non-tariff barriers between EU and EFTA countries are to be removed.

Furthermore, earlier studies of exports by foreign affiliates have shown (see section 4.2), that, in the 1970's, American affiliates in Sweden especially were exporting most of their output, while affiliates from Western Europe were mainly host-market orientated. By the beginning of the 1990s, these differences had been reduced, although North American affiliates still exported over half of their output, while

affiliates based in EC and EFTA countries exported somewhat lower shares of manufactured sales. The present study shows that US-based affiliates are still among the most export-orientated, although affiliates from Finland and the UK are on average, exporting almost as much. The most export-orientated, however, are affiliates from Germany. By looking at the destinations of exports by affiliates from these countries, it is also evident that exports by MOFAs are to a large extent directed to the EU market, as well as to various non-European markets, rather than to EFTA countries. This suggests that, in 1993, Sweden was not only used as an export-base by affiliates from the US, supplying the European market, but that affiliates based in EFTA, as well as EC countries also export their products to the Western European market, as well as to more distant markets outside Europe.

Moreover, if we compare the geographical scope of export markets among foreign affiliates located in Sweden in the early 1960s (section 3.12) with findings of MOFAs in 1993 (section 5.2.2), then it seems that the scope has widened. For example, in the early 1960s, 40 percent of the foreign affiliates exported exclusively to the Nordic market, compared to only 18 percent in 1993. At the same time, in the 1960s, one fifth of the affiliates exported to the US market, compared to one third of affiliates in 1993. Finally, in the 1960s, exports to markets outside Western Europe (including the Nordic countries) and the US, were only performed by around one quarter of all exporting affiliates, compared to 50 percent of the affiliates in 1993. In sum, MOFAs' export markets in 1993 are less focused on the Nordic market, and more on various global markets, compared to affiliates located in Sweden in the 1960s.

Together, these findings shows that the geographical scope of exports by MOFAs, located in Sweden in 1993, not only took place inside specific trading areas, but also included inter-continental shipments of manufactured products to markets in most parts of the world.

6.3.2 Intra-firm exports

6.3.2.1 Intra-firm exports by MOFAs in Sweden compared to affiliates in other countries

If we turn to a discussion on the findings of intra-firm exports by MOFAs located in Sweden, compared to affiliates located in other comparable countries, it is, again, difficult to make comparisons with other studies, due to a lack of up-to-date surveys. As was discussed in section 4.4.1, besides irregularly published case-studies, the most comprehensive data on intra-firm trade by foreign affiliates relates to US and Swedish TNCs. The most recently available data from these studies shows that, in 1987, some 28 percent of all US manufacturing affiliates' sales were exported on an intra-firm basis, with affiliates located in the EC being, relatively, most involved in intra-firm sales. Concerning the proportion of exports that were internalized among US affiliates, this seemed to be substantially higher, or around three quarters in the mid

1980s. More recent estimates, including all manufacturing as well as non-manufacturing affiliates of United States TNCs, showed that, in 1992, the share of intra-firm exports of total exports was 64 percent. Some recent figures related to foreign manufacturing affiliates of Swedish TNCs show substantially lower shares of intra-firm exports, as only 17 percent of their total exports were intra-firm in 1990. Compared to these findings, in section 5.2.3, it was found that MOFAs, located in Sweden in 1993, exported 24 percent of total manufactured sales and 44 percent of total manufactured exports to parent- or sister-firms. Thus, this seems to suggest that, in relation to total manufactured exports, MOFAs located in Sweden tend to be substantially less involved in intra-firm exports, compared to manufacturing affiliates of US TNCs, but more involved in intra-firm exports compared to manufacturing affiliates of Swedish TNCs. At the same time, the proportion of total sales that are organized as intra-firm exports are almost the same for MOFAs in Sweden and US affiliates, reflecting a higher export-intensity among the former, compared to the latter.

6.3.2.2 Intra-firm exports by MOFAs in the 1990s, compared to earlier

Generally, as was discussed in section 4.4.1, the proportion of world trade that is intra-firm have increased since the 1960s, although some recent signs show that intra-firm trade as a proportion of total world trade in the 1990s seems to be stable or even decreasing. Empirical evidence of stable shares of intra-firm exports during the 1977-1990 period is also provided in studies of affiliates of Swedish TNCs (see section 3.13). Comparing earlier findings on intra-firm exports by foreign affiliates located in Sweden in the 1960s-1980s (section 3.13), with the findings of the present study, the tendency of growth of intra-firm exports is also unclear. Although the share of foreign affiliates exporting on an intra-firm basis seems to have increased somewhat, from 60 percent in the early 1960s to 68 percent in 1993, estimates of intra-firm exports show, in fact, that, on average, this has decreased from over 50 percent of total exports in 1977, to 40 percent in 1989 and 44 percent in the present study. One of the reasons for this decrease in intra-firm exports during the last decades might be related to the fact that many MOFAs located in Sweden in 1993 have been acquired recently. Since acquired affiliates, as was discussed in section 4.4.2, are often found to be less integrated through intra-firm trade, compared to green-field investments, this may partly explain, why intra-firm exports seem to have decreased during recent decades.

6.3.2.3 Intra-firm exports of material inputs and finished products

As was also briefly discussed above, (section 4.4.2), most theoretical discussions which try to explain the existence of intra-firm trade seem to focus on the economic gains to be received through vertical integration, where different units of a TNC are

linked together through flows of intermediate input goods in the course of the production process. However, recently, it is suggested that a more complex set of relationships are likely to govern the internal transfer of goods and services among TNC-units located in developed countries, where intra-firm trade has often been found to be positively related to horizontal rather than to vertical integration. One of the most interesting findings related to intra-firm exports by MOFAs located in Sweden (see section 4.4.2) shows that almost all intra-firm exports take the form of finished products, aimed at external customers, while intra-firm exports of material inputs for further processing by sister and parent-firms, in total, is marginal and in most affiliates non-existent. This seems to confirm the view that relatively high shares of intra-firm exports by MOFAs are not necessarily associated with vertical integration in terms of deliveries of material inputs, but are also associated with exports of finished products, which are distributed to external customers through parent-corporations' sales organisation.

6.3.2.4 Intra-firm exports and high-tech industries

As was discussed above, it is often suggested that intra-firm trade seems to be most important in high-technology sectors and in those producing complex products, e.g. automobiles and consumer electronics, while less important in low-tech, resource-based industries, such as metals and wood products. Unfortunately the data in the present study does not allow for an identification of industries according to technology-intensity or R&D expenditures. However, a look at the variations in intra-firm exports between different industries (presented in section 5.2.3) suggests that, although the highest shares of intra-firm exports can be found in industries which are often associated with high R&D expenditures (OECD 1995), or complex manufacturing, such as professional goods and electrical machinery, comparably high shares of intra-firm exports can also be found in the food, and petroleum, coal and rubber industries, which are not normally suggested as being associated with extensive R&D activities or complex manufacturing. One of the reasons for this is probably the fact that almost all of intra-firm exports of MOFAs consist of finished products aimed at external customers. In this situation, intra-firm exports are probably based on a utilization of parent-corporations' international sales organization, rather than based on considerations related to the internal transfer of inputs, embodying proprietary know-how.

6.3.2.5 Intra-firm exports and regional integration

Another interesting finding on intra-firm exports in the present study is that, in parallel to what was discussed above relating to exports, intra-firm exports are often found to be associated with different forms of regional economic integration (section 4.4.2).

For example, intra-firm trade among TNCs operating inside the EC region has been found to be growing substantially during the latest decades. Although it is not possible to identify the share of intra-firm exports which are directed to other EFTA-member countries in detail, the findings of MOFAs' intra-firm sales suggest that a substantial part are most likely shipped to EC countries, as well as to non-European countries. Since Sweden, up to 1995, was part of EFTA, the findings of intra-firm exports (presented in section 5.2.3) indicate that these are not only organized inside regional trading areas, but to some extent include intra-regional flows of products. As was discussed above, part of an explanation for this is most likely related to the fact that since the middle of the 1970s the whole European market has been a free-trade area for industrial goods through free-trade agreements between EEC and the EFTA countries. Examples of intra-firm exports between trading areas include intra-firm exports of material inputs by Finnish and Swiss MOFAs in Sweden to their sister-firms located in Japan/South East Asia, French and UK affiliates exporting material inputs to their sister-firms in North America and US affiliates exporting inputs to sister-firms in Western Europe.

In addition, earlier studies have identified variations in the way foreign affiliates from different home countries organize their exports from Sweden (see section 3.13). For example, in the early 1960s, West-German firms, especially, were using intra-firm exports from Sweden as a means of marketing products abroad, while American firms were found to shift exports via external channels to intra-firms more rapidly than firms based in any other country during the 1975-79 period. In the early 1990s, US-based affiliates were found to internalize export sales to a greater extent than other affiliates. The present study also shows substantial variations in the extent in which affiliates from different home countries use intra-firm trade as a means of exporting from Sweden. EC-based affiliates seem, on the whole, to be most involved in intra-firm exports, where the highest shares of intra-firm exports of total exports were found among German, Dutch and French affiliates, while lowest shares were found in US, UK and Norwegian affiliates.

6.3.3 Imports of material inputs

6.3.3.1 Imports by MOFAs in Sweden compared to affiliates in other countries

In section 5.3.1, it was found that, on average, 55 percent of total material inputs purchased by MOFAs located in Sweden in 1993 were imported, while 45 percent were purchased in Sweden. Comparing these figures with the import intensity of MOFAs located in other countries is even more problematic than comparisons of export intensities among affiliates located in different countries, due to a lack of relevant studies. The only regularly published surveys on import-behaviour by foreign affiliates relate to US and Japanese TNCs. These show, for example, that, in

1987, some 50 percent of total inputs by Japanese affiliates in Europe were imported from Japan, while third country imports represented only 3 percent, and local sources 46 percent (JETRO 1988). In 1993, more than half of the Japanese manufacturing affiliates in Europe purchased over 70 percent of materials and parts inside the EU. At the same time, more than 74 percent of these affiliates purchased more than half of their inputs inside the EU (JETRO 1994). Other estimates show that, in 1992, 37 percent of all purchases by manufacturing, as well as non-manufacturing foreign affiliates of Japanese TNCs, were imported, while 63 percent were purchased "locally" (UNCTM 1995). According to recent figures of purchases of majority-owned foreign manufacturing affiliates of US TNCs (Mataloni and Goldberg 1994), only 8 percent of total purchases were imported from the US in 1991, while 92 percent were "local" purchases.

Unfortunately, these surveys of sourcing policies by Japanese and US TNCs use a methodology not well suited to analysing the extent in which foreign affiliates import their material inputs, alternatively purchase these from domestic suppliers. For example, the figures of local content of Japanese foreign affiliates are measured as the ratio of the value of locally made parts against the total product price. In other words, the received figure is affected by differences in the proportion of value added in different affiliates. Moreover the term "local" refers, not to individual countries, but to trading areas, e.g. to the EU as a whole. In the case of foreign manufacturing affiliates of US TNCs, local content is based on the proportion of their output accounted for by their own production and by inputs purchased outside the US.

Hence, neither for Japanese, nor for US foreign affiliates, is it possible to estimate the extent in which material inputs are purchased from suppliers on individual host-markets, or relate figures on purchases in the host market to total purchases of material inputs. Therefore, since we have not been able to receive information on the extent in which affiliates located in other countries import their material inputs from suppliers outside their host countries, an analysis of whether MOFAs in Sweden are more, or, less, engaged in imports of material inputs, compared to affiliates located in other comparable countries, has not been possible.

6.3.3.2 Imports by MOFAs in the 1990s compared to earlier

Another interesting aspect of imports by foreign affiliates is related to whether the proportion of inputs that are purchased from local suppliers tend to increases through time. As was discussed in section 4.3, the share of inputs bought from domestic suppliers is often suggested to increase through time, if domestic suppliers can meet the quality, price and delivery standards. By comparing the findings from the present study with some earlier findings on imports and domestic purchasing by foreign affiliates in Sweden, it is possible to see some indications that the share of inputs bought on the host market tend to increase through time. As was discussed in section 3.14, only a few earlier estimates on imports by foreign affiliates is available. These

show that, in the early 1960s, around 85 percent of totally 132 investigated foreign affiliates in Sweden, claimed that they imported at least some raw materials or other inputs. As a comparison, among MOFAs in 1993, a slightly higher share, or 95 percent, claimed that they, at least partly, imported inputs from suppliers abroad. Only one earlier figure on the average import-intensity of foreign affiliates' in Sweden exists, relating to the late 1970s. Unfortunately, this figure shows the value of imported inputs in relation to total sales of manufactured output, instead of the value of imported inputs in relation to total purchases of inputs.

As was discussed above concerning surveys of US and Japanese affiliates, this methodology, when estimating the share of imports and domestic purchasing of inputs, is not ideal, since it may be affected by variations in the value-added by individual affiliates. In the present study, import intensities are measured by comparing the value of imported materials with the total value of all procurements of material inputs, since this gives a more reliable figure of the share of inputs that are imported. However, if one applies the same method as was used in the survey on imports by foreign affiliates in Sweden in the late 1970s, it can be found that the share of imported inputs, in relation to total manufactured sales, seems to have decreased from 30 percent in 1978 to 22 percent in 1993. If this decrease in imports of inputs, in reality, also means that a larger share of all material, parts and components are purchased from suppliers in Sweden, is more problematic to evaluate, because these figures can be affected by an increase in the value added in the production process among MOFAs during the period, resulting in a proportionally lower share of imports in 1993 compared to 1978. Furthermore, these figures do not relate to the same affiliates, but include a number of newly established, and, most often, acquired affiliates, compared to those investigated in the late 1970s. Comparisons of import propensities may, therefore, be affected by differences in the purchasing behaviour of older and more recently incorporated affiliates, where the latter mainly have been acquired, compared to the former, which, to a larger extent were green-field investments. As will be analysed below, variations exist in the extent in which acquired affiliates purchase material inputs from suppliers on the Swedish host market, compared to green-field affiliates.

6.3.3.3 Imports by MOFAs and domestic firms

As was discussed in section 4.3, it is often suggested that foreign-owned firms tend to import more than indigenous firms. As was showed in section 3.14, a survey of foreign affiliates in Sweden in the early 1960s suggested that, without presenting any figures, the activity in many of the foreign-owned affiliates was dependent, to a significant degree, on raw materials and parts imported from the mother-company abroad. It was thus hypothesized that foreign-owned affiliates were dependent, to a greater extent than comparable domestic companies, on imported raw-materials and semi-finished

inputs. Only one earlier estimate of the import-intensity of inputs by foreign and domestic firms exists. This shows that, in the late 1970s, the import-intensity, measured as the value of imports in relation to total sales of internal production, was 30 percent for foreign affiliates, almost 19 percent among Swedish TNCs and 11 percent among domestic companies without foreign affiliates. Part of an explanation for the higher import-shares of the foreign owned affiliates was found to be related to the industry distribution of the foreign firms, since these, to a substantial extent, were concentrated in the chemical industry, characterized by a high level of importing. However, not all of the differences in the import-intensity between foreign and domestic firms could be attributed to industry patterns, since the foreign affiliates showed a higher import-intensity in all industries, at the ISIC 2-digit level.

Unfortunately, it has not been possible to find more recent figures on the purchasing performance of Swedish manufacturing firms in general, However, the findings presented in section 5.3.3, above, including a comparison between smaller MOFAs and comparable domestic, small- and medium-sized enterprises (SMEs), suggest that, smaller MOFAs, on average, seem to import a substantially higher proportion of material inputs, compared to domestic SMEs. Furthermore, among the smaller MOFAs, a substantially lower share were identified as non-importers and a substantially larger share as import-intensive, importing most of their inputs, compared to domestic SMEs. Higher shares of imports among foreign affiliates were also indicated in three out of four industries where information is available. Thus, taken together, this suggests that, although comprehensive comparisons on purchasing behaviour among foreign and domestic firms is difficult, due to lack of data, existing figures indicate that even in the early 1990s, foreign affiliates seem to be more engaged in imports and less in purchases from suppliers in Sweden, compared to domestic firms.

6.3.3.4 Imports and intra-corporate coordination of the purchasing function

In section 4.3, above, it was also suggested that one of the major reasons why foreign affiliates are often found to be weakly embedded into the local economy, e.g through relatively low purchasing from domestic suppliers, may be related to the tendency of parent-firms to coordinate the purchasing function of their affiliates. A higher share of imported inputs may occur when parent firms and affiliates coordinate their procurements, making use of superior information on the world-wide availability, price and quality of inputs. Empirical findings from the present study of MOFAs located in Sweden seem to give some, albeit weak, support to the perspective that coordinated affiliates tend to be more import-intensive, compared to affiliates where the purchasing function is not coordinated. The findings of the present study show, firstly, that around 30 percent of MOFAs coordinate their purchasing with parent- and sister-firms. Secondly, in MOFAs where the purchasing function is coordinated with parent- and sister-firms abroad, a somewhat higher share of inputs are imported,

compared to non-coordinated MOFAs. While coordinated MOFAs, in total, import 58 percent of total purchases of material inputs, the corresponding figure for non-coordinated MOFAs is 51 percent.

Furthermore, among MOFAs where the purchasing function was coordinated, all affiliates imported at least some material inputs, while among non-coordinated affiliates, a small share (6%) bought all their inputs from suppliers in Sweden. Finally, among coordinated MOFAs, a somewhat higher share (53%) can be identified as import-intensive, importing most of their material inputs, compared to non-coordinated MOFAs, where 44 percent imported most of their inputs. The conclusion from this analysis of MOFAs located in Sweden in 1993, shows that, although there is a small tendency for affiliates, where the purchasing function is coordinated, to be involved in a somewhat larger share of importing of material inputs, compared to non-coordinated MOFAs, this tendency is not very strong.

6.3.4 Intra-firm purchases of material inputs

6.3.4.1 Intra-firm imports by MOFAs in Sweden compared to affiliates in other countries

To what extent are foreign affiliates in Sweden, compared to affiliates located in other countries, involved in intra-firm imports? As was showed in section 4.4.2, some recent figures on intra-firm imports of foreign-located affiliates of Swedish TNCs exist, making possible some comparisons with the findings from the present study. Unfortunately, the methodology applied in these studies of intra-firm imports among affiliates of Swedish TNCs restricts the possibilities of making a thorough comparison with the present study for two reasons. Firstly, intra-firm imports by foreign affiliates of Swedish TNCs cover only imports from parent-firms in Sweden, while intra-firm imports of MOFAs in the present study includes parents- as well as sister-firms outside Sweden. Secondly, intra-firm imports by foreign affiliates of Swedish TNCs are based on the value of affiliates' imported intermediate inputs from parent-firms in relation to affiliates' total sales. As in the case of the surveys of purchasing by Japanese and US affiliates, discussed above, this method of estimating intra-firm imports is not ideal, since it may be affected by the degree of value added in affiliates' production process.

In the present study, the value of intra-firm imports is compared to the value of total imported inputs, since this method better reflects the degree in which individual affiliates are dependent on parent- or sister-firms for their imports of intermediate inputs. However, if we use a comparable methodology, measuring imported intermediate inputs against total sales, it seems that MOFAs located in Sweden, on average, tend to be less dependent on intra-firm imports of intermediate inputs, compared to foreign located affiliates of Swedish TNCs. As was shown in section 4.4.2, in 1990, imports of intermediate products from parent-firms represented 8

percent of total sales among foreign located affiliates of Swedish TNCs, while the corresponding figure for MOFAs located in Sweden in 1993 was 5 percent. The generally higher share of intra-firm imports among Swedish affiliates abroad is mainly due to a higher share of intra-firm imports by affiliates operating in the transport industry, and, to a lesser extent, also affiliates in the electronics industry. In these two industries, the foreign-located affiliates of Swedish TNCs are more involved in intra-firm imports, compared to MOFAs in Sweden. In the iron and steel industry, on the other hand, MOFAs located in Sweden are more involved in intra-firm imports. In all other industries, MOFAs in Sweden and foreign affiliates of Swedish TNCs seem to be equally involved in intra-firm imports, when measured as a share of total sales.

The similarity between MOFAs located in Sweden and foreign affiliates of Swedish TNCs is also shown in the fact that an almost equally large share of both categories of affiliates are involved in intra-firm imports of intermediate inputs. While 40 percent of foreign manufacturing affiliates of Swedish TNCs imported, at least partly, intermediate products from parent-firms in 1990, the corresponding figure for MOFAs located in Sweden in 1993 was 48 percent.

6.3.4.2 Intra-firm imports by MOFAs in the 1990s compared to earlier

Only one earlier survey on the propensity of foreign affiliates in Sweden to import intermediate products from their parent-corporations exists, see section 3.15. This shows that, of the foreign-owned affiliates which were located in Sweden in the mid-1960s, 75 percent imported, at least partly, from other parts of the parent-corporation, of which 20 percent received all their imports from parent- and sister-companies. Most of the affiliates, or 55 percent, imported from both parent- and sister-companies, as well as from external firms, while 10 percent of the affiliates imported only from external firms. In the early 1960s, it was also suggested, unfortunately without presenting any figures, that the activity in many of the foreign-owned affiliates was dependent to a significant degree on raw materials or components imported from the mother-company. As shown in section 5.3.2, the share of MOFAs located in Sweden in 1993 which were engaged in intra-firm imports was substantially lower, or 52 percent, compared to 75 percent in the early 1960s. At the same time, the proportion of affiliates which imported all inputs from parent- and sister-firms was less than 10 percent in 1993, compared to 20 percent in the early 1960s. These findings suggest that the share of affiliates involved in intra-firm imports is substantially lower in 1993s, compared to the 1960s. At the same time, the share of affiliates which are totally dependent on intra-firm purchases for their imports is somewhat lower. If this also means that the average share of imports, accounted for by intra-firm imports is lower in the 1990s, compared to earlier, is not possible to estimate due to a lack of earlier data.

6.3.4.3 Intra-firm imports and high-tech industries

As was discussed above, intra-firm trade has often been seen to consist mainly of intermediate products transferred to other corporate units for further processing. More recently, the importance of intra-firm trade of finished products seems to have increased, as many horizontally integrated affiliates import complementary products from parent- and sister-firms in order to provide customers with a broader range of products, compared to what is being produced by the affiliate locally. Above, it has been shown that intra-firm exports by MOFAs in Sweden in 1993 almost exclusively consisted of finished products aimed at external customers. Intra-firm imports by MOFAs, on the other hand, consist of both finished products for resale, as well as material inputs for further processing. As was shown in sections 5.2.1 and 5.3.2, total resale of finished products account for 13 percent of MOFAs' total sales, while intra-firm imports of material inputs account for around 30 percent of total imports and 20 percent of total purchases of material inputs.

Moreover, it is often suggested that intra-firm trade seems to be highest in high-technology sectors and in those producing complex manufactures, e.g. automobiles and consumer electronics, while relatively low in low-tech resource-based industries such as metal and wood product industries. Unfortunately, the data in the present study does not allow for an identification of industries according to technology-intensity. However, a look at the variations in intra-firm imports of material inputs between different industries (presented in section 5.3.2) suggests that intra-firm imports in industries which can be associated with high R&D expenditures (OECD 1995), or complex manufacturing, such as the electrical and non-electrical machinery industries, show comparably low shares of intra-firm imports. At the same time, in the industries which normally are not suggested as being associated with extensive R&D activities, such as the iron and steel, plastic products and textile industries, the highest shares of intra-firm imports of material inputs are found. Possibly, this can be explained by the existence of economies of scale at earlier stages in the production process, where inputs more efficiently are produced by parent- and sister-firms abroad, and, thereafter, purchased through intra-firm imports by the affiliates in Sweden. Another plausible explanation of this pattern can, of course, also be related to the wide industry classification. Even if such industries as textiles and plastic products, at a ISIC 3-digit level, are not generally believed to be associated with high R&D expenditures, at a lower level of aggregation, in some parts of these industries, this can be a dominant characteristic of the production process.

6.3.4.4 Intra-firm imports and regional integration

An interesting finding on intra-firm imports of material inputs, can be related to the fact that this is often found to be associated with different forms of regional economic

integration (section 4.4.2). Since Sweden, up to 1995, was part of EFTA, the findings on intra-firm imports (presented in section 5.3.2), indicate that this is not only organized inside regional trading areas, but to a substantial extent include intra-regional flows of intermediate input goods. Although it is not possible, in detail, to identify the share of intra-firm imports of material inputs which originate in other EFTA-member countries, the findings show that a substantial part probably originate in non-EFTA countries. For example, US and Swiss affiliates organized sizable shares of intra-firm imports from the Nordic countries, while Danish and Finnish affiliates are involved in intra-firm imports from Western Europe. Again, as was discussed above in relation to exports, part of an explanation for this is most likely related to the fact that since the middle of the 1970s the whole European market have been a free-trade area for industrial goods through free-trade agreements between the EEC and the EFTA countries.

Furthermore, although only marginal intra-firm imports of material inputs originate in non-European countries, in some affiliates, e.g. those based in Germany, Switzerland and the US, intra-firm imports from sister- or parent-firms located outside Europe can be identified. This suggests that intra-firm imports of material inputs are not only organized inside trading blocks, such as the EU or EFTA, but that they are also organized between trading areas. Examples of imports of material inputs from sister-firms located in North Americas as well as in rest of the World also suggest that parts of these intra-firm shipments are intra-continental in geographical scope.

6.3.5 Intra-corporate coordination of different functional activities

Owing to the shortage of comparable studies on the extent in which MOFAs integrate other parts of their value-chains with parent- and sister-firms outside Sweden, it is difficult to draw conclusions from the present study. However, as was discussed in section 4.5, TNCs seem generally to have started integrating not only manufacturing operations on an international scale, but also a host of other functional activities through a complex integration strategy. Empirical indications suggest that those functional activities TNCs undertake in an integrated manner primarily include R&D, procurement, manufacturing, accounting, finance, training, corporate planning and legal activities, although no findings seem to exists as to the extent in which TNCs and their affiliates integrate their functional activities, or how large a share of affiliates are managed in an integrated fashion.

The findings of the present study give some insight into what parts of the affiliates' functional activities are managed in a coordinated fashion, and, in addition, gives some information concerning the share of affiliates that coordinate their functional activities with parent- and sister-firms. The findings show that a majority of affiliates seem to coordinate their finance and R&D functions with parent- and sister-firms outside Sweden, while around 30 percent of MOFAs claim that the procurement, sales and administration functions are managed in a coordinated fashion. At the same time,

after-sales services, manufacturing, distribution, and quality control are claimed to be coordinated with parent- and sister-firms by 15 percent, or less of the affiliates. In total 8 percent of MOFAs claimed that they managed all their functional activities autonomously from parent- or sister-firms. These findings seem to support the perspective that, today, a number of TNCs and their affiliates tend to manage various parts of their functional activities in an integrated fashion. Broadly speaking, the most common activities MOFAs in Sweden coordinate with parent- and sister-firms seem to be the same as has been found in other surveys. In addition to this, the present study gave indications that most MOFAs still seem to operate their functional activities in an un-coordinated fashion, except as regards the finance and R&D functions, where a great majority of the affiliates seem to be integrated with parent- and sister-firms.

6.3.6 Inter-firm and intra-corporate technological cooperation

As was discussed in section 4.6, most R&D conducted inside TNCs is still made by parent- firms. However, recently, foreign-located affiliates have also started to engage in R&D activities. At the same time, TNCs not only undertake R&D activities by combining the resources and technological capabilities of their own systems, but also by establishing collaborative relationships with external firms, e.g. suppliers and customers, as well as with universities and independent R&D institutions. Although it is hard to estimate the general significance of such cooperative arrangements, the literature on the subject seems to suggest a clear tendency towards rapid growth since the 1970s. The growing importance of foreign located sources for generating technological competencies among TNCs is illustrated by recent findings showing that a substantial part of the competitive advantages of some of the worlds' largest manufacturing TNCs is believed to be derived from their foreign-based activities. Among these TNCs, linkages with foreign firms were suggested as being one of the most significant sources of competitiveness, together with global competitive stimuli and access to natural resources and unskilled labour.

The findings from the present study show that, among MOFAs located in Sweden in 1993, a great majority (72%) believe that parent- and sister-firms are of secondary importance when generating their technological competence, and that this is mainly developed internally by the affiliates themselves. Less than 20 percent claimed parent- and sister-firms as being their most important source when generating technological competence. Furthermore, although most MOFAs claimed parent- and sister-firms abroad as their main partners for generating technological competence, less than half of the affiliates seem to be engaged, to any large extent, in cooperation with parent- and sister-firms on this behalf. The findings also show, that around 20 percent of MOFAs extensively cooperate with suppliers and customers in Sweden in order to generate technological competence. The importance of this cooperation is indicated by the fact that around a quarter of all MOFAs claim that this is of a

relatively greater importance when generating technological competence, than cooperation with parent- and sister-firms abroad. In sum, seen from the perspective of the affiliate, these findings indicate that parent- and sister-firms are still the most important partners when generating technological competence, although a sizeable share of affiliates generate technological competence in cooperation with suppliers and customers in the host country.

6.3.7 Indications of competence centres.

Finally, integrated international production has also been revealed through an analysis of the extent in which MOFAs located in Sweden in 1993 tend to operate as competence centres, including corporate responsibilities on behalf of parent- and sister-firms. As was discussed in section 4.6, foreign located affiliates of TNCs have, in recent years, been found to operate with corporate responsibilities, e.g. as product-line, regional or functional headquarters. Empirical studies of Swedish TNCs suggest that formal management centres as well as informal "power concentrations" have developed in many foreign affiliates, apart from the group management. These are above all related to production, and to a lesser degree to marketing and general management. Research centres are less common, while purchasing centres are non-existent.

Compared to the studies of foreign competence centres among Swedish TNCs, the present study used a less strict definition of how to define a competence centre. Nevertheless, comparing the findings of competence centres among MOFAs in Sweden and foreign affiliates of Swedish TNCs, we find, firstly, that, out of 296 identified foreign-based centres among Swedish TNCs, 70 percent were related to the production function, 14 percent to the marketing function, 10 percent to general management and 6 percent to the R&D function, while purchasing centres were non-existent. Compared to this, MOFAs located in Sweden seem to operate with corporate responsibilities in somewhat different functions. In these affiliates, out of a total of 67 identified competence centres, 30 percent were related to the R&D function, 27 percent to sales, 25 percent to marketing, 19 percent to production, 16 percent to general management and 12 percent to finance and administration. Affiliates operating with corporate responsibilities in procurement, quality control, distribution and after-sale services were found in only very few affiliates. A major difference is seen in the fact that a larger share of MOFAs located in Sweden operate with corporate responsibilities in the R&D function, and to a lesser degree also in the marketing function, while affiliates of Swedish TNCs to a larger extent operate with corporate responsibilities in production. These differences should not be taken too seriously, though, since they, to a large extent, may be an effect of differences in the methodology used when identifying competence centres among the two categories of affiliates.

Since no information on the total share of foreign located affiliates operating with

corporate responsibilities is provided in the studies of Swedish TNCs, or in other studies, it is difficult to make any comparisons of how common these competence centres are. The findings on competence centres among MOFAs in Sweden indicate that almost a quarter had received corporate responsibilities on behalf of at least one parent- or sister-affiliate outside Sweden, in at least one specified functional area. These responsibilities were, above all, related to the R&D, marketing and sales functions, indicated by 6-7 percent of all MOFAs, respectively. Functional areas where almost no affiliate had received corporate responsibilities included input and output quality control, procurement and distribution. Thus, the findings on corporate responsibilities among MOFAs located in Sweden, give some empirical support to the notion that, today, foreign-located affiliates of TNCs, have started operating as competence centres on behalf of parent- and sister-firms in various corporate functions, although this is still only found among a minority of affiliates.

Above, some general empirical findings on integrated international production among all MOFAs located in Sweden was presented and discussed in relation to some earlier findings on foreign affiliates located in Sweden, as well as on affiliates located in other countries. In the subsequent chapters, the general tendency towards increasing integration between TNC-units is discussed and analysed in relation to some new trends in FDI, which might have an impact on the extent in which the production of TNCs tends to be integrated. Firstly, in chapter 7 the degree of integrated international production is believed to vary depending of the mode of entry of affiliates. The traditional form of FDI, i.e. the set-up of new businesses through green-field investments in order to capture new, or to protect existing markets, is, at least, in developed countries, giving way to the practice of acquiring competitors, suppliers or other firms, controlling what are perceived to be assets complementary to those held by the investing firm. As acquired firms normally have their own technological and organisational structure, and at the same time have established business relations with suppliers and customers, they might be more difficult to integrate, than affiliates started by means of green-field investments.

In chapter 8, the extent of international integration is suspected to vary according to the size of individual affiliates. Traditionally, foreign affiliates have often been relatively small, and, to a large extent, dependent on parent-firms for much of their operations. Today, many foreign-located affiliates are large entities, controlling not only manufacturing operations, but also a host of other activities, including marketing and R&D. In part, this is a result of many foreign-located affiliates having grown during the years, while others have been acquired more recently. As a result, these large affiliates may be able to operate quite independently from parent-firms, compared to smaller affiliates.

In chapter 9, we study the extent in which integrated production is affected by the capability and willingness of TNCs, or their affiliates, to implement different international strategies when operating in different markets. Even if industry- or

country-specific factors put a premium on a rationalized strategy with extensive integration of large scale operations, the capability and willingness of individual TNCs to implement different international strategies will critically affect the degree of integration.

Finally in chapter 10, we discuss the possibility that integrated international production is likely to vary between different industries. Today many TNCs invest in countries or regions in order to capture specific skills and competencies held by suppliers, customers or other firms located in a specific country or region. These competencies are often generated in close relationship with other firms located in this specific region or nation, meaning that they are largely location-specific and difficult to transfer to other places, even if they are embodied in a majority-owned affiliate. Hence, depending on whether the foreign-located affiliate operates in an industry where the host country has generated an international competitiveness based on a cluster of interrelated firms and institutions, this might also affect the extent in which the affiliates are integrated into the activities of their parent-corporations.

Since these four ways of categorizing affiliates are based on analytical concepts, (i.e. mode of entry, size, international strategy, industry cluster), which are not easy to observe empirically, it is first necessary to identify the different categories of affiliates in order to use them in an analysis of variations in integrated international production. Thereafter, when the different categories of affiliates have been identified, it is possible to analyse some possible systematic variations between the identified categories in terms of integrated international production. We will therefore, first, identify variations between affiliates according to the mode of entry of affiliates, the absolute size of affiliates, the international strategy applied by the affiliate, and the Swedish industry clusters in which the affiliates operate, and, secondly, analyse whether these variations tend to affect the extent of internationally integrated production. The possible variations in internationally integrated production will be secured by comparing the different categories of affiliates using the seven research questions, presented in section 4.6, above.

7 MODE OF ENTRY

7.1 Introduction

In this chapter, an analysis is presented, taking into account that the extent of integrated production of TNCs might be affected by the mode of entry of individual affiliates. Broadly speaking, firms have two different ways to establish foreign operations. Firstly, the firm may set up a totally new operation through a green-field investment, or, alternatively, acquire an existing company. According to Caves (1982), setting up a new venture is usually more risky, but, in the long run, potentially more profitable. During the 1980s, mergers and acquisitions of already existing operations have been the major vehicle for firms expanding their activities abroad, although it is well recognised that not all acquisitions are likely to be successful, and in many situations the acquired firms are only marginally integrated with parent-firms, bringing no synergies of coordination (Sachwald 1994). The significance of acquisitions, in relation to green-field investments, as the main vehicle for expanding abroad during the last decade can be illustrated by the fact that out of total investments by foreign firms in the US during the 1980s, more than half were accounted for by acquisitions, and, in the early 1990s, acquisitions was responsible for as much as some 90 percent (UNCTAD-DTCI 1995). The growing importance of takeovers as the main means of expanding abroad is also demonstrated among Swedish TNCs, where the acquisition of existing companies has became the most important mode of international expansion in most regions and industries during the 1980s (Andersson et. al. 1996). Also among Japanese TNCs, which had traditionally relied upon green-field investments when entering the European market, acquisitions have increased during the early 1990s (Tsurumi 1976, Yamawaki 1994, Dunning 1994)

In terms of integration and control, it is often suggested that green-field investments are easier to integrate and tailor-made to fit the organization of parent-corporations, while acquired firms, on the other hand, normally bring their own technology and organizational structure and have established business relationships with customers and suppliers, hence, being more difficult to integrate with parent-corporation structures (Young et.al 1985). Furthermore, green-field investments are often seen as the traditional way by which TNCs implement and expand their firm-specific advantages across borders, often in the form of deliveries of intermediate products. Acquisitions, on the other hand, are increasingly used for acquiring what are perceived as new and complementary assets for the investing firm, either in terms of market assets or technological capabilities (Dunning 1995). In this situation, resource-flows and other capabilities may run, not only from the parent to their affiliates, as is the normal case in new start-ups, but also from the affiliates to parent-firms (Cantwell 1989)

The mode of establishment is also likely to affect the degree and structure of intra-firm trade between the affiliates and the rest of the corporation. At least initially, a

green-field affiliate is likely to be dependent on the parent-company in terms of material inputs and technological know-how. Acquired firms, on the other hand, normally have established business contacts with their own suppliers and customers. Therefore, at least initially, the degree of intra-firm deliveries among acquired firms and other parts of the parent-corporation, may be marginal or non-existent. Empirically, among Swedish TNCs, it has been shown that foreign affiliates that are acquired, are generally much less dependent on imports from parent-firms, compared to affiliates established as green-field investments (Andersson et.al 1996). For example, in 1990, green-field affiliates of Swedish TNCs imported, on average, 20 percent of total sales from parent-companies, compared to only 7 percent among acquired affiliates. This tendency of acquired affiliates to be less dependent on imports from parents is found to apply to both finished as well as intermediate products. Furthermore, the tendency of acquired affiliates to be less dependent on intra-firm imports are also indicated by the fact that, in 1990, 47 percent of acquired affiliates of Swedish TNCs had no imports from parent -firms, compared to 19 percent among green-field affiliates.

In time, however, the differences in terms of intra-firm trade between green field investment and acquisitions may diminish, as the former establish their own relations with external suppliers and customers, and the latter are integrated by parent-firms. Empirical analysis of intra-firm trade among affiliates of Swedish TNCs showed, however, no convergence between green-field affiliates and acquired firms in terms of intra-firm imports of intermediate products between 1974 and 1990 (Anderson et al. 1996). Concerning finished products, a convergence was identified, although this was mainly attributable to a diminished dependence on parent -firms' deliveries for finished products among green-field affiliates, rather than an increase in parent-firms' deliveries to affiliates that had been acquired. This suggests that most acquired affiliates, even after a considerable time-period, are only partly integrated by parent-corporations in terms of intra-firm deliveries of intermediate and finished products, while green-field affiliates often continue to be dependent on intra-firm deliveries of material inputs.

Finally, the empirical surveys of affiliates of Swedish TNCs also show that, in contrast to what is noticed for intra-firm imports, no differences have been identified between green-field and acquired affiliates in terms of intra-firm exports. This suggests that affiliates' sales are more easily integrated into the parent-organization compared to purchases of intermediate inputs.

Below, some empirical findings related to the second and third objectives of the study (set out in section 1.2), will be presented, i.e, firstly, to identify variations between affiliates according to the mode of entry, and, thereafter, analyse if these variations tend to affect the extent of internationally integrated production. Thus, the aim of the present chapter is: a) *to identify the proportion of MOFAs that have been established by means of green-field investments and aqcuisition, respectively* and b) *to analyse the extent in which integrated international production tends to vary between green-field and acquired affiliates.*

The possible variations in integrated international production will be studied by comparing green-field and acquired affiliates, focused on the seven research

questions, set out in section 4.6, above, i.e, to analyse: *i) exports and domestic sales, ii) intra-firm sales, iii) imports and domestic purchasing of material inputs, iv) intra-firm purchasing of material inputs, v) intra-corporate coordination of functional activities, vi) inter-firm and intra-corporate technological cooperation, vii) to what extent MOFAs operate as competence centres on behalf of parent- and sister-firms.*

The chapter is organized as follows. Section 7.2 starts with a presentation of the proportion of MOFAs that have been established by means of green-field investments and acquisitions. Thereafter, in order to see if there exists any systematic difference between these two categories of MOFAs in terms of export performance, section 7.3 analyses the geographical scope of sales-markets distinguishing between products that have been manufactured by individual affiliates in Sweden and those that are resold on behalf of parent- or sister-firms. Thereafter, section 7.4 discusses the extent and characteristics of integration through intra-firm sales, distinguishing between manufactured output in terms of finished products aimed at external customers, and products used as material inputs by parent- or sister-firms outside Sweden. In section 7.5 the extent in which material inputs are purchased from suppliers located in the Swedish host market, alternatively imported from suppliers located in different markets outside Sweden is discussed, while section 7.6 gives an account of the extent of backward vertical integration through intra-firm purchasing of material inputs from other parts of parent-corporation. After the findings concerning exports and intra-firm trade are presented, the chapter continues with an examination of some possible systematic variations between the two categories of MOFAs in terms of integration of other parts of the value chain. Section 7.7 shows variations between green-field and acquired affiliates in terms of intra-corporate coordination of various parts of their value chains. Section 7.8 presents comparisons between the two groups of affiliates in terms of inter-firm and intra-corporate technological cooperation in order to develop technological competence, while section 7.9 focuses on the extent in which the two groups operate as competence centres on behalf of other corporate firms outside Sweden. Finally, section 7.10 summarises and, as far as possible, discusses the most important findings of the chapter in relation to findings from other related studies.

7.2 Green-field investments and acquisitions

The proportion of MOFAs which have been established by means of green-field investments and acquisitions is presented in Table 7.1. This estimate has been derived simply by asking the respondents if their affiliate was incorporated into the present company by means of a green-field investment or was an acquisition. As can be seen, out of the 296 affiliates included in the study, as many as 257 (87%) have been incorporated into the present company by means of acquisitions, while only 39 (13%)

have been established through green-field investments. Of course, some of the acquired affiliates may have been established as a green-field investment by other foreign TNCs, and later acquired by the present parent-company. In the same table we also notice that three quarters of affiliates has been established since 1985, while only 12 percent has been established earlier than 1970. Acquired firms are especially dominating among those established since the mid 1980s, while green-field affiliates generally are of an earlier date.

Table 7.1 *Year of incorporation into present parent-corporation among MOFAs located in Sweden 1993, by mode of entry. Percent*

Mode of entry	-1969	1970-1979	1980-1984	1985-1989	1990-93	Total	N
Green-field investments	49	16	28	5	2	100	39
Acquisitions	7	12	10	39	32	100	257
TOTAL	12	13	13	34	29	100	296

Source: Survey data by the author

7.3 Exports and local sales

Turning to the sales-markets, it can be noticed that MOFAs established through green-field investments seem, to a substantial degree, to operate as marketing channels through resale of products made by parent- and sister firms, while acquired affiliates to only a marginal extent are involved in resale activities. Among green-field affiliates, over half (56%) indicate that they sell products on behalf of parent- and/or sister-firms, accounting for around one third of total sales. Among acquired MOFAs, almost half (49%) indicate that they are involved in resale activities, responsible for 10 percent of their total sales.

When focusing on manufactured sales, green-field affiliates are often suggested to be involved in host-market production. Indeed, among MOFAs in Sweden, green-field affiliates seem to focus significantly more on the domestic market, compared to acquired firms, see Table 7.2. While 60 percent of green field affiliates' manufactured sales are directed to the local Swedish market, corresponding figures for acquired

Table 7.2 *Manufactured sales in different markets among MOFAs located in Sweden 1993, by mode of entry. Percent.*

Mode of entry	Sweden	Nordic excl. Swe	Western Europe	Russia/ East Europe	North America.	Latin America.	Japan/ SE Asia	Rest of World	Total	N
Green-field investments	60	18	19	1	1	0	1	0	100	39
Acquisitions	47	11	26	1	6	1	6	3	100	257
TOTAL	47	11	25	1	6	1	6	2	100	296

Source: Survey data by the author

affiliates are 47 percent. If also the adjacent Nordic countries are included in the local market, it is found that almost 80 percent of manufactured sales of green-field affiliates can be classified as host market production. Acquired affiliates show a lower dependency on the total Nordic market, and at the same time are exporting 17 percent to markets outside Western Europe.

The tendency for acquired affiliates to be more involved in exports is also found in Table 7.3, showing that while as many as 93 percent of acquired affiliates are engaged in at least some exports, the corresponding figures for green-field affiliates are lower, or 72 percent. Furthermore, the proportion of affiliates that are export-intensive, selling most of their manufactured output in various international markets, is also much higher among acquired affiliates compared to green-field affiliates, or 41 percent and 26 percent, respectively.

Table 7.3 *Percent exports of manufactured sales by MOFAs located in Sweden 1993, by mode of entry. Percent of firms.*

Mode of entry	0%	1-10%	11-25%	26-50%	51-75%	76-100%	Total	N
Green-field investments	28	15	21	10	13	13	100	39
Acquisitions	7	15	17	19	17	24	100	257
TOTAL	10	15	18	18	16	23	100	296

Source: Survey data by the author

7.4 Intra-firm sales

Concerning intra-firm sales of manufactured output we find no substantial difference between green-field affiliates and acquired affiliates, see Table 7.4. While both categories of affiliates export around 45 percent internally, acquired affiliates are marginally more dependent of intra-firm sales as a proportion of total sales, reflecting the relatively higher export intensity among these affiliates, compared to green-field affiliates. In both categories of affiliates, intra-firm sales consist almost exclusively of finished products, while intra-firm sales of material inputs are marginal.

Table 7.4 *Percent intra-firm exports of manufactured sales and percent intra-firm exports of manufactured exports, by MOFAs located in Sweden 1993 by mode of entry.*

Mode of entry	Percent intra-firm exports of manufactured sales			Percent intra-firm exports of manufactured exports	N
	Finished goods	Material inputs	Total		
Green-field investments	20	1	21	47	39
Acquisitions	24	1	25	44	257
TOTAL	23	1	24	44	296

Source: Survey data by the author

As can be seen in Table 7.5 only marginal differences seem to exist in the proportion of intra-firm exports to total exports, between the two categories. While one third of green-field affiliates, as well as acquired affiliates, indicate that they do not export on an intra-firm basis, the proportion of green-field affiliates that exports mainly through intra-firm exports seem to be somewhat higher (43%), compared to acquired affiliates (33%).

Table 7.5 *Intra-firm exports of manufactured exports by MOFAs located in Sweden 1993, by mode of entry. Only affiliates with exports. Percent.*

Mode of entry	0%	1-10%	11-25%	26-50%	51-75%	76-100%	Total	N
Green-field investments	32	7	4	14	25	18	100	28
Acquisitions	32	7	10	18	14	19	100	238
TOTAL	32	7	10	18	15	19	100	266

Source: Survey data by the author

7.5 Imports and local purchasing of material inputs

As discussed above, green-field investment affiliates are, at least initially, often believed to be dependent on their parent-corporation's deliveries of materials, components and other inputs used in the production process, resulting in a substantial amount of imports of intermediate products. The information presented in Table 7.6 seems, in aggregate terms, to suggest that acquired affiliates focus somewhat more on sourcing material inputs in Sweden and in the Nordic market, while green-field affiliates to a comparably larger extent are sourcing inputs from suppliers in Western Europe. On the other hand, acquired MOFAs purchase a larger share of inputs in non-European markets.

Table 7.6 *Percent purchases of material inputs in different markets by MOFAs located in Sweden 1993, by mode of entry.*

Mode of entry	Sweden	Nordic excl. Swe	Western Europe	Russia/ East Eur.	North America	Latin America.	Jap/ SE Asia	Rest of World	Total	N
Green-field investments	38	10	51	0	2	0	0	0	100	39
Acquisitions	46	13	32	2	3	1	2	2	100	257
TOTAL	45	13	33	2	3	1	2	2	100	296

Source: Survey data by the author

7.6 Intra-firm purchasing

Part of the explanation why green-field affiliates are often found to import a proportionally larger share of inputs, compared to acquired affiliates, can be attributed to the fact that these affiliates, to a larger extent, are dependent on intra-firm deliveries from other parts of the parent-organisation. Also among MOFAs in Sweden it seems that green-field affiliates to a larger extent are engaged in intra-firm deliveries of material inputs, compared to acquired firms, see Table 7.7. While over 40 percent of all imports of intermediate product are purchased through intra-firm transactions in green-field affiliates, the corresponding figure for acquired affiliates is only 28 percent. Furthermore, in total 27 percent of all purchases of material inputs in green-field affiliates are internalized, while the corresponding figure for acquired affiliates is substantially lower, or 17 percent.

Table 7.7 *Intra-firm purchasing of total purchasing of material inputs, and intra-firm imports of total imports of material inputs by MOFAs located in Sweden 1993, by mode of entry. Percent.*

Mode of entry	Intra-firm purchasing of total purchases of material inputs	Intra-firm imports of total imports of material inputs	N
Green-field investments	27	41	39
Acquisitions	17	28	257
TOTAL	18	29	296

Source: Survey data by the author

The tendency for green-field affiliates to be more involved in intra-firm imports is also found in Table 7.8, which show that around three quarters of all green-field affiliates are involved in intra-firm imports, while less than half of acquired MOFAs are involved in intra-firm imports. In addition, almost one third of all green-field affiliates purchase most of their inputs from parent- or sister-firms abroad, indicating a high degree of vertical integration in terms of material linkages. By contrast, less than 20 percent of acquired affiliates buy most of their inputs from parent- or sister-firms abroad, indicating a substantially lower degree of vertical integration.

Table 7.8 *Percent intra-firm imports of total imports of material inputs, by MOFAs located in Sweden 1993, by mode of entry. Percent of firms.*

Mode of entry	0%	1-10%	11-25%	26-50%	51-75%	76-100%	Total	N
Green-field investments	36	8	17	8	8	23	100	39
Acquisitions	55	7	7	11	11	9	100	257
TOTAL	52	7	8	11	11	11	100	296

Source: Survey data by the author

7.7 Intra-corporate coordination of different functional activities

As was discussed above, green-field affiliates are often believed to be more integrated by parent-firms, compared to acquired firms. In table 7.9 it can be seen that green-field affiliates seem to be more coordinated by parent-corporations in up-stream value adding activities, e.g. R&D, procurements and manufacturing, while acquired firms seem to be more coordinated in down-stream activities, e.g. in marketing, sales, distribution and finance. Hence the table gives no clear indication that green-field investment affiliates generally are more coordinated with other parts of parent-corporations. Instead it seems that a major difference between the two types of affiliates exists concerning which of the functional activities that are coordinated.

Table 7.9 *Percent of MOFAs located in Sweden 1993, indicating intra-corporate coordination in different parts of the value chain, by mode of entry*

Coordinated activity	Green-field investments N=39	Acquisitions N=257
R&D	82	58
Procurement	38	30
Input quality control	20	8
Production	28	14
Output quality control	10	7
Marketing	31	45
Sales	13	31
Distribution	7	18
After-sales services	8	18
Finance	51	70
Administration	18	30

Source: Survey data by the author

The tendency for green-field affiliates to be relatively more integrated in up-stream value adding activities, compared to acquired MOFAs, is also clear in Table 7.10, which shows the most important resources that local managers of the affiliates

Table 7.10 *Type of intra-corporate received resources cited as being among the three most important in MOFAs located in Sweden 1993. Percent by mode of entry.*

Mode of entry	Product technology	Process technology	Other type of know-how	International marketing organization	International procurement organization	Corporate goodwill	Scale-economies	Finance	N
Green field	73	49	36	31	21	33	16	44	39
Acquisitions	43	33	36	48	23	33	23	61	257
TOTAL	47	25	36	45	22	33	21	57	296

Note: Total number of most important sources cited may not sum up to total number of firms, because some firms cited more, or, less, than three sources as most important.

Source: Survey data by the author

perceive that they receive from parent- and sister firms. Above all, three quarters of the managers in green-field affiliates indicate that resources related to product technology are among the three most important. In addition, resources related to process technology are indicated as being the most important by almost half of these affiliates. In acquired affiliates, on the other hand, resources related to finance and an international marketing organisation are indicated as being among the most important.

7.8 Inter-firm and intra-corporate technological cooperation

A basic difference between acquired firms and green-field investments is that while the former normally bring their own network of suppliers and customers, the supplier and customer structure of the latter firms have to be built up from the beginning, alternatively coordinated with existing supplier and customer structures of parent-firms. The extent in which green-field affiliates and acquired affiliates in Sweden differ in their involvement in organized technological cooperation with various types of partners is shown in Table 7.11. The general conclusion from these figures seems to be that acquired affiliates are less involved in technological cooperation with corporate firms abroad, and more with external firms and R&D institutions, compared to green-field affiliates. This is especially clear in relation to the degree of cooperation with corporate firms abroad, where almost three quarters of green-field affiliates indicate that this is organized to a large or very large extent with corporate firms abroad. The corresponding figure for acquired affiliates is only around one third. In relation to extensive technological cooperation with other types of partners, only smaller differences seem to exists between the two categories of MOFAs.

Table 7.11 *Percent of MOFAs located in Sweden 1993 indicating organized technological cooperation with other corporate firms, external firms (suppliers/customers) and R&D institutions, by mode of entry.*

Mode of entry	Corporate firms in Sweden	Corporate firms abroad	External firms in Sweden	External firms abroad	R&D inst-itutions in Sweden	R&D inst-itutions abroad
MOFAs indicating at least some technological cooperation						
Green-field affiliates	18	87	59	38	36	19
Acquisitions	30	80	77	62	47	18
MOFAs indicating "a large" or "very large" extent of technological cooperation						
Green-field affiliates	8	62	15	8	5	3
Acquisitions	12	37	19	9	3	2

Source: Survey data by the author

The tendency for green-field affiliates to be more reliant on parent-corporations in terms of technological competencies compared to acquired firms seems also to dominate among MOFAs located in Sweden. In Table 7.12, we find that green-field affiliates to a substantially higher degree seem to be dependent on parent-corporations in terms of technological competencies, as more than half of these affiliates indicate that corporate firms abroad are the main source for generating technological competencies. The corresponding figure for acquired affiliates is only 13 percent. Instead, acquired affiliates seem to be substantially less dependent on their parent-corporation for technological competence, as this is mainly generated internally.

Table 7.12 *Sources of technological competence cited as most important 1993 in MOFAs located in Sweden. Percent by mode of entry.*

Mode of entry	Internally generated competence	Corporate firms in Sweden	Corporate firms abroad	External firms in Sweden	External firms abroad	R&D institutions in Sweden	R&D institutions abroad	N
Green-field investments	46	3	51	8	0	0	0	39
Acquisitions	77	2	13	5	2	1	1	257
TOTAL	73	2	18	5	1	1	1	296

Note: Total number of most important sources cited may not sum up to total number of firms, because some firms cited more or less than three sources as most important.

Source: Survey data by the author

The relative importance that local managers give to corporate firms and external firms, as a source for generating their technological competence is indicated in Table 7.13, showing that green-field affiliates, again, to a substantially larger extent are dependent on corporate firms for generating technological competencies, compared to acquired affiliates. Almost 80 percent of green-field affiliates claim corporate firms

Table 7.13 *The relative importance of cooperation with external firms compared to corporate firms as a source for generating technology competence, among MOFAs located in Sweden 1993. Percent by mode of entry.*

Mode of entry	Cooperation with external firms in Sweden more important	Cooperation with external firms abroad more important	Cooperation with corporate firms in Sweden more important	Cooperation with corporate firms abroad more important	N
Green-field affiliates	18	0	3	79	39
Acquisitions	28	7	8	50	257
Total	27	6	7	54	296

Note: The balance is accounted for affiliates which indicated that external firms and corporate firms is equally important as technology generating sources. External firms: suppliers, customers, R&D institutions.

Source: Survey data by the author

abroad to be more important than external firms as a source for generating technological competencies. The corresponding figure among acquired affiliates is 50 percent. Instead, around one third of acquired affiliates suggest that cooperation with external firms, mainly located in Sweden, is more important than cooperation with corporate firms for generating their technological competence.

7.9 Indications of competence centres

In terms of competence centres, i.e affiliates which have received corporate responsibilities, no general difference between green-field affiliates and acquired affiliates can be identified, according to Table 7.14. In fact, the same proportion of affiliates, 23 percent, have received corporate responsibilities in at least one functional area.

Table 7.14 *Percent of affiliates with corporate responsibilities in MOFAs located in Sweden 1993, by mode of entry.*

Mode of entry	Affiliates with corporate responsibilities	Affiliates with no corporate responsibilities	Total	N
Green-field investment	23	77	100	39
Acquisition	23	77	100	257
TOTAL	23	77	100	296

Source: Survey data by the author

7.10 Summary

In this chapter we have analysed variations in integrated international production, distinguishing between affiliates established by means of acquisitions and green-field investments. Generally, it was presumed that acquired affiliates might be less integrated by parent-corporations, compared to green-field investments, due to the fact that acquired affiliates, before the takeover, have normally developed their own organisational structure and business relations with customers and suppliers. Green-field affiliates, on the other hand, are believed, at least initially, to be more dependent on the parent-company e.g. in terms of material inputs and technological know-how. Traditionally, many green-field affiliates, world-wide, have basically been host-market oriented, while acquired firms may be involved in a substantial amount of export activities prior to the takeover.

In the present study of MOFAs located in Sweden in 1993, it is found that, out of the 296 investigated affiliates, as many as 87 percent were found to be incorporated into the present corporation by means of take-overs, while only 13 percent were

green-field investments. Generally, acquired affiliates are younger, many having been established since the mid 1980s, while green-field affiliates, are generally, older. Turning to the main findings on variations in integrated international production according to the mode of entry, this is summarized in Table 7.15. First, green-field affiliates are substantially more involved in resale activities compared to acquired affiliates. While almost one third of total sales are generated through resale of products manufactured by parent- and sister-firms among green-field affiliates, the corresponding figure for acquired affiliates is only 12 percent.

In terms of manufactured products, acquired affiliates are substantially more involved in sales outside their host market in Sweden. Moreover, the export markets of acquired MOFAs are less focused on the neighbouring Nordic market, and more on Western Europe and Rest of the World, compared to green-field affiliates. Furthermore, a substantially larger proportion of the acquired affiliates are involved in export activities and a larger number of these affiliates can also be identified as export intensive, exporting most of their manufactured sales. In terms of intra-firm exports, no significant difference can be identified. In both categories, intra-firm exports consist almost exclusively of finished products, aimed at external customers, while intra-firm exports of material inputs for further processing by corporate firms are marginal. Moreover, the proportion of exports that are organized as intra-firm exports, as well as the proportion of exporting affiliates involved in intra-firm exports, are almost the same between the two types of affiliates.

These findings on exports by MOFAs in 1993, confirm those from the 1960s, (see section 3.12), which also showed that exports from Sweden were mainly performed by acquired affiliates, rather than by green-field affiliates. The findings showing that green-field and acquired MOFAs are involved in the same amount of intra-firm exports, are also in line with what has been identified among foreign affiliates of Swedish TNCs, see section 4.4.2.

In Sweden, green-field affiliates are found to be more involved in imports of material inputs compared to acquired affiliates. In part, this can be explained by the fact that green-field affiliates seem to be generally more vertically integrated through a higher share of intra-firm imports of material inputs. Also, the proportion of affiliates that are engaged in intra-firm imports is substantially higher among green-field compared to acquired affiliates. Again, these findings seem to be in line with what has been found among foreign affiliates of Swedish TNCs (see section 4.4.2), showing that acquired affiliates, on average, tend to be substantially less dependent of intra-firm imports compared to green-field affiliates. At the same time, a minority of acquired affiliates are involved in intra-firm imports, while most of green-field affiliates import material inputs from parent- and sister-firms.

When analysing differences between the two categories of MOFAs in terms of coordination of different parts of the value chain, a larger share of green-field affiliates seem to coordinate their up-stream activities, e.g. R&D, procurement and manufacturing, while a larger share of acquired affiliates seem to coordinate their

Table 7.15 *Characteristics of MOFAs located in Sweden 1993 by mode of entry*

	Acquisitions (N= 257)	Green-field investments (N=39)
Resale intensity (a)	12%	32%
Affiliates with resale of corporate products	49%	56%
Export intensity (b)	53%	40%
Geographical scope of exports (c)	Nordic 21%, WE 49%, ROW 32%	Nordic 45% WE 48% ROW 7%
Exporting affiliates	93%	72%
Export intensive affiliates (d)	41%	26%
Intra-firm exports (e)	44%	47%
Exporting affiliates with intra-firm exports	68%	68%
Import intensity (f)	54%	62%
Intra-firm imports (g)	28%	41%
Affiliates with intra-firm imports	45%	64%
Intra- corporate coordination	Finance, R&D and marketing	R&D, finance and procurement
Intra-corporate resource flows	Mainly finance, but also international marketing	Mainly product and process technology
Sources cited as most important for generating technological competence	77% Internal capacity 13% Corporate firms abroad	51% Internal capacity 46% Corporate firms abroad
Affiliates with extensive intra-corporate technological cooperation	37%	62%
Affiliates with extensive inter-firm technological cooperation	19%, mainly in Sweden	15%, mainly in Sweden
Affiliates claiming external- or corporate firms as more important for generating technological competence	50% Corporate firms 28% External firms in Sweden	79% Corporate firms 18% External firms in Sweden
Affiliates operating as competence centres	23%	23%

Note: For definitions of a-g, see Table 6.1

Source: Survey data by the author

down-stream activities, e.g. marketing, sales and distribution.

The tendency for green-field affiliates to be integrated mainly in up-stream value activities is also indicated by the fact that product and process technology are among the most frequently cited resources which these affiliates receive from parent- and sister-firms. Acquired affiliates, on the other hand, claim for the most part that financial and marketing resources are among the most important resources received from other parts of the parent-corporation.

In terms of affiliates' technological competence, substantial variations seem to exist between the two categories of affiliates. For example, less than half of green-field affiliates claim that their technological capacity is basically internally generated, while more than half indicate that parent- and sister-firms abroad are the most important source for generating technological competence. Among acquired affiliates, on the other hand, over three quarters claim that their technological competence is mainly generated internally, while only around ten percent claim that other corporate firms abroad are the main technology-generating source.

The tendency for green-field affiliates to be relatively more dependent on parent- and sister-firms in terms of technological competency is also indicated by the fact that around two thirds of these affiliates seem to be involved in a substantial amount of organized intra-corporate technological cooperation. Among acquired affiliates substantially fewer seem to be involved in organized technological cooperation with other parts of parent-corporation. It was also found that the relative importance of corporate firms in relation to external firms as sources of generating technological competencies seem to vary between the two categories of affiliates. While almost 80 percent of green-field affiliates claimed corporate firms abroad as being more important than external firms as a source for generating technological competencies, the corresponding figure for acquired affiliates was only 50 percent. At the same time almost 30 percent of acquired affiliates indicated that customers, suppliers and R&D institutions in Sweden were more important than parent- and sister-firms for generating technological competence, while the corresponding figure for green-field affiliates was less than 20 percent. Together these findings suggest that green-field affiliates seem to be substantially more integrated and dependent on other parts of parent-corporation for their technological competence, compared to acquired affiliates.

Finally, in terms of the share of affiliates indicating that they operate as competence centres, no difference was found between the two groups of affiliates.

8. SIZE OF AFFILIATES

8.1 Introduction

In this chapter, an analysis of the extent of integrated production in MOFAs according to the size of the affiliates is presented. Normally, the size of affiliates is concentrated upon when investigating the market structure of industries and countries characterized by significant FDI. It is often suggested that affiliates of foreign-owned TNCs tend to be larger in size than indigenous competitors in similar economic sectors (Steuer et al. 1973, Dunning 1976, 1985, Parry 1980, Lewcraw 1985, Willmore 1986). Caves (1974) suggests that a major reason for this might be the affiliates' access to economies of large scale production through a concentration on manufacturing of certain products to one or few affiliates of an international corporation. Because of this, TNCs seem less likely than new-established domestic firms, to set up affiliates below optimum size. However, other surveys, concerning both developed, as well as developing countries, also suggest that affiliates that are truncated versions of their parent-companies, producing for the host market, are often smaller than their local counterparts (Dunning 1993).

Partly as result of the increasingly used method of expansion by means of acquisitions of existing companies, partly as a result of the growth of many foreign-located affiliates over the years, many of these firms are today large entities (OECD 1994), controlling not only manufacturing operations, but also a host of other activities, including marketing and R&D. As a result, these large affiliates may be able to operate more independently from parent-firms, since larger affiliates are often believed to control a larger set of organizational, managerial and marketing capabilities compared to smaller affiliates (Hedlund 1981, Young et al 1985, Dunning 1993). Also, the export-intensity of larger affiliates may be higher, compared to smaller affiliates, since one of the main objectives of using foreign-located affiliates for export is based on scale economies and specialisation (Krugman 1990, 1991). Empirical surveys also suggest that the export propensity and the size of the affiliate are positively correlated (Andersson and Fredriksson 1994).

Below, some empirical findings related to the second and third objectives of the study (set out in section 1.2), will be presented, i.e, firstly, to identify variations between affiliates according to their absolute size, and, thereafter, to analyse if these variations tend to affect the extent of internationally integrated production. Thus, the aim of the present chapter is: a) *to identify the proportion of MOFAs according to the absolute size of affiliates,* and b) *to analyse the extent in which integrated international production tends to vary between larger and smaller MOFAs.*

The possible variations in integrated international production will be studied by comparing larger and smaller affiliates, focused on the seven research questions, set out in section 4.6, above, i.e to analyse: i) *exports and domestic sales,* ii) *intra-firm sales,* iii) *imports and domestic purchasing of material inputs,* iv) *intra-firm*

purchasing of material inputs, v) *intra-corporate coordination of functional activities,* vi) *inter-firm and intra-corporate technological cooperation,* vii) *to what extent MOFAs operate as competence centres on behalf of parent- and sister-firms.*

The chapter is organized in a similar way as chapter 7, above. Section 8.2 starts with a presentation of the break-down of MOFAs according to the absolute size of individual affiliates. Thereafter, section 8.3 analyses possible variations in export performance between larger and smaller MOFAs, distinguishing between products that have been manufactured by the individual affiliates in Sweden and those that are resold on behalf of parent- or sister-firms. Thereafter, section 8.4 discusses the extent and characteristics of integration through intra-firm sales, distinguishing between manufactured output in terms of finished products aimed at external customers, and products used as material inputs by parent- or sister-firms outside Sweden. Section 8.5 discusses the extent in which material inputs are purchased from suppliers located in the Swedish host market, alternatively imported from suppliers located abroad, while section 8.6 gives an account of the extent of backward vertical integration through intra-firm purchasing of material inputs from other parts of the parent-corporation. Thereafter, the chapter continues with an examination of some possible systematic variations between larger and smaller MOFAs in terms of integration of other parts of the value chain. Section 8.7 shows variations between larger and smaller affiliates in terms of intra-corporate coordination of different parts of their value chains. Section 8.8 presents comparisons between the two groups of affiliates in terms of inter-firm and intra-corporate technological cooperation in order to develop technological competence, while section 8.9 focuses on the extent in which the two groups of MOFAs tend to operate as competence centres on behalf of other corporate firms outside Sweden. Finally, section 8.10 summarises and, as far as possible, discusses the most important findings of the chapter in relation to other related studies.

8.2 Larger and smaller affiliates

In order to analyse the extent of variation of integrated production between affiliates of different size, we distinguish between affiliates with up to 100 employees, identified as smaller affiliates, on the one hand, and affiliates with over 100 employees, identified as larger affiliates, on the other. The size of the affiliates relates only to employee figures, although it is well recognized that alternative measurements such as market share, total sales figures, or total asset figures, also can be used (Bannock 1981, McGee 1989). The main motivation for using employment figures when defining the size of affiliates is based on the fact that this facilitates comparisons with other surveys of TNCs, as well as with domestic firms in Sweden. Since no absolute definition of what characterizes small, medium-sized or large firms, is available (Thompson and Leyden 1983), the cutoff of 100 employees for distinguishing between smaller and larger affiliates is chosen quite arbitrarily. However, it is broadly

in line with methods applied by the EU (The European Observatory for SMEs 1993) and Statistics Sweden when distinguishing smaller firms from larger.

The size-distribution of MOFAs according to employment was presented in Table 2.4, above, showing that half of the affiliates employ 100 or less persons, while an equally large share of affiliates employ over 100 persons. Thus, the findings of the present chapter distinguish between two categories, larger and smaller affiliates; each category containing 148 affiliates.

8.3 Exports and local sales

Before presenting the findings of manufactured sales, it can be noticed that the smaller MOFAs to a greater extent operate as marketing channels through resale of products made by parent- and sister-firms, compared to the larger affiliates. Among the smaller MOFAs, almost half (47%) sell products on behalf of parent- and sister-firms, accounting for 21 percent of total sales. Among larger MOFAs, 53 percent indicate that they are involved in resale activities, responsible for 12 percent of their total sales.

Turning to manufactured sales, Table 8.1 shows that larger affiliates are more export-orientated compared to smaller affiliates. While the larger affiliates export 56 percent of their manufactured output, the smaller affiliates' export share is 40 percent. The larger affiliates' sales in Western Europe, North America and Japan/South East Asia are generally larger, while the proportion of total manufactured sales going to the Nordic market, Russia/East Europe, Latin America and Rest of World is of a comparable size.

Table 8.1 *Percent manufactured sales in different markets by MOFAs located in Sweden 1993 by size of affiliate.*

Size of MOFA	Sweden	Nordic excl. Swe	Western Europe	Russia/ East Europe	North America	Latin America	Japan/ SE Asia	Rest of world	Total	N
Larger	46	11	27	1	6	1	6	2	100	148
Smaller	60	12	17	2	3	1	3	2	100	148
TOTAL	47	11	25	1	6	1	6	2	100	296

Source: Survey data by the author

The tendency of larger affiliates to be more involved in export activities is also found in Table 8.2, which shows that almost none of the larger affiliates can be identified as non-exporters, compared to almost one fifth of the smaller MOFAs. At the same time, almost half of the larger affiliates are export intensive, exporting most of their manufactured output, while the share of export-intensive firms among the smaller affiliates is only around one third.

Table 8.2 *Percent manufactured exports by MOFAs located in Sweden 1993. Percent of affiliates by size.*

Size of MOFA	0%	1-10%	11-25%	26-50%	51-75%	75-100%	Total	N
Larger	3	16	15	20	18	28	100	148
Smaller	17	15	20	16	15	17	100	148
TOTAL	10	15	18	18	16	23	100	296

Source: Survey data by the author

8.4 Intra-firm sales

In terms of intra-firm exports, the findings in Table 8.3 suggest that larger affiliates are more integrated compared to smaller MOFAs. Given that larger MOFAs, are more export-intensive compared to smaller affiliates, the extent of intra-firm exports as percent of total sales is also found to be highest among the larger affiliates. Looking only to the share of exports that are internalized, we also see that this is higher among the larger affiliates compared to the smaller, or 45 percent and 37 percent respectively.

Table 8.3 *Percent intra-firm exports of manufactured sales, and, percent intra-firm exports of manufactured exports, by MOFAs located in Sweden 1993, by affiliate size*

Size of MOFA	Percent intra-firm exports of manufactured sales			Percent intra-firm exports of manufactured exports	N
	Finished goods	Material inputs	Total		
Larger	24	1	25	45	148
Smaller	14	1	15	37	148
TOTAL	23	1	24	44	296

Source: Survey data by the author

Furthermore, Table 8.4 shows that while as many as three quarters of the larger affiliates export, at least to some extent, on intra-firm basis, the corresponding figure for the smaller affiliates is 60 percent. A higher share of the larger affiliates are also exporting most of their manufactured output on an intra-firm basis.

Table 8.4 *Intra-firm exports in total manufactured exports among MOFAs located in Sweden 1993, by size of affiliates. Only firms with exports.*

Size of MOFA	0%	1-10%	11-25%	26-50%	51-75%	76-100%	N
Larger	24	8	9	19	19	21	142
Smaller	40	5	10	17	10	18	124
TOTAL	32	7	10	18	15	19	266

Source: Survey data by the author

8.5 Imports and domestic purchasing of material inputs

In terms of material purchases, larger affiliates rely somewhat more on suppliers located in the local Swedish market, see Table 8.5. Almost half of the total purchases by larger affiliates originate from suppliers in Sweden, compared to around 40 percent among smaller affiliates. The smaller affiliates show instead a slightly higher share of total purchases from suppliers located in Western Europe.

Table 8.5 *Percentages purchases of material inputs in different markets by MOFAs located in Sweden 1993 by size of affiliate.*

Size of MOFA	Sweden	Nordic excl. Swe	Western Europe	Russia/ East Europe	North America	Latin America	Japan/ SE Asia	Rest of world	Total	N
Larger	46	13	33	2	3	0	2	2	100	148
Smaller	39	14	38	1	2	4	1	2	100	148
TOTAL	45	13	33	2	3	1	2	2	100	296

Source: Survey data by the author

The proportion of affiliates which can be identified as non-importers do not seem to vary to any larger extent according to affiliates' size, as indicated in Table 8.6. A larger share of the smaller MOFAs seem, however to be import-intensive, i.e. import most of their material inputs.

Table 8.6 *Percent imports of total purchases of material inputs by MOFAs located in Sweden 1993. Percent of affiliates by size.*

Size of MOFA	0%	1-10%	11-25%	26-50%	51-75%	76-100%	Total	N
Larger	2	7	19	31	20	21	100	148
Smaller	7	10	12	18	16	36	100	148
TOTAL	5	8	16	25	18	29	100	296

Source: Survey data by the author

8.6 Intra-firm purchases

As seen above, larger affiliates were found to internalize a larger share of total sales and exports. At the same time, the smaller affiliates seem to internalize a higher share of purchases of material inputs according to Table 8.7. Around one fourth and one third of total purchases and imports, respectively, are organized as intra-firm deliveries in smaller affiliates, compared to 17 and 28 percent in larger affiliates.

Table 8.7 *Intra-firm purchasing of total purchasing of material inputs, and intra-firm imports of total imports of material inputs by MOFAs located in Sweden 1993, by size of affiliates. Percent.*

Size of MOFA	Intra-firm purchasing of total purchases of material inputs	Intra-firm imports of total imports of material inputs	N
Larger	17	28	148
Smaller	26	35	148
TOTAL	18	29	296

Source: Survey data by the author

The tendency for smaller affiliates to internalize their material purchases to a greater extent, compared to larger affiliates is also pronounced in Table 8.8, which shows that 55 percent of the larger affiliates have no intra-firm imports, compared to almost half of the smaller affiliates. Furthermore, if we focus on the share of affiliates internalizing most of their imports of material inputs, we see that only 17 percent of larger affiliates are highly dependent on corporate firms abroad for deliveries of materials, parts and components, compared to 27 percent among the smaller affiliates.

Table 8.8 *Percent intra-firm imports of total imports of material inputs 1993, by MOFAs located in Sweden. Percent by size of affiliates.*

Size of MOFA	0%	1-10%	11-25%	26-50%	51-75%	76-100%	Total	N
Larger affiliates	55	10	8	11	9	8	100	148
Smaller affiliates	49	4	7	11	13	14	100	148
TOTAL	52	7	8	11	11	11	100	296

Source: Survey data by the author

8.7 Intra-corporate coordination of different functional activities

Generally, larger affiliates coordinate their different value-adding activities with parent- and sister-firms to a somewhat greater extent compared to smaller affiliates, see Table 8.9. Only in terms of input and output-quality control and production tend smaller affiliates coordinate their operations to a larger extent.

According to the opinions of local managers, among the larger affiliates, the most important resources provided by parent- and sister-firms relate basically to financial resources and secondly to an international marketing organisation, see Table 8.10. Among the smaller affiliates, resources related to product technology and financial resources seem most important.

Table 8.9 *Percent of MOFAs located in Sweden 1993 indicating intra-corporate coordination in different parts of the value chain, by size of affiliate.*

Coordinated activity:	Larger affiliates (N=148)	Smaller affiliates (N=148)
R&D	64	58
Procurement	36	26
Input quality control	2	17
Production	15	18
Output quality control	4	10
Marketing	48	39
Sales	32	25
Distribution	19	14
After-sale services	20	14
Finance	77	57
Administration	34	24

Source: Survey data by the author

Table 8.10 *Type of intra-corporate received resources cited as being among the three most important in MOFAs located in Sweden 1993. Percent by size of affiliate.*

Size of MOFA	Product technology	Process technology	Other type of know-how	International marketing organization	International procurement organization	Corporate goodwill	Scale-economies	Finance	N
Larger	40	27	36	51	22	39	27	60	148
Smaller	55	24	36	41	22	39	16	54	148
Total	47	25	36	45	22	33	21	57	296

Note: Total number of most important sources cited may not sum up to total number of firms, because some firms cited more, or, less, than three sources as most important.

Source: Survey data by the author

8.8 Inter-firm and intra-corporate technological cooperation

Generally, Table 8.11 suggests that larger MOFAs are engaged to a somewhat larger extent in technological cooperation with external firms as well as with corporate firms abroad, although a somewhat larger dependence on corporate firms for generating technological competencies can be seen in smaller affiliates, see Table 8.12. While around three quarters of larger MOFAs claim that their technological competence is internally generated, the corresponding figure for smaller affiliates is around two thirds. We see also that around one fifth of the smaller affiliates claim corporate firms abroad as being the most important source for generating technological capabilities. The corresponding figure for the larger affiliates is only 15 percent.

Table 8.11 *Organized technological cooperation with other corporate firms, external firms (suppliers/customers) and R&D institutions. Percent of of each type of affiliates among MOFAs located in Sweden 1993 by affiliate size.*

Size of MOFA	Corporate firms in Sweden	Corporate firms abroad	External firms in Sweden	External firms abroad	R&D inst-itutions in Sweden	R&D inst-itutions abroad
Affiliates indicating at least some technological cooperation						
Larger affiliates	29	84	84	67	56	23
Smaller affiliates	28	78	66	51	35	13
Affiliates indicating "a large" or "very large" extent of technological cooperation						
Larger affiliates	10	44	20	11	3	2
Smaller affiliates	12	39	16	7	5	1

Source: Survey data by the author

Table 8.12 *Sources of technological competence cited as most important by MOFAs located in Sweden 1993. Percent among affiliates of different sizes.*

Size of MOFA	Internally generated competence	Corporate firms in Sweden	Corporate firms abroad	External firms in Sweden	External firms abroad	R&D institutions in Sweden	R&D institutions abroad	N
Larger	77	2	15	4	2	1	0	148
Smaller	67	2	21	7	1	1	1	148

Note: Total number of most important sources cited may not sum up to total number of firms, because some firms cited more than one source as most important, or, that no most important source was cited

Source: Survey data by the author

According to Table 8.13, a majority of affiliates in both size categories indicate that corporate firms abroad are the main partners for generating technological competencies. We see also that the smaller affiliates to a somewhat larger extent claim

Table 8.13 *The relative importance of cooperation with external firms compared to corporate firms as a source for generating technological competence among MOFAs located in Sweden 1993 by size of affiliates.*

Size of MOFA	Cooperation with external firms in Sweden more important	Cooperation with external firms abroad more important	Cooperation with corporate firms in Sweden more important	Cooperation with corporate firms abroad more important	N
Larger	24	7	4	57	148
Smaller	29	5	10	51	148
Total	27	6	7	54	296

Note: The balance is accounted for affiliates which indicated that external firms and corporate firms is equally important as technology generating sources. External firms: suppliers, customers, R&D institutions.

Source: Survey data by the author

cooperation with external firms, as well as corporate firms in Sweden as being relatively most important for generating technological competencies. The larger affiliates, on the other hand, claim to a larger extent that cooperation with corporate firms abroad is the most important.

8.9 Indication of competence centres

A relatively higher share of MOFAs which operate as competence centres can be noticed among the larger compared to smaller affiliates, see Table 8.14. While around 30 percent of the larger affiliates seem to operate as competence centres in any functional area, the corresponding figure for smaller MOFAs is around half of this, or 16 percent.

Table 8.14 *Percent of foreign-owned affiliates in Sweden in 1993 which have received corporate responsibilities in different functional areas, by affiliate size.*

Size of MOFA	Affiliates with corporate responsibilities	Affiliates with no corporate responsibilities	N
Larger	29	71	148
Smaller	16	84	148
TOTAL	23	77	296

Source: Survey data by the author

8.10 Summary

In this chapter we have analysed variations in integrated international production between larger affiliates, i.e. affiliates with 100 employees, or more, and smaller affiliates, i.e. affiliates with up to 100 employees. Out of the total 296 affiliates included in the study, 50 percent were identified as large, while another 50 percent were identified as small. Generally it was suspected that larger affiliates tend to be less integrated by the parent corporation, due to the fact that they are believed to control a larger set of organizational, managerial and marketing capabilities, compared to smaller affiliates, which tend to result in the larger affiliates operating more autonomously from the parent-corporation. Larger affiliates were also believed to be more export-orientated compared to smaller affiliates, since much of today's exports between developed countries are motivated by scale economies.

The main findings on variations in integrated international production according to the size of affiliates are summarized in Table 8.15. Firstly, in terms of resale of corporate products, in aggregate terms, the smaller affiliates seem to operate as a marketing and distribution channel for parent- or sister-firms to a substantially greater

Table 8.15 *General characteristics of MOFAs located in Sweden 1993 by size of affiliates.*

	Larger affiliates (N=148)	Smaller affiliates (N=148)
Resale intensity (a)	12%	21%
Affiliates with resale of corporate products	53%	47%
Export intensity (b)	54%	40%
Geographical scope of exports (c)	Nordic 20% WE 50% ROW 30%	Nordic 30% WE 43% ROW 30%
Exporting affiliates	97%	83%
Export intensive affiliates (d)	46%	32%
Intra-firm exports (e)	45%	37%
Exporting affiliates with intra-firm exports	76%	60%
Import intensity (f)	54%	61%
Intra-firm imports (g)	28%	35%
Affiliates with intra-firm imports	45%	51%
Intra- corporate coordination	Generally more indicates coordination. Mainly finance, R&D and marketing	Generally fewer indicates coordination. Mainly finance, R&D and marketing
Intra-corporate resource flows	Mainly finance and marketing	Mainly product-technology and finance
Sources cited as most important for generating technological competence	77% Internal capacity 15% Corporate firms abroad	67% Internal capacity 21% Corporate firms abroad
Affiliates with extensive intra-corporate technological cooperation	44%	39%
MOFAs with extensive inter-firm technological cooperation	20%, mainly in Sweden	16% mainly in Sweden
MOFAs claiming external- or corporate firms as more important for generating technological competence	57% Corporate firms 24% External firms in Sweden	51% Corporate firms 29% External firms in Sweden
Affiliates operating as competence centres	29%	16%

Note: For definitions of a-g, see Table 6.1

Source: Survey data by the author

extent than larger affiliates.

In terms of manufactured products, larger affiliates are more export-orientated than smaller affiliates. At the same time, the export markets of larger affiliates are less focused on the Nordic market, and more on the Western European market, compared to smaller affiliates. Moreover, among the larger affiliates, a larger number are involved in export activities, and a larger number are also found to be export intensive, exporting most of their manufactured output. Together these findings give empirical support to established theory (4.2), suggesting that exports from foreign affiliates are associated with large affiliates, which empirically has also been found among foreign affiliates of Swedish and US TNCs. These findings on exports by MOFAs in 1993, seems also to confirm findings from the 1960s, which showed that exports from Sweden were mainly performed by large, rather than small, affiliates, see section 3.11.

Contrary to what was suspected in section 8.1, above, only partial empirical support for the idea that larger affiliates tend to operate more autonomously compared to smaller affiliates, can be found among MOFAs located in Sweden. For example, as regards their export activities, larger affiliates seem, on average, to be more integrated with parent-corporations, indicated by a higher proportion of manufactured exports to parent- or sister-firms abroad, compared to smaller affiliates. It can also be seen that among those affiliates that are involved in export activities, a proportionally higher share of the larger affiliates are exporting on an intra-firm basis. In terms of intra-firm exports, in both categories of affiliates this consists almost exclusively of finished products, aimed at external customers, while intra-firm exports of material inputs for further processing by corporate firms are marginal.

Looking at purchasing of material inputs, on a whole, it is found that smaller affiliates, import these to a greater extent compared to larger affiliates. One explanation for this seems to be related to the fact that the smaller affiliates' imports of material inputs are purchased from parent- or sister-firms abroad through intra-firm imports, to a greater extent compared to larger affiliates. A larger share of the smaller affiliates are also engaged in intra-firm imports of inputs.

Concerning intra-corporate integration of other parts of the value-chain, a majority of both the larger and the smaller affiliates indicated that they coordinate the finance and R&D functions with parent- and sister-firms abroad. In both categories of affiliates, a relatively higher share also indicated that they coordinate the marketing function. In general terms it seems that a proportionally higher share of the larger affiliates claim that they coordinate different parts of their value chain with parent- and sister-firms abroad.

In terms of coordination of different parts of the value-chain, among the larger, as well as smaller, affiliates, most MOFAs coordinate their finance, R&D and marketing functions, with parent- and sister-firms. This coordination is most prevalent in the larger affiliates.

In relation to sources for generating technological competence, it is difficult to draw any general conclusions. On the one hand, a greater share of the larger affiliates

claim that their technological competence is mainly generated internally by themselves, while a greater share of the smaller affiliates indicate that corporate firms abroad are the most important source for generating technological competence. Access to product technology, together with financial assets, are also indicated by the smaller affiliates as the most important resource these affiliates receive from parent- and sister-firms outside Sweden, while the larger affiliates indicate that access to marketing, and financial resources are the most important. At the same time, it can also be seen that the larger affiliates to a somewhat greater extent are involved in extensive cooperation with parent- and sister-firms abroad, as well as with suppliers and customers in Sweden, when generating technological competence. These identified differences between larger and smaller affiliates, related to generating technological competence, are however weak, and make any general conclusions problematic. Finally, in terms of affiliates operating as competence centres it seems that larger affiliates have received substantially more corporate responsibilities, compared to smaller affiliates.

9 INTERNATIONAL STRATEGIES

9.1 Introduction

Partly because of industry specific conditions, partly because of government induced policies, many TNCs uses a range of international strategies when operating in various host markets. In some industries, such as the consumer packaged goods industry, the competitiveness of firms in large is based on a national responsiveness to local preferences, giving managers of foreign-located affiliates a substantial amount of autonomy, while in the automobile industry the competitiveness of firms is critically dependent on the ability to coordinate a number of interdependent large-scale operations, world wide. Although relatively few attempts have been made to empirically analyse the extent in which foreign-located affiliates operate with a variety of international strategies, as was discussed above (chapter 4), existing findings suggest a growing tendency among TNCs to organize their international operations in a coordinated fashion, where individual affiliates are integrated with the operations of sister and parent-firms, rather than being managed autonomously. Below, an analysis will be presented focusing on the extent in which MOFAs located in Sweden tend to operate with different international strategies and how this may affect the affiliates' level of involvement in integrated international production.

In the present chapter, some empirical findings related to the second and third objectives of the study (set out in section 1.2), will be presented, i.e, firstly, to identify variations between affiliates operating with various international strategies, and, thereafter, to analyse the extent in which these variations tend to affect the extent of internationally integrated production

Thus, the aim of the present chapter is: a) *to identify the proportion of MOFAs operating with various international strategies,*and b) *to analyse the extent in which integrated international production tends to vary between MOFAs operating with various international strategies.*

The possible variations in integrated international production will be studied by comparing MOFAs operating with various international strategies, focused on the seven research questions, set out in section 4.6, above, i.e to analyse: i) *exports and domestic sales,* ii) *intra-firm sales,* iii) *imports and domestic purchasing of material inputs,* iv) *intra-firm purchasing of material inputs,* v) *intra-corporate coordination of functional activities,* vi) *inter-firm and intra-corporate technological cooperation,* vii) *to what extent MOFAs operate as competence centres on behalf of parent- and sister-firms.*

The chapter is organized as follows. Section 9.2 starts with a review of some earlier studies of affiliates operating with a variety of strategical roles. In section 9.3 an analysis of different international strategies among MOFAs located in Sweden is presented, based on a typologization which, in part, is derived from the reviewed literature on affiliates operating with different strategical roles. Thereafter, in order to

see if any systematic differences exists between MOFAs in terms of export performance according to the international strategies of the affiliates, section 9.4 analyses the geographical scope of sales-markets, distinguishing between products manufactured by the individual affiliates in Sweden and those that are resold on behalf of parent- or sister-firms. Thereafter, section 9.5 discusses the extent and characteristics of integration through intra-firm sales, distinguishing between manufactured output in terms of finished products aimed at external customers, and products used as material inputs by parent- or sister- affiliates outside Sweden. Section 9.6 discusses the extent in which material inputs are purchased from suppliers located in the Swedish host market, alternatively imported from suppliers located in different markets outside Sweden, while section 9.7 gives an account of the extent of backward vertical integration through intra-firm purchasing of material inputs from other parts of the parent-corporation. Thereafter, the chapter continues with an examination of some possible systematic variations between MOFAs operating with various international strategies in terms of integration of other parts of the value-chain. Section 9.8 shows variations between affiliates in terms of intra-corporate coordination of different parts of their value-chains. Section 9.9 presents comparisons between affiliates in terms of inter-firm and intra-corporate technological cooperation in order to develop technological competence, while section 9.10 focuses on the extent in which MOFAs operating with different international strategies, tend to operate as competence centres on behalf of other corporate firms outside Sweden. Finally, section 9.11 summarises and, as far as possible, discusses the most important findings of the chapter in relation to findings from other related studies.

9.2 The differentiation of strategical roles of affiliates

Relatively few attempts have been made to empirically analyse the degree in which foreign located affiliates of TNCs operate with different strategical responsibilities, and how this affects the integration of affiliates and host country economies (for a review of a number of such studies, see Etemad and Dulude 1986). One of the first, and most influential, attempts to analyse different strategical roles given to foreign affiliates is made by White and Poynter (1984). Mainly based on data from American affiliates in Canada, they found that the business strategies pursued by foreign-owned affiliates fell into relatively broad and distinct categories defined by the activities of the affiliates with regard to three dimensions: i) the product scope, i.e. the latitude exercised by affiliate business with regard to product lines, ii) the market scope, i.e the range of geographical markets available to the affiliate, and iii) the value-added scope, which refers to the range of ways an affiliate adds value, e.g. whether through R&D, manufacturing or marketing.

The outcome of different strategies implemented by the TNCs, tended to result in five types of affiliates. The first category, the marketing satellite business, is restricted to marketing into the trading area products which are manufactured centrally in the

TNC. Packaging, bulk-breaking and some simple final processing may occur at the subsidiary, while process and product development usually occur at central locations. These affiliates range from simple importing companies acting principally as wholesalers, to sophisticated marketers with extensive distribution, marketing, and sales services. This strategy is viable when a standardized global product, serving multiple markets, has tangible characteristics sufficiently close to local preferences and often includes computer-, pharmaceutical- and auto firms.

The second category of affiliates, the miniature replica, ideally produces and markets some of the parents' product lines or related product lines into the local market. This is a common type in industries characterized by unique local preferences in demand, import barriers, local manufacturing subsidies, high transportation cost, or low economy of scale. Value-added activities related to R&D may be conducted by other parts of the TNC, and adopted by the affiliate. Examples are often found in the consumer packaging goods-industry. Depending on the degree of product and marketing modifications performed by the affiliate, three sub-strategies can be performed, with a natural progression from adopters to adapters, and finally to innovators.

The third category, the rationalized manufacturer, has a limited product- and value-added scope, producing mainly a designated set of component parts or products for a multi-country or global market. This type of affiliate can be vertically integrated, as output may be further processed by other parts of the TNC. Generally, development activities are undertaken by the parent-company, but occasionally specific process improvements may be developed locally, while the strategy decisions related to capacity and new products are often controlled by the local plant. This strategy is implemented when input costs, scale economies, or product standardization encourages centralized production, servicing several markets, and usually includes OEM auto companies, auto parts manufacturers, aircraft companies and some petrochemical businesses.

The next category, the product specialist, typically develops, produces, and markets a limited product line, often related to the core business of the parent, for global markets. The product-specialist is generally self-sufficient by way of applied R&D, production and marketing, and exercises strategic control over its established products. Examples of this type of subsidiary are usually to be found in the transmission-, heavy equipment-, and electrical motor industries.

The last category of subsidiaries identified by White and Pointer is the strategic independent affiliate. These usually have the freedom and resources to develop new unrelated product lines of business, by way of either internal development or acquisition, for either a local, multi-country or global market. The principal links with the parent-company are mostly restricted to administration- and financial relations, where the parent-firm often assumes the role of passive investor. Examples of this type include most affiliates of conglomerate TNCs.

Some of the most extensive empirical surveys on the variations of affiliate

strategies among TNCs in Europe are provided by Hood and Young who, in a number of studies, draw on the organizational strategies of mainly US affiliates in Europe, especially England and Scotland. Historically, four relatively distinct phases can be identified in the transition of US affiliates located in Europe in the Post-War era (Hood and Young 1987). During the first phase, up to the 1950s, American firms in Europe, have been found to be of a marketing satellite-type, where the subsidiaries' responsibilities mainly were restricted to marketing on the local market products, made in the USA. During phase two, the 1950s and 1960s, subsidiaries were gradually given more production responsibility. These manufacturing-subsidiaries, often the first production-base of many US companies in Europe, were mainly established through green-field investments, normally strictly controlled in a manner of miniature-replicas, which produces and markets some of the parent-companies' product-lines or related product-lines on the local market. In phase three, late 1960s to early 1970s, the production base of many American TNCs also expanded to continental Europe, mainly as a consequence of tariff barriers erected by the EEC. (Young and Hood 1976). The strategies of American TNCs in Europe during this period could be said to be country-centred, with each subsidiary managed in a non-integrated manner and with restricted geographical market responsibility.

The country-centred strategies of many American firms during the third phase soon became inefficient and hence short-lived, mainly due to stiffening competition from many Japanese and European firms, together with new integration possibilities opened up by the revolution in the distance shrinking information-technology during the end of the 1970s. During the fourth phase, at the end of 1970s, many American firms did try to start organizing their subsidiaries' activities strictly along product-lines as rationalized manufacturers, where manufacturing- and marketing decisions were mainly taken on a product basis. Many subsidiaries were also given status as product-specialists and in a few cases also as "strategically independent" with extensive product- and marketing responsibilities, backed up with R&D facilities. The major difference between the strategies during this fourth phase and those earlier, was a substantial decrease in the autonomy of the subsidiaries, as they became an important part of an international strategy, promoted by their parent-corporations.

This stage-model, where subsidiaries can develop, ideally from marketing satellites to "strategically independents", are of course only based on historical evidence, determining only partly the present activities of TNCs and their subsidiaries. The historical situation of Europe in the 1980s indicates, on the contrary, that many TNC subsidiaries follow different routes than many of the American subsidiaries during the Post-War era. During the 1980s many American TNCs lost much of their earlier dominance in Europe, mainly to Japanese and German TNCs. Japanese manufacturing activities on the European market are in principle concentrated to import-substituting, with none or only marginal production for a global market. Empirical indications have also found that internationally integrated networks of Japanese electronic TNCs are only to a insignificant degree emerging, given the strength of factors favouring the centralization of production (Dunning 1986).

Although a growing number of foreign-located affiliates in Western Europe seem to have operated with various strategical roles during the pre-war period, empirical findings suggest that most affiliates were still non-integrated in the early 1980s. During that time, most affiliates seem to have operated relatively independently from the parent-corporations, with a country- or regional centred strategy, often as miniature replicas (Hood and Young 1983). However, later empirical studies suggest that TNC-integration has grown during the 1980s. In a study of 129 foreign-owned TNCs operating in Scotland in the late 1980s (Young, Hood and Dunlop 1988) much stronger empirical indications were found on varied strategical responsibilities in different types of subsidiaries, characterized by a range of performance in terms of market-size, product-lines, foreign trade, R&D, and degree of economic integration into the local economy. The evidence collected, so far, on the proportion of TNC subsidiaries in Britain within different categories suggests that miniature replicas and rationalized manufacturers are predominant. However, miniature replicas in Britain have been subject to much more diversity than in Canada. For one group, miniature replica status is simply an early life-cycle stage for the firm, and, for other miniature replica groups, strategy is less likely to be as country-centred as in Canada, because of the adjacency of the market in continental Europe. Different types of rationalized manufacturers are also in evidence, depending on the focus of integration (Europe, hemispheric, global), market growth and corporate success. According to these studies, manufacturing and marketing for Europe, in Europe, seems from the available evidence to be a fairly robust broad generalization, although companies are at very different stages of implementing this.

A more recent empirical study on the variations of subsidiary roles among foreign-owned TNCs in a European context is provided by Jarillo and Martinez (1990), indicating some varied strategical responsibility of manufacturing subsidiaries located in Spain in 1988. In this study, a typologization was used based on the degree of integration with other parts of the corporation and localization, i.e to what degree various functions in the value-chain were carried out by the subsidiaries, ideally resulting in three broad groups of strategy roles. The first group, identified as receptive subsidiaries, were relatively highly integrated subsidiaries, only carrying out some functions in the value-chain. This type of affiliate was typically found in global industries. The second group of subsidiaries was identified as operating with an autonomy strategy, carrying out most of the functions in the value-chain relatively independently of other parts of the corporation, and mostly found in multi-domestic industries. The third group of identified subsidiaries were a number of subsidiaries where the strategy applied was unclear, hence not possible to categorize. Highly integrated subsidiaries, given strategical mandates were not identified in this study, indicating that this type of TNC-strategy is still unusual in Spain, or that the locational advantages of putting up subsidiaries of this kind, in Spain, are weak. Finally, strong, structural forces, influencing shifting strategy roles, were found in this study, as subsidiaries in the same industry sectors tended to perform the same kind of strategy

roles. However, great variations in strategies were also found among subsidiaries in the same industries, indicating a great possibility of active strategy implementation.

9.3 International strategies among MOFAs located in Sweden

In the present study of the variation of international strategies among MOFAs located in Sweden, a relatively broad typologization is applied in order to capture some of the essential dimensions in the operations of the affiliates. Three categories of affiliates, derived in part from Poynter and White's typologization presented above, are used as a means of organizing the empirical findings in this chapter. The first category, the *Miniature Replica*, includes affiliates which can be seen as horizontally integrated, involved in host market production which are closely related to parent-corporations product lines. The key characteristic of this type of affiliate is a geographical restriction of the sales markets. The second category, the *Rationalized Manufacturer*, includes affiliates specialized in manufacturing one or a few products, aimed at international markets. The key characteristic of this type of affiliate is a specialization of the product scope. The third category, the *Strategic Independent*, includes affiliates where neither the geographical scope of markets, nor the product lines are restricted, meaning that this type of affiliate has the freedom to develop its own and unrelated product lines, aimed at those geographical markets the affiliate finds profitable.

In order to distinguish between these three categories of affiliates, the local managers have been asked to indicate which of the three categories of affiliates, defined below, is the best description of their operation in Sweden:

1) *Miniature replica*: Affiliate which produces and markets one or more of the parent-corporations' product lines, or related product lines, on the local or adjacent market.

2) *Rationalized Manufacturer*: Affiliate which is specialized to produce a limited number of products or components for many international markets. The affiliate may play the role of corporate-supplier of these products or components

3) *Strategic independent*: Affiliate which has the freedom and resources to develop its own product-lines for local, regional or international markets.

This method of categorizing the affiliates may not be very stringent, as it is open to a substantial amount of subjectivity among the respondents when categorizing their affiliate. However, this subjectivity may also be seen as an advantage as the general managers, or other chief executives responding to the questions, are normally the people best placed to interpret the main characteristics of their affiliate, e.g. by using more subtle indications than may be captured by outsiders applying statistically

stringent methods (e.g. cluster analysis) for categorizing data into groups with similar characteristics, which nevertheless may miss essential dimensions of the objects under study (Young et.al 1988). The applied method of categorizing the affiliates is by all cases seen as sufficient to give some indications as to the share of affiliates operating with different strategic roles in terms of market- and product responsibilities.

From this exercise, it was found that out of a total of 296 foreign-owned affiliates included in the study, 28 percent were identified as miniature replicas, 23 percent as rationalized manufacturers and 47 percent as strategic independents, see Table 9.1. A smaller number of firms, 2 percent, were not able to give any statements as to which of these categories best described their operations.

Table 9.1 *MOFAs located in Sweden 1993, by type of international strategy.*

International strategy	Percent	N
Miniature replica	28	84
Rationalized manufacturer	23	69
Strategic independent	47	138
No data	2	5
TOTAL	100	296

Source: Survey data by the author

Below, the extent of integrated international production will be compared between the three categories of affiliates. As was discussed above in section 9.2, generally, miniature replicas can be suspected to be integrated into parent-corporations operations to a large extent. This type of affiliate is suggested to be dependent on parent-firms technological competence, and is often claimed to import a substantial proportion of purchased inputs from parent- and sister-firms. At the same time, while this type of affiliate is basically intended to manufacture for the local market, intra-firm sales may be marginal, and the affiliate may also operate quite independently from parent- and sister-firms in most other parts of the value chain, except where this is related to generating technological competence and purchasing of material inputs.

Rationalized manufacturers, may also be integrated into parent-corporations, especially if they are vertically integrated, e.g. where the production process is based on imported materials, parts or components from parent- or sister-firms, alternatively, if the affiliates themselves produce material inputs which are aimed at further processing by parent- and sister-firms abroad. At the same time if this type of affiliate produces finished products which are not related to parent- or sister-firms production, but is aimed at external customers, a substantial degree of exports may still be exported through parent-company's sales organisation. This implies, also, that marketing, sales and distributions may be coordinated with parent- and sister-firms abroad. Furthermore, this type of affiliate may import complementary products from parent- and sister-firms in order to provide customers with a broader product line compared to

what the affiliates produce themselves. The technological competence of this type of affiliate seem likely to vary, depending on whether the affiliate is vertically integrated or not. If the production is vertically integrated, the product as well as the process technology is most likely adapted to other parts of the parent-corporation. If, on the other hand, the affiliates are not vertically integrated, their product, and process technology may be based on competence generated indigenously by the affiliate.

Finally, the strategic independent firms is suspected to be least integrated with parent- and sister-firms. Basically the relationship to parent-corporation is often suggested to be restricted to administration- and financial relations. Since this type of affiliate has the freedom to develop unrelated products, the dependency on parent- and sister-firms' technological competence is likely to be low. Also, intra-firm trade in intermediate inputs is likely to be relatively low. However, if this type of affiliate is export-oriented, the share of exports can be distributed through intra-firm exports.

9.4 Exports and local sales

Turning now to the findings on local sales and exports. Firstly, it can be found that miniature replicas, to a large part operate as marketing channels for the resale of products made by parent- and sister-firms. Among these affiliates over two thirds (65%) indicate that they sell products on behalf of parent- and sister-firms, accounting for around one fifth of total sales. Among rationalized manufacturers and strategic independent affiliates, a smaller share (40 and 45% respectively), seem to be involved in resale activities accounting only for 10 percent, respectively, of their total sales.

One of the most important dimensions distinguishing these three types of affiliates is the extent in which the manufactured output is sold on the local market or exported to different world markets. As can be seen in Table 9.2, miniature replicas are basically focused on the local Swedish and the nearby Nordic markets. By contrast, rationalized manufacturers are highly export intensive, with over one third of manufactured sales going to Western Europe and another 20 percent to non-European markets, especially Japan/SE Asia and North America. Strategic independent affiliates, finally, are exporting little more than half of their manufactured

Table 9.2 *Percent manufactured sales in different markets, by MOFAs located in Sweden 1993, by type of international strategy.*

International strategy	Sweden	Nordic excl Swe	Western Europe	Russia/ East Europe	North America	Latin America	Japan/ SE Asia	Rest of world	Total	N
Miniature replica	76	15	7	1	1	0	0	0	100	84
Rationalized manufacturer	31	11	36	1	7	1	10	3	100	69
Strategic independent	46	10	27	1	7	1	5	3	100	138
No data										5
TOTAL	47	11	25	1	6	1	6	2	100	296

Source: Survey data by the author

output, mainly to Western Europe, while non-European sales account for 17 percent of manufactured sales.

The tendency for miniature replicas to be focused on the host market, while rationalized manufacturers are mainly involved in exports, is also supported by Table 9.3, which show that around one fifth of miniature replicas are exclusively focused on the domestic market, while only 10 percent export most of their output. By comparison, the proportion of rationalized manufacturers which are not engaged in exports is only 4 percent, while as many as two thirds export most of their output.

Table 9.3 *Percent exports of manufactured sales by MOFAs located in Sweden 1993, by type of international strategy.*

International strategy	0%	1-10%	11-25%	26-50%	51-75%	76-100%	Total	N
Miniature Replica	21	20	27	20	8	2	100	84
Rationalized Manufacturer	4	7	9	16	26	38	100	69
Strategic Independent	5	16	17	19	16	28	100	138
No data								5
TOTAL	10	15	18	18	16	23	100	296

Source: Survey data by the author

9.5 Intra-firm sales

We can also identify variations in the extent by which the different types of MOFAs internalize their manufactured sales, see Table 9.4. Most engaged in intra-firm sales, as well as intra-firm exports, are affiliates which operate as rationalized manufacturers. In this category, more than 40 percent of total sales are internalized, corresponding to almost 60 percent of all exports. Among strategic independent affiliates the degree of internalization of sales-markets is substantially lower, or 21 percent and 35 percent

Table 9.4 *Percent intra-firm exports of manufactured sales, and, percent intra-firm exports of manufactured exports, by MOFAs located in Sweden 1993 by type of international strategy.*

International strategy	Percent intra-firm exports of manufactured sales			Percent intra-firm exports of manufactured exports	N
	Finished goods	Material inputs	Total		
Miniature Replica	9	1	9	38	84
Rationalized Manufacturer	38	3	41	58	69
Strategic Independent	20	1	21	35	138
TOTAL	23	1	25	44	296

Source: Survey data by the author

respectively, of total sales and total exports. Among miniature replicas, almost 40 percent of manufactured exports are exported on an intra-firm basis. Since this type of affiliate is mainly focused on the domestic market, total sales that are internalized amount to only 9 percent. In the same table we see that all categories of firms show only marginal exports of material inputs; although rationalized manufacturers, to a somewhat larger extent, produce material inputs for usage by other parts of their parent-corporations. Instead, intra-firm export consist almost only of finished products aimed at external customers.

The tendency for rationalized manufacturers to be mostly engaged in intra-firm exports is also found in Table 9.5, which shows that 80 percent of all rationalized manufacturers, are involved in intra-firm exports, and that around 45 percent export most of their manufactured output internally. Corresponding figures for the two other types of affiliates are lower.

Table 9.5 *Percent intra-firm exports of manufactured exports by MOFAs located in Sweden 1993, by type of international strategy. Only affiliates with exports.*

International strategy	0%	1-10%	11-25%	26-50%	51-75%	76-100%	Total	N
Miniature Replica	40	3	8	8	15	26	100	66
Rationalized Manufacturer	20	5	14	17	24	20	100	66
Strategic Independent	32	10	9	24	11	14	100	131
TOTAL	32	7	10	18	15	19	100	266

Source: Survey data by the author

9.6 Imports and domestic purchasing of material inputs

In terms of imports, MOFAs operating as rationalized manufacturers seem, on the whole, to import a substantially larger amount of material inputs compared to miniature replicas and strategic independent affiliates, see Table 9.6. While the former group of affiliates import almost two thirds of all material inputs, the latter groups purchase half of their material inputs from suppliers located in Sweden.

Table 9.6 *Percent purchases of material inputs in different markets by MOFAs located in Sweden 1993, by type of international strategy.*

International strategy	Sweden	Nordic excl. Swe	Western Europe	Russia/ East Eur.	North America	Latin America	Japan/ SE Asia	Rest of World	Total	N
Miniature Replica	50	8	35	0	1	2	3	1	100	84
Rationalized Manufacturer	37	12	37	3	3	1	3	3	100	69
Strategic Independent	50	15	29	1	4	0	1	1	100	138
TOTAL	45	13	33	2	3	1	2	2	100	296

Source: Survey data by the author

9.7 Intra-firm purchasing

When comparing the degree of intra-firm purchasing of material inputs between MOFAs operating with different international strategies (see Table 9.7), in total, rationalized manufacturers seem to be relatively most engaged in intra-firm purchases; intra-firm deliveries responsible for over one fifth of all purchases of inputs. Strategic independent affiliates, on the other hand, seem to have internalized their total procurement of inputs least.

Table 9.7 *Percent intra-firm purchases of total purchases of material inputs, and, percent intra-firm imports of total imports of material inputs, by MOFAs located in Sweden 1993, by type of international strategy.*

International strategy	Total intra-firm purchases of total purchases of material inputs	Percent intra-firm imports of total imports of material inputs	N
Miniature Replica	17	28	84
Rationalized Manufacturer	22	32	69
Strategic Independent	14	25	138
TOTAL	18	29	296

Source: Survey data by the author

Furthermore, as can be seen in Table 9.8, the proportion of affiliates that internalize at least some material imports is lowest among rationalized manufacturers. While one third of rationalized manufacturers internalize at least some of their material imports, the corresponding share for miniature replicas is two thirds and among strategic independent affiliates around 40 percent. Looking only at those affiliates which internalize most of their imports, this is also highest among miniature replicas and lowest among rationalized manufacturers.

Table 9.8 *Percent intra-firm imports of total imports of material inputs 1993, by MOFAs located in Sweden, by different types of international strategies. Percent of firms.*

International strategy	0%	1-10%	11-25%	26-50%	51-75%	76-100%	Total	N
Miniature Replica	36	10	12	11	11	20	100	84
Rationalized Manufacturer	62	7	6	9	9	7	100	69
Strategic Independent	58	5	7	12	11	7	100	138
TOTAL	52	7	8	11	11	11	100	296

Source: Survey data by the author

9.8 Intra-corporate coordination of different functional activities

The degree by which the miniature replicas, rationalized manufacturers and strategic independent coordinate their different value-adding activities is illustrated in Table 9.9. Analysing variations in the degree of coordination, as well as which value adding activities are being coordinated, seems to suggest that affiliates operating as miniature replicas, to a larger extent, coordinate their up-stream activities, e.g. R&D, procurement and production. In almost 90 percent of the miniature replicas coordination in R&D are indicated, while some 40 percent claim procurements, and 30 percent claim production as being coordinated. Among the rationalized manufacturers, marketing, sales and distribution are the activities that are most coordinated with parent- and sister-firms abroad. The only area where the strategic independent firms indicate that coordination is as frequently found as compared to the other types of affiliates is in finance, where around two thirds of strategic independent affiliates coordinate their activities. In R&D and marketing around half and one third of these affiliates indicate some level of coordination. In all other areas, 25 percent or less of the strategic independent affiliates claim that any coordination with corporate firms is being organized.

Table 9.9 *Percent of affiliates where intra-corporate coordination occurs in MOFAs located in Sweden 1993, by type of international strategy.*

Coordinated activity:	Miniature Replica N=84	Rationalized Manufacturer N=69	Strategic Independent N=138
R&D	88	57	46
Procurement	43	32	25
Input quality control	19	4	6
Production	32	10	9
Output quality control	15	1	4
Marketing	36	71	34
Sales	14	51	25
Distribution	10	29	13
After-sale services	10	32	13
Finance	65	68	67
Administration	33	31	25
No coordinated activity	2	10	10

Source: Survey data by the author

Affiliates operating as miniature replicas seem mainly to receive resources from parent-corporation in up-stream, value-adding activities, apparently in the field of product technology, cited by around two thirds of these firms as being most important, see Table 9.10. Affiliates operating as rationalized manufacturers, seem, on the other hand, to be most dependent on resources related to parent-corporations' international marketing organization, cited by almost two third of these firms as most important, and to a lesser degree in the field of product technology. The strategic independent

Table 9.10 *Intra-corporate received resources cited as being among the three most important by MOFAs located in Sweden 1993, by type of international strategy. Percent.*

International strategy	Product technology	Process technology	Other type of know-how	International marketing organization	International procurement organization	Corporate goodwill	Scale-economies	Finance	N
Miniature Replica	65	37	38	36	30	32	18	38	84
Rationalized Manuf..	45	20	35	71	20	22	28	58	69
Strategic Independent	35	21	34	38	18	41	18	70	138
Total	47	25	36	45	22	33	21	57	296

Note: Total number of most important sources cited may not sum up to total number of firms, because some firms cited more, or, less, than three sources as most important.

Source: Survey data by the author

affiliates seem to be least functionally integrated with other parts of the parent-corporations, as most important corporate resources among these firms are to be found in the area of finance. Access to parent-corporations' international marketing organization and corporate goodwill are also estimated as being important by a good many of the strategic independent affiliates. As corporate goodwill can be seen as a form of marketing resource, it can be interpreted that corporate resources relating to upstream activities, such as sales and marketing are also important for these affiliates.

9.9 Inter-firm and intra-corporate technological cooperation

One of the most strategically important factors for promoting competitive advantages is often related to the capability for generating expertise in the field of product and/or process technology. Affiliates operating as miniature replicas, are often seen as dependent on the parent-corporation in terms of product- and process technology, while strategic independent firms are often seen as being more capable of developing their own product- and production technology. Rationalized manufacturers' dependence on their parent-corporation in terms of technological competence is more difficult to generalize on, mostly because this will depend to a significant extent on the degree of vertical integration with the parent-corporations. If these affiliates are producing material inputs for further usage by corporate affiliates, hence, performing a special production stage, the product technology will most likely be based on parent-corporation knowledge. The process technology used when producing the intermediate products, may very well be indigenously developed by the affiliate, however. If the rationalized manufacturer, on the other hand, is responsible for a special product or product line, extending the corporations' total range of related products, the affiliate may in this situation be able to internally generate their own technological expertise. In fact, the ability to generate competitive products in a

certain segment of a broader category of products may be the main reason why the affiliate was incorporated by the parent-corporation in the first place.

In Table 9.11 we find that miniature replicas seem to be the most engaged in organized technological cooperation with parent firms abroad. While 90 percent of miniature replicas indicate that they have at least some organized technological cooperation with other corporate firms abroad, and around half claim this as being organized to a large or very large extent, corresponding figures, especially for strategic independent affiliates, are substantially lower. Instead this category seems to be relatively more engaged in extensive technological cooperation with external firms, especially those located in Sweden.

Table 9.11 *Percent of MOFAs located in Sweden 1993 indicating organized technological cooperation with other corporate firms, external firms (suppliers/customers) and R&D institutions. Percent of affiliates with different international strategies.*

International strategy	Corporate firms in Sweden	Corporate firms abroad	External firms in Sweden	External firms abroad	R&D institutions in Sweden	R&D institutions abroad
MOFAs indicating at least some technological cooperation						
Miniature Replica	25	90	73	48	35	12
Rationalized Manufacturer	28	83	64	59	55	12
Strategic Independent	32	74	83	66	49	27
MOFAs indicating "a large" or "very large" extent of technological cooperation						
Miniature Replica	12	48	15	3	1	1
Rationalized Manufacturer	13	35	15	9	3	0
Strategic Independent	10	38	23	13	6	3

Source: Survey data by the author

Some indications of the relative importance of various sources for generating technological competencies among the three categories of firms are presented in Table 9.12. A substantial proportion (40%) of the miniature replica affiliates claim that the most important source of technological competence is found among corporate firms abroad. The rationalized manufacturers seems to be more self-sufficient in terms of technological competence, as around 70 percent claim that this is mainly generated internally, while 13 percent of these firms indicate that corporate firms abroad are the main sources of technological competence.

The strategic independent affiliates seem to be most self-sufficient in terms of generating technological competence, as over 80 percent claim that this is mainly generated internally. The strategic independent affiliates are also least integrated with parent-corporations, with only 7 percent indicating that corporate firms, mainly abroad, are the most important generators of technological competence. In general, very few affiliates indicate that external firms or R&D institutions are most important

Table 9.12 *Sources of technological competence cited as most important in MOFAs located in Sweden 1993. Percent by type of international strategy.*

International strategy	Internally generated competence	Corporate firms in Sweden	Corporate firms abroad	External firms in Sweden	External firms abroad	R&D institutions in Sweden	R&D institutions abroad	N
Miniature Replica	58	1	40	5	0	0	0	84
Rationalized Manufacturer	72	4	13	4	6	1	0	69
Strategic Independent	83	1	7	7	0	1	1	138
No data								5
TOTAL	72	2	18	5	1	1	1	296

Note: Total number of most important sources cited may not sum up to total number of firms, because some firms cited more than one source as most important, or, that no most important source was cited

Source: Survey data by the author

when generating technological competence. The highest shares of affiliates claiming external firms in Sweden as most important, are found in strategic independent affiliates (7%), while external firms abroad are cited by 6 percent of the rationalized manufacturers, as being the most important source for generating technological competencies.

Finally, the tendency of miniature replicas to be relatively most dependent on their parent-corporations' technological competence is also indicated in Table 9.13. In this table, it can be seen that as many as 80 percent of miniature replicas indicate that cooperation with corporate firms abroad is more important than cooperation with

Table 9.13 *The relative importance of cooperation with external firms compared to corporate firms as a source for generating technology competence, in MOFAs located in Sweden 1993. Percent of affiliates by type of international strategy.*

International strategy	Cooperation with external firms in Sweden more important	Cooperation with external firms abroad more important	Cooperation with corporate firms in Sweden more important	Cooperation with corporate firms abroad more important	N
Miniature Replica	13	2	3	80	84
Rationalized Manufacturer	24	10	13	46	69
Strategic independent	36	8	7	42	138
No data					5
Total	27	6	7	54	296

Note: The balance is accounted for affiliates which indicated that external firms and corporate firms is equally important as technology generating sources. External firms: suppliers, customers, R&D institutions.

Source: Survey data by the author

external firms located in Sweden or abroad, as a source for generating technological competence. Again, affiliates operating as strategic independents tend to be least dependent on cooperation with other parts of parent-corporation for generating technological competencies. Instead, more than one third of strategic independent affiliates claim cooperation with external firms in Sweden as being more important, than cooperation with corporate firms for generating technological competencies.

9.10 Indications of competence centres

One quarter, respectively, of affiliates identified as rationalized manufacturers and strategic independents, are operating with corporate responsibilities, compared to less than 20 percent of affiliates identified as miniature replicas, see Table 9.14.

Table 9.14 *Percent of affiliates with corporate responsibilities in MOFAs located in Sweden 1993, by type of international strategy.*

International strategy	Affiliates with corporate responsibilities	Affiliates with no corporate responsibilities	N
Miniature Replica	19	81	84
Rationalized Manufacturer	25	75	69
Strategic independent	25	75	138
No data			5
TOTAL	23	77	296

Source: Survey data by the author

9.11 Summary

In this chapter, we have analysed variations in integrated international production between affiliates operating with different international strategies. The main findings are summarized in Table 9.15. The analysis showed, firstly, that, among MOFAs located in Sweden in 1993, it is possible to identify affiliates operating with various international strategies, in terms of market and product responsibilities. The findings show that strategic independent affiliates seem to be most common, comprising almost half of all affiliates, while, miniature replicas represent almost 30 percent and rationalized manufacturers almost 25 percent. The analysis shows that, generally, miniature replicas are most involved in host market production, and are relatively more integrated with parent and sister-firms, than the other groups of affiliates. Compared to the other types of affiliates, miniature replicas are relatively more engaged in resale activities, at the same time as they mainly produce for the local and the adjacent Nordic market. In terms of intra-firm exports among miniature replicas, as well as

Table 9.15 *Characteristics of MOFAs located in Sweden 1993, by type of international strategy.*

	Miniature Replica (N= 84)	Rationalized Manufacturer (N= 69)	Strategic Independent (N= 138)
Resale intensity (a)	21%	10%	10%
Affiliates with resale of corporate products	65%	40%	45%
Export intensity (b)	24%	69%	54%
Geographical scope of exports (c)	Nordic 63% WE 29% ROW 8%	Nordic 16% WE 52% ROW 32%	Nordic 19% WE 50% ROW 31%
Exporting affiliates	79%	96%	95
Export intensive affiliates (d)	10%	64%	44%
Intra-firm exports (e)	38%	58%	35%
Exporting affiliates with intra-firm exports	60%	80%	68%
Import intensity (f)	50%	58%	35%
Intra-firm imports (g)	28%	32%	25%
Affiliates with intra-firm imports	64%	38%	42%
Intra-corporate coordination	Most coordinated. Mainly R&D, finance but also procurement	Mainly marketing, finance and R&D	Least coordinated Mainly finance and R&D
Intra-corporate resource flows	Mainly product technology	Marketing. Also finance and product technology	Mainly finance
Sources cited as most important for generating technological competence	58% Internal capacity 40% Corp. firms abroad	72% Internal capacity 13% Corp. firms abroad	83% Internal capacity 7% Corp. firms abroad
MOFAs with extensive intra-corporate technological cooperation	48%	35%	38%
MOFAs with extensive inter-firm technological cooperation	15%, mainly in Sweden	15%, mainly in Sweden	23%, mainly in Sweden
MOFAs claiming external- or corporate firms as more important for generating technological competence	80% Corporate firms, 13% External firms in Sweden	46% Corporate firms, 24% External firms in Sweden	42% Corporate firms 36% External firms in Sweden
Affiliates operating as competence centres	19%	25%	25%

Note: For definitions of a-g, see Table 6.1

Source: Survey data by the author

among the other categories of affiliates, these consist almost exclusively of finished products, aimed at external customers, while intra-firm exports of material inputs for further processing by corporate firms are marginal. Among miniature replicas, intra-firm exports are lowest, as is the share of affiliates engaged in intra-firm exports. At the same time, miniature replicas are found to import a larger share of material inputs compared to strategic independent, but less than rationalized manufacturers. It is also interesting to notice that miniature replicas are less involved in intra-firm imports, compared to rationalized manufacturers. Among miniature replicas, a larger share seem to coordinate different parts of their value-chains with parent and sister-firms compared to the other types of affiliates. This is especially true for their up-stream operations, such as R&D procurement and production, together with the finance functions. The findings also show that miniature replicas seem to be relatively more dependent on parent- and sister-firms in terms of technological competence, than rationalized manufacturers and strategic independent affiliates. This is partly indicated by the fact that among miniature replicas, product technology is suggested to be the most important resource provided by parent and sister-firms. A larger share of these affiliates claim also corporate firms abroad as being the most important source for generating their technological competence, at the same time as the smallest share claim that their technological capacity is generated internally by themselves. Among miniature replicas, a much larger share also claim that parent and sister-firms are the most important partners for generating technological competence, while suppliers and customers in Sweden are claimed to be relatively least important compared to the other types of affiliates. Finally a somewhat smaller share of miniature replicas also seem to operate as competence centres on behalf of parent- and sister-firms abroad.

Rationalized manufacturers are found to be most export-oriented. Their exports are also least directed to the Nordic market, compared to the other categories of MOFAs. Among rationalized manufacturers, a higher share compared to the other categories are involved in export activities, as well as identified as export-intensive, exporting most of their manufactured output. In this category, the share of exports that is intra-firm is also the highest, and a proportionally larger share are also involved in intra-firm exports. Interestingly enough, these affiliates are also found to be most import intensive, which, in part, can be explained by the fact that they are also most involved in intra-firm imports compared to miniature replicas and strategic independent affiliates. These firms are, however, found to be only marginally involved in resale of corporate products. Overall, rationalized manufacturers seem to coordinate their value-chain to a somewhat lesser degree compared to miniature replicas, but somewhat more than strategic independents. This is especially true for their down-stream operations such as sales, marketing and after-sales services. Among these affiliates, marketing resources are also suggested to be the most important resource received from parent and sister-firms. Compared to miniature replicas, rationalized manufacturers seem to be less dependent and less involved in cooperation with parent and sister-firms when generating technological competence. Finally,

rationalized manufacturers seem to operate with corporate responsibilities to a larger extent than miniature replicas.

The strategic independent affiliates seem to be least integrated into parent- and-sister-firms' operations. Although they are, on average, less export-orientated than rationalized affiliates, a substantially larger proportion of manufactured sales are exported compared to miniature replicas. In terms of the geographical scope of export-markets, they are similar to rationalized manufacturers. An almost equally large share of strategic independent affiliates, compared to rationalized manufacturers, are engaged in exports, although a smaller share can be identified as export-extensive. Intra-firm exports are lowest among this type of affiliate, indicating that they, to a large extent, control their own sales organization abroad. In total, these affiliates import least material inputs, at the same time as they are also least involved in intra-firm imports of material inputs. The resale intensity is also low. Overall, a smaller proportion of strategic independent affiliates seem to coordinate their value-chains with parent and sister-firms. Only the finance-function seems to be coordinated by these affiliates to the same extent as the other categories. Financial resources are indicated as being the most important resource provided by parent and sister-firms. In terms of technology, strategic independent affiliates seem to be relatively least dependent on parent and sister-firms, and most self-sufficient. At the same time, a proportionally larger share of these affiliates claim that they are involved in extensive cooperation with suppliers and customers located in Sweden, and that cooperation with external firms is also a relatively more important source when generating technological competence than parent and sister-firms. Finally, strategic independent affiliates seem to operate as competence centres to the same extent as rationalized manufacturers.

Compared to other studies on variations in international strategies among foreign affiliates, a number of interesting findings of the present study emerge. First, compared to foreign affiliates located in Britain in the late 1980s (reviewed in section 9.3), MOFAs in Sweden seem to operate as strategic independents to a larger extent, since the most common types of foreign affiliates in Britain seem to be miniature replicas and rationalized manufacturers. The reason for these differences can, at least partly, be explained by the fact that most foreign affiliates in Sweden in 1993 have been acquired, in many cases relatively recently. In Britain, a much larger share of foreign affiliates were probably established as green-field investments, and, in addition, are generally older, than foreign affiliates in Sweden. Since the operations of green-field, and older affiliates, are probably easier to integrate and design to fit into parent-corporations' international strategies, than those of newly acquired affiliates, this may result in MOFAs in Sweden operating to a larger extent as strategic independent affiliates which are managed relatively independently from the international strategies of parent firms.

Secondly, the findings of the present study also suggest that, among foreign affiliates located in Sweden, the share operating as rationalized manufacturers seems to have increased during the last decades. As was discussed in section 3.12, above,

earlier findings suggest that only very few of the foreign affiliates which were exporting from Sweden in the 1960s, could be characterized as functionally specialized production units, belonging to TNCs with integrated cross-border transfers of commodities. As is shown in the present study, one quarter of MOFAs located in Sweden in 1993, seem to operate as rationalized manufacturers, specialized to manufacture one or only a few products which, in large, are aimed at the international market. This indicates that an increasing share of foreign affiliates in Sweden operate as specialized units, where the host-country is used as a production-base for exports to the international market.

Thirdly, as has also been shown for Swedish and US TNCs, trade patterns among affiliates seem to be dependent on the type of international strategies applied by TNCs when operating in different markets, where the highest propensities among affiliates to engage in exports, as well as intra-firm exports, are found in TNCs that operate strategies of cross-border product or process specialization (see section 4.4.1, above). This is also confirmed in the present study, where it was found that rationalized manufacturers, which are specialized in producing a limited number of products, were more export-intensive and more involved in intra-firm exports, compared to the other affiliates. Furthermore, as was discussed in section 4.4.2, recent studies suggest that not all of intra-firm trade takes the form of vertical integration, where different units are supplied by intermediate input goods. Instead, a more complicated picture seems to emerge, where it is necessary to distinguish between intermediate inputs and finished products since these are partly internalized for different reasons. It is suggested that intra-firm trade of intermediate products for usage in the production process should be associated with vertical integration based on economies of scale and specialization at the plant level and the exploitation of country differences in factor endowments. Intra-firm trade of finished products, on the other hand, should be more associated with horizontally integrated TNCs, operating a number of foreign-located affiliates, producing similar products in different countries in combination with imports of complementary finished products from sister- and parent-affiliates. Thus, vertical integration is suggested as being associated with intra-firm trade in intermediate inputs, while horizontal expansion enhances imports of complementary, finished goods, but tends to lead to less trade on the whole. The findings of this chapter seem, only partly, to support this perspective, but rather suggest that the distinction between horizontally and vertically integrated affiliates, in reality, is difficult to make, since many affiliates seem to be characterized by a combination of these two types of integration strategies. For example, we have identified above the existence of affiliates operating as miniature replicas, whose main objectives are to produce and market products which are related to parent-corporations' product lines, on the local or adjacent market, and are thus seen as being horizontally integrated. The empirical findings of trade patterns of miniature replicas support the view that horizontally integrated affiliates are involved in the proportionally largest shares of imports of finished products. At the same time,

however, it can also be seen that, among these affiliates, a substantial share of purchased inputs were supplied through intra-firm imports. This suggests that horizontally integrated affiliates tend not only to import finished products for resale, but also inputs from parent and sister-firms, which makes the distinction between horizontally and vertically integrated affiliates less distinct than theory suggests.

Furthermore, as was also shown above, the type of affiliate which can be said to be most vertically integrated, supplied to the largest extent by inputs from parent and sister-firms abroad, e.g rationalized manufacturers, are also found to be the most export-intensive and also most involved in intra-firm exports consisting almost exclusively of finished products aimed at external customers. This suggests that affiliates which are vertically integrated through imports of material inputs, are at the same time involved in intra-firm exports of finished products. This suggests that a clear-cut distinction between horizontally and vertically integrated affiliates is problematic, and that, in reality, affiliates, in various forms, tend to combine intra-firm imports and exports of inputs as well as finished products.

Moreover, the empirical findings above also show that intra-firm trade can be found among affiliates where parent firms do not seem to operate any product or market specialisation. As was also shown above, intra-firm imports of material inputs, as well as intra-firm exports of finished products, were also found among strategic independent affiliates. Although these affiliates were less involved in intra-firm imports and exports, compared to the other categories of affiliates, most of the strategic independent affiliates exported at least some products intra-firm, and around 40 percent also imported material inputs from parent- and sister-firms.

The tendency for many affiliates to be both vertically integrated through intra-firm imports of material inputs, and engaged in intra-firm exports of, predominately, finished products aimed at external customers, is also evident in Table 9.16. As can be seen, the share of MOFAs that were involved in intra-firm imports of material inputs, and, at the same time, exported to parent and sister-firms was 30 percent, while a somewhat larger share of miniature replicas and rationalized manufacturers are

Table 9.16 *MOFAs engaged in intra-firm imports of material inputs and intra-firm exports of finished products, in MOFAs located in Sweden 1993, by type of international strategy. Percent.*

International strategy	Intra-firm exports and imports	Intra-firm imports but not exports	Intra-firm exports but not imports	No intra-firm exports or imports	Total	N
Miniature Replica	32	33	15	20	100	84
Rationalized Manufacturer	32	6	43	19	100	69
Strategic independent	27	14	37	22	100	138
No data						5
TOTAL	30	18	32	20	100	296

Source: Survey data by the author

involved in both intra-firm imports and intra firm exports, compared to strategic independent affiliates. This suggests, again, that the distinction between vertically and horizontally integrated affiliates, is problematic, since a substantial share of MOFAs seem to combine intra-firm imports of material inputs, with intra-firm exports of finished products, aimed at external customers.

Another interesting finding from this Table also shows that, out of all MOFAs included in the study, 20 percent had no intra-firm imports or exports. Here the share of affiliates which were not involved in any intra-firm trade was almost the same for all types of MOFAs. Finally, it can also be seen that, among miniature replicas, a larger share import material inputs from parent- and sister-firms, without having any intra-firm exports, compared to the other categories of affiliates. Especially among rationalized manufacturers, a larger share are involved in intra-firm exports without having any intra-firm imports of material inputs.

10 MOFAs OPERATING IN DIFFERENT INDUSTRY CLUSTERS

10.1 Introduction

Today, one of the most important location-specific variables affecting the activities of TNCs can increasingly be related to the availability of resources and capabilities that investing firms believe are necessary to both upgrade and make the best use of their core competencies. These complementary resources and competencies seem more and more to consist of technological know-how, held by other firms, e.g. suppliers and customers. Seen like this, the positioning of specific industry clusters, i.e a constellation of interrelated business partners located in specific nations, or regions, can act as a prime locational pull-factor, affecting the spatial distribution of TNC investment. In order to stay competitive, most TNCs need to combine the resources and technological capabilities of their own systems with the establishment of collaborative relationships with firms outside their production system. Foreign affiliates may, therefore, wish to establish strong linkages with host country firms, especially those supplying components, materials and services, in order to generate new or adapt existing technology.

In this chapter, we focus on variations in integrated international production between MOFAs operating in different Swedish industry clusters. Since few, if any, in-depth studies on the extent to which TNCs tend to operate in nationally competitive industry clusters exist, it is difficult to hypothesize to on the extent in which this might affect the degree of international integration of production. Theoretically, on the one hand, it can be assumed that MOFAs that are related to large industry clusters, in which Sweden is especially competitive, might have extensive linkages to suppliers and customers in Sweden. At the same time, parent TNCs might also wish to integrate these affiliates with other parts of the corporation in order to exploit the capabilities and resources which are generated in the network of suppliers, customers and other related firms constituting the industry cluster.

Below, some empirical findings related to the second and third objectives of the study (set out in section 1.2), will be presented, i.e, firstly, to identify variations between MOFAs operating in different Swedish industry clusters, and, thereafter, to analyse if these variations tend to affect the extent of internationally integrated production

Thus, the aim of the present chapter is: a) *to identify the proportion of MOFAs operating in different Swedish industry clusters, and* b) *to analyse the extent in which integrated international production tends to vary between MOFAs operating in different Swedish industry clusters.*

The possible variations in integrated international production will be revealed by comparing MOFAs operating in different Swedish industry clusters, focusing on the seven research questions, set out in section 4.6, above, i.e to analyse: i) *exports and domestic sales,* ii) *intra-firm sales,* iii) *imports and domestic purchasing of*

material inputs, iv) *intra-firm purchasing of material inputs,* v) *intra-corporate coordination of functional activities,* vi) *inter-firm and intra-corporate technological cooperation,* vii) *to what extent MOFAs operate as competence centres on behalf of parent- and sister-firms.*

The present chapter is organized as follows. Section 10.2 continues with some basic and general ideas concerning the significance of industry clusters and what impact this may have on TNC activities. Section 10.3 briefly discusses the importance of different industry clusters in Sweden. Section 10.4 discusses some methodological problems related to the identification of MOFAs operating in Swedish industry clusters. Section 10.5 empirically presents the total numbers of MOFAs operating in different Swedish industry clusters, while section 10.6 gives a picture of the geographical location of MOFAs operating in different clusters. The extent to which MOFAs tend to operate in internationally competitive Swedish clusters is presented in section 10.7. Section 10.8 presents some variations in terms of integrated international production among MOFAs operating in competitive Swedish clusters, compared to other affiliates. This analysis is structured in the same way as the three previous chapters analysing variations in integrated production. In order to test the existence of any systematic difference between MOFAs operating in competitive Swedish industry clusters, compared to other MOFAs, section 10.8.1 analyses the geographical scope of sales-markets, distinguishing between products that have been manufactured by the individual affiliates in Sweden and those that are resold on behalf of parent- or sister-firms. Thereafter, section 10.8.2 discusses the extent and characteristics of integration through intra-firm sales, distinguishing between manufactured output in terms of finished products aimed at external customers, and products used as material inputs by parent- or sister-firms outside Sweden. In section 10.8.3 the extent in which material inputs are purchased from suppliers located in the host market, alternatively imported from suppliers outside Sweden is discussed, while section 10.8.4 gives an account of the extent of backward vertical integration through intra-firm purchasing of material inputs from other parts of the parent-corporation. Thereafter, the chapter continues with an examination of some possible systematic variations between the two categories of MOFAs in terms of integration of other parts of the value chain. Section 10.8.5 shows variations between MOFAs operating in competitive Swedish industry clusters, compared to other MOFAs, in terms of intra-corporate coordination of different parts of their value chains. Section 10.8.6 presents comparisons between these two groups of affiliates in terms of inter-firm and intra-corporate technological cooperation in order to develop technological competence, while section 10.8.7 focuses on the extent in which the two groups tend to operate as competence centres on behalf of corporate firms outside Sweden. Finally, section 10.9 summarises and, as far as possible, discusses the most important findings in relation to findings from other related studies.

10.2 Agglomeration economies and inward FDI: Some basic ideas

The notion of agglomeration economies, i.e. economies external to the firm, but internal to a group of interrelated firms localized in a geographical area, as a crucial aspect affecting the competitive advantages of firms, dates back at least to Marshall (1920). The basic idea of agglomeration economies is that links between firms, institutions and other economic agents, located in geographical proximity, tend to generate advantages of scale and scope, e.g. development of general labour markets and specialized skills, and enhanced linkages between suppliers and customers (Lloyd and Dicken 1990). Generally stated, agglomeration economies are supposed to give rise to the minimization of distance between firms and their trading partners and at the same time facilitate communication between customers and suppliers, in other words, to improve the competitiveness of participating agents by lowering the transaction costs of agents located in the geographical area (Scott 1988b).

Since the 1980s, especially in the field of economic geography, a number of regional studies in the US and Europe have emerged, suggesting that geographical clusters of related activities not only exists, but also substantially contribute to the competitiveness of participating agents (cf Piore and Sabel 1984; Glasmeier, 1988; Scott 1988a, 1993; Storper 1989; Saxenian, 1994, Malmberg et.al 1996).

In economic and business literature, an increasing awareness of agglomeration economies and the spatial clustering of firms as important determinants for country and firm competitiveness can also be identified (e.g. Krugman 1990; 1991; 1993; 1995, Krugman and Venables 1994, Wheeler and Moody 1992.

Despite claims that TNCs have become de-nationalized and that the importance of national, regional and local differences is of an insignificant importance, compared to global trends (Ohmae 1990, Reich 1992), in this literature it is increasingly recognized that TNCs still originate in specific places and through the influence of routine and inertia, carry with them acquired attributes. For example, cultural familiarity is still a powerful determinant of location decisions in such areas as marketing and personal management. The members of the boards of most TNCs are still controlled by the nationals of the home country and political alliances are still predominately with home country governments (Hu 1992, Streeten 1992). Moreover, rather than diminishing the importance of location to many production tasks, recent technological change, including organisational innovations, such as lean production systems, seem to have reinforced the importance of geographical differences (Krugman 1993, 1995). While FDI is often found to be concentrated in countries with above average income levels (UNCTAD-DTCI 1994), a tendency to concentrate in the wealthier locations in these countries is also observed (de Vet 1993).

The increasing awareness of the importance of agglomeration economies among scholars in economics and business administration can, partly, be attributed to the study by Porter (1990) of the competitive advantages of nations. In that study, covering a wide range of industries in which companies located in ten different

countries have generated international competitive advantages, an analytical tool is presented which consists of a set of interrelated determinants for explaining why firms of different home-countries, or regions, become internationally competitive in certain industries, while less successful in others. These determinants, visualized as a diamond of competitive advantages, consist of a reinforcing system, based on four sets of location specific attributes; i) the quality and quantity of demand for goods and services by domestic firms, ii) the quality and quantity of natural and created resources, iii) the presence or absence in the nation of supplier industries and related industries that are internationally competitive, and iv) the conditions in the nation governing how companies are created, organized and managed and the nature of domestic rivalry. In addition, government policy and the role of chance might also play a role in shaping the specific setting in which firms in certain industries tend to be internationally competitive.

Through this analytical tool, it is explained why the clustering of related groups of successful firms and industries emerge in one nation to gain a lead in world-wide markets. In this perspective, the homebase is seen as most important for TNCs capacity to innovate, and the homebase is also the place from which competitive advantages ultimately emanates and from which they are sustained. At the same time, internationally competitive companies are not seen as passive bystanders in the process of creating competitive advantages. Instead, ample examples illustrate that globally competitive companies are taking steps to make their home nation an even more favourable environment for competitive advantages. One method being to selectively tap onto advantages available in other nations, in order to expand the advantages generated at the homebase, or, alternatively, offset disadvantages found there, although too much reliance on activities in other nations is seen as threatening the sustainabillity of a firm's competitive advantages in the long run. One of the most important ways used by TNCs in order to tap onto the collective knowledge base of foreign diamonds, is to serve sophisticated and demanding customers in foreign markets through a local presence, not only through marketing and sales activities, but also through production activities. Another method of tapping foreign diamonds is to source inputs or machinery from world class suppliers abroad.

Thus, geographically localized resources and capabilities can be seen as affecting the spatial distribution of TNC activities. During the last decades, the significance of different, spatially related variables, has changed substantially in its relative importance (Dunning 1994). Generally, at least in developed countries, the importance of natural resources and unskilled labour seem to have diminished as motivating inbound FDI, while that of created assets and opportunities of networking with local firms seem to rise. Inward FDI, increasingly, seems to be pulled to countries and regions that can offer the most cost-effective complementary assets and the quality of infrastructural support that an integrated international production or marketing strategy requires. High on the list of priorities for choosing where to invest are state-of-the-art facilities for the cross-border transmission of information, technology and finance, an effective and trustworthy legal framework and the quality of a country's

educational and technological infrastructure.

Furthermore, Dunning (1995) suggests that, today, one of the most important location-specific variables affecting the activities of TNCs increasingly can be related to the availability of resources and capabilities that investing firms believe are necessary to both upgrade and make best use of their firm-specific competencies. These complementary resources and competencies increasingly seem to consist of technological know-how held by other firms, which, rather than being sourced through arms-length market transactions, can only be assimilated through bilateral relationships characterized by the continuous handshake of an alliance relationship, rather than the invisible hand of the market (Gerlach 1992). Hence, the positioning of a constellation of related partners in specific regions can act as a prime locational pull factor, affecting the spatial distribution of TNC investment. Recent empirical illustrations of the attractiveness of national or regional networks of related firms for inbound investments, can be found, for example in Italy (Lazerson 1993), Germany (Herrigel 1994), and the US (Audretsch and Feldman, 1994).

Tapping onto foreign diamonds of competitive advantages is, however, no easy task. To be able to successfully tap into national competitive clusters, firms must become a part of that culture, feel the local competitive pressure and break completely into the networks represented by the national cluster (Porter 1990). At the same time, if a foreign subsidiary becomes an insider in a national cluster, it will find it difficult to substantially influence the parents' global strategy at a distance from headquarters and the core research base. These difficulties can be illustrated by findings from surveys of international Swedish TNCs ((Zander 1994, Sölvell and Zander 1995), which suggest that the potential for tapping foreign diamonds is limited in important respects. Although some large Swedish TNCs have established "centres of excellence", i.e. major divisional headquarters and R&D activities for certain business areas, in local milieux outside Sweden, there is little evidence that Swedish TNCs transfer development capabilities internationally, or, that they share innovation responsibilities within specific product areas between home and foreign units.

From another point of view, TNCs can also be seen as creators of foreign clusters through their network of suppliers and customers located in various host markets. This phenomenon was identified in the early 1970s (Knickerbocker 1973), while the most obvious examples today are found among Japanese TNCs operating in the American and British automobile industry (Mair 1994). Rather than establishing themselves in areas consisting of industry clusters, these Japanese TNC often generate their own network of material and services suppliers.

At a conceptual level, Dunning, (1992) has extend Porters diamond model by introducing transnational business activity as a new component, directly or indirectly affecting the various facets of the diamond. Generally, inbound FDI, is here seen as a vehicle positively contributing to the upgrading of national competitiveness; basically because they are likely to provide a different package of resources and capabilities from that provided by national firms.

Furthermore, Dunning (1994), suggests that the principal criteria by which national

administrators evaluate inbound FDI can be related to its perceived contribution to the improvement of the competitiveness or the productivity of the resources and asset-creating capabilities located within their areas of jurisdiction. Here, inward FDI, basically, is seen as interacting with the existing competitive advantages of host nations, affecting their future competitive advantages in a variety of ways. Basically, the benefits to be reaped from FDI are suggested to be dependent on the type and age of the investment, the economic characteristics of the host country, and the macroeconomic and organizational strategies pursued by the host government. For example, resource seeking and market seeking investments are usually the main motives for an initial entry by a firm, while efficiency seeking and strategic asset seeking investments are often sequential in nature, performed by established TNCs. In the 1960s and 1970s, most FDI were of the first and second kind, while in the 1980s and early 1990s, FDI, increasingly, has been of the third and fourth kind. Up to 75 percent of all TNC activity between the US, Western Europe and Japan since the mid 1980s has been by established European, United States or Japanese TNCs, that from the start of their internationalization programmes have sought to coordinate the deployment of their domestic and foreign assets (ibid).

Moreover, depending on the motives for the investment, different contributions to the upgrading of competitiveness of the host country are suggested to be most likely. The contribution of each type of investment will be both activity and firm specific, while at the same time tending to vary according to the age of the investment. Generally, the local value-added of a foreign affiliate seems to be positively related to its age. Each type of FDI contributes differently to the upgrading of competitiveness of host countries, affecting the four facets of Porter's diamond of competitive advantages. For example, market and resource-seeking investments may raise the productivity of indigenous firms through the transfer of resources and capabilities and transactions with domestic firms. Efficiency seeking FDI can assist host countries to restructure their economic activities more in line with their dynamic, comparative advantages; reduce the cost of structural adjustment and foster demanding purchasing standards by firms and consumers. Strategic, asset-seeking FDI have the possibility to help integrate the competitive advantages of the acquired firms with those of the acquiring firm and increase competition between domestic firms. However, this type of FDI, unlike the other types, may be undertaken with the specific purpose of transferring the assets acquired from the host to the home country. This may weaken the competitiveness of the host country. (For reviews of negative effects of inward investments see Phelps 1992, Ashcroft and Love 1993, Malmberg 1995).

10.3 Internationally competitive Swedish industry clusters

In the case of Sweden, the industry structure is characterized by the relatively dominant position of natural-resource-related industries, in combination with a variety of related machinery and mechanical engineering industries. Compared to many other developed countries, Sweden has relatively few internationally competitive consumer industries. According to Porter (1990) and Sölvell et.al (1991), Swedish competitiveness can mainly be linked to five larger industry clusters, of which three are especially dominant.

The largest of these internationally competitive Swedish clusters, consists of firms operating in the transportation industry, including manufacturers of trucks, passenger cars, buses and aircraft, as well as manufacturers of engines and a variety of related firms producing e.g. tools, equipment and robots. The second largest cluster is related to forest products, including timber and wood products, pulp and paper products and paper-processing machinery and equipment. The third large of competitive Swedish industry cluster is the materials/metals industry, including iron and steel manufacturers, manufacturers of nonferrous materials, metal equipment, e.g. rock drills and rock drilling equipment, and electric industrial furnaces and rolling mills.

In addition to these three dominant clusters, another two, smaller, industry clusters, have generated extra-ordinary international competitiveness. The first of these smaller clusters is found among manufacturers of power generation, transmission and distribution, which all can be linked to Sweden's hydropower resources and high energy demanding pulp, paper and metal processing industries. The second of the smaller competitive Swedish clusters is related to telecommunication equipment, especially public switches, mobile telephone-, radio- and data systems and defence communication.

Finally, compared to many other industrial nations, the range of internationally competitive industries in Sweden is quite narrow. For example, about half of total Swedish exports come from competitive industries related to the materials and metals, forest and transportation clusters (Porter 1990).

10.4. Methodological problems identifying different clusters

Before presenting the findings on MOFAs operating in various Swedish industry clusters, some methodological comments about the construction of the cluster charts below is necessary, since the results will, largely, depend on the applied method. The analysis of national differences in the location of competitive industry-clusters, applied by Porter (1990) and Sölvell et al. (1991), is mainly based on official UN trade statistics, complemented by indications of significant outward FDI by domestic companies. This method of industry cluster classification has some shortcomings. Firstly, a basic problem with this method is that, even if the lowest level of aggregation in the UN trade statistics is used (SITC 5-digit level), in many situations,

this is inappropriate when deciding to which industry-cluster a certain product should be classified. Only in those situations where it is possible to identify a certain industry-cluster by looking at the categorical name of the individual product, or group of products, it is possible to use trade statistics when constructing the cluster charts. In reality, it is not always possible to know which industry cluster a certain product should be classified in.

Secondly, if the analysis of different clusters also intends to include related and supporting industries, firm level data is necessary. This is because the application of individual products, as classified in trade statistics, as well as in industry statistics, can often be found in a number of different industries. Take, for example, the case of a manufacturer of strip steel. In UN trade statistics, this normally will be included in the product category 675.01 (according to SITC rev. 2). The problem is that the customers of strip steel can be found, among others, in the transportation industry, as well as in the forest industry cluster.

Thirdly, when constructing the cluster charts another problem arises, due to the fact that a product can, at the same time, be classified in different industry-clusters, depending whether a supply or demand-side perspective is applied. Take for example, again, the case of a strip-steel manufacturer. This product can be classified, either as being part of the metal industry cluster, viewed from the supply side, or, as belonging e.g. to the transportation or forest industry-cluster, if seen from the demand side. Hence, depending on perspective used, partly different cluster charts will be produced.

Contrary to the study by Porter, the present study is exclusively based on firm level data. This makes possible a classification of individual affiliate as belonging to a specific industry cluster on the basis of the sales value of manufactured products. In the case of affiliates producing a range of diversified products, the major product line, in terms of sales value, is taken as an indication as into which industry cluster it should be classified. In 85 percent of the affiliates, the major product was responsible for more than half of total manufactured sales, while among those 15 percent of affiliates with a more diversified product-line, the major products accounted for between 20 percent and half of manufactured sales. In those situations where the major product was responsible for less than half of manufactured sales, the manager of the affiliate was asked to suggest which industry-cluster, if any, they perceived to be the most important. If no industry cluster was possible to identify, e.g. because their product was used in multiple industries, the affiliate was classified as multiple business (viewed from the demand side) or, if possible, only related to a specific raw-material cluster (seen from the supply side). By this method it has been possible to classify all MOFAs related to a specific industry cluster on the basis whether they a) manufacture products which can be classified in this specific cluster, b) manufacture inputs or machinery which are used by other firms in this specific cluster or c) manufacture products which are mainly based on inputs produced in this specific cluster.

Below, we will present a number of cluster charts which show in which industry clusters MOFAs operated in 1993. These cluster charts are based on an organizing

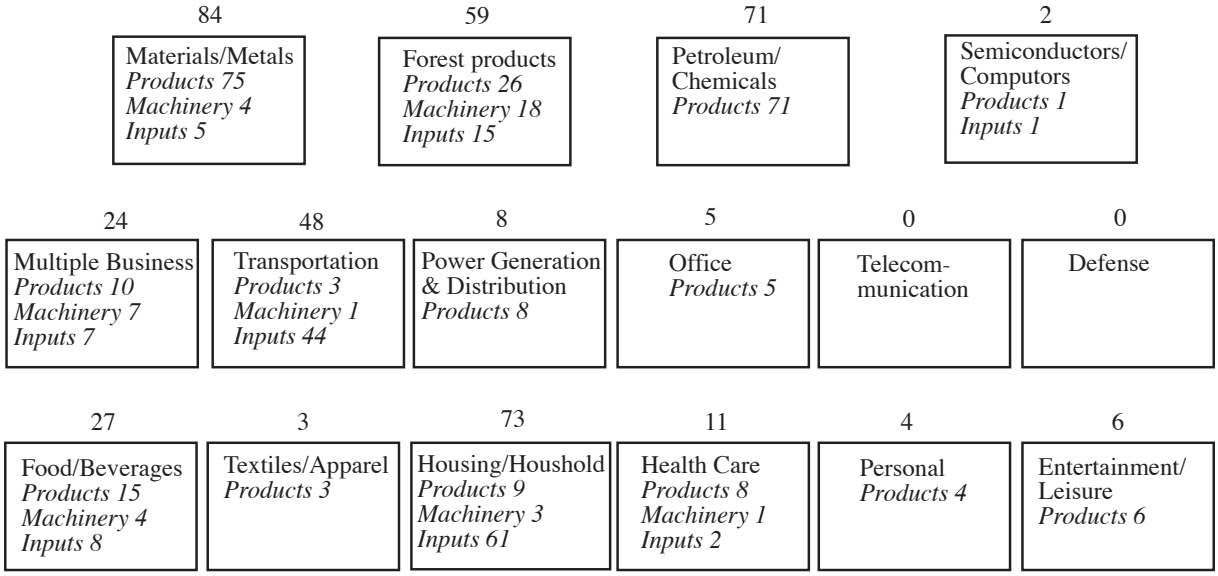
principle derived from Porter's (1990) identification of different industry clusters found in Sweden. Notice that these charts are constructed by grouping all affiliates which, on the basis of manufactured sales, can be classified as related to any of the identified clusters. For example, MOFAs producing material inputs, machinery or primary products related to the transportation industry have been classified as connected to this specific industry, irrespective of the raw material content of the products. Hence, lubricating oil, textile mats, iron castings and glass panes are all classified as products related to the transportation industry. This classification shows, in other words, MOFAs operating in different clusters from the demand side. Unfortunately, presenting the cluster chart by this method, underestimates the number of MOFAs operating in raw-material based industries, since these products are often used as material inputs in the production process of other industries. Therefore, in the raw material-based metals, forest and chemical industry clusters, a supply side perspective is applied, meaning that all products that can be related to these industries have been included, at the same time as some of these products also are classified in other industry clusters. This means that some double counting exists. For example, wood products are at the same time classified as belonging to the forest industry cluster (seen from the supply side) and the housing/household industry cluster (seen from the demand side). Around 30 affiliates are classified as at the same time, belonging to different industry clusters. Complementary tables, showing the metals, forest and chemical industry clusters from the demand side are, however, also provided.

10.5. MOFAs operating in different Swedish industry clusters

10.5.1. General survey

Figure 10.1 presents a summary of the number of MOFAs operating in different Swedish industry clusters in 1993. The organizing principle in this presentation follows Porter's (1990) classification of different industry clusters, distinguishing between MOFAs manufacturing primary products, machinery or material inputs in each specific cluster. As can be seen, five industry clusters are especially dominating in attracting many affiliates. These include the metals industry cluster (84 affiliates), housing- (73), chemicals- (71), forest- (59), and transportation (48) industry clusters. In another two clusters; multiple business and food/beverages, around 25 affiliates, respectively, can be found. In all other clusters identified, only around ten or less MOFAs are found.

The figure also show the extent in which MOFAs are engaged in producing primary products, machinery or inputs related to the different clusters. We see that, in the large metal, forest, and chemical clusters, most MOFAs produce primary products, while in the transportation and housing clusters most MOFAs produce material input.



Note: The metal, forest and chemical clusters are seen from the supply side, the other clusters are seen from the demand side, which mean that around 30 MOFAs are classified in more than one cluster.

Figure 10.1 *Number of MOFAs operating in different Swedish industry clusters 1993*

Source: Survey data by the author

Notice, also, the relatively large number of MOFAs producing various kinds of machinery related to the forest cluster. In subsequent sections, a detailed analysis of the five largest clusters, i.e. the metals, housing, forest, chemicals and transportation clusters, will be made.

10.5.2 Metal-industry cluster

The largest number of MOFAs are related to the Swedish metal industry cluster, see Figure 10.2. In total, 84 affiliates (representing 28% of all MOFAs) manufacture products which directly or indirectly can be related to the metal industry. These affiliates are basically producing goods, with a whole range of industrial applications. As can be seen, only a few of these affiliates produce input goods to the metal industry e.g. special chemicals, alloy powder and extrusion components. A smaller number also produce metal processing machinery, e.g. to copper refineries and hot rolling mills. Instead, most affiliates in this cluster produce various inputs to the transportation industry, e.g. hydraulic cylinders, injection pipes, castings and transmissions. Another large group of MOFAs manufacture products used in the housing industry, e.g. copper tubes, steel pipes, stainless fittings, stainless kitchen sinks, and sanitation pumps. Metal products with pulp and paper industry applications are manufactured by a third large group, producing e.g. strip steel, screen plates and paper and pulp-processing machinery. In addition to this, MOFAs in this cluster also produce industrial goods with applications in the food, forestry, and

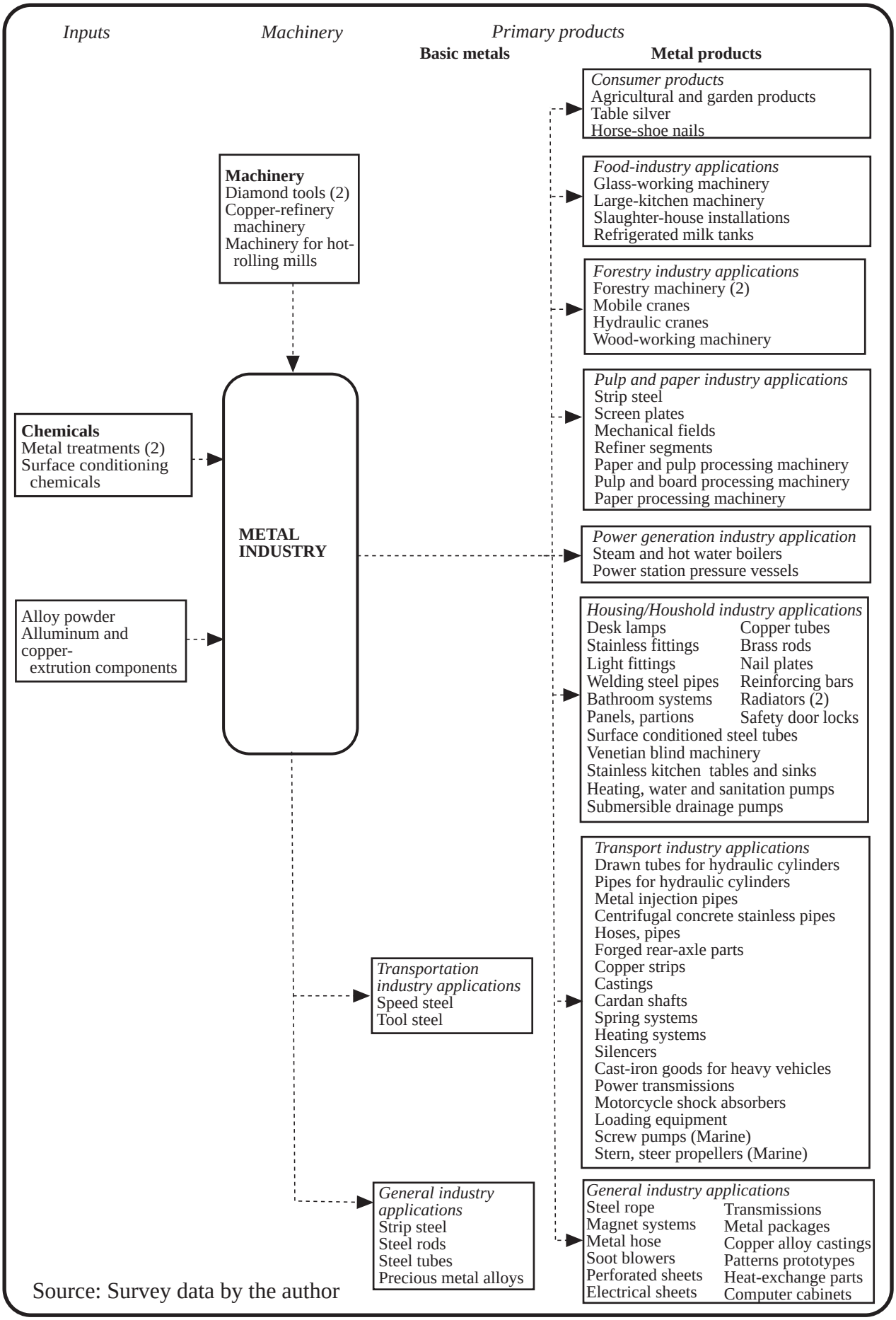


Figure 10.2 *MOFAs operating in the Swedish metal industry cluster 1993. Each product is represented by one affiliate, except where otherwise indicated.*

power-generation industries. A number of affiliates also produce goods with general industrial applications, e.g steel rope, and magnet systems.

10.5.3 Housing/Household industry

Another large group of MOFAs are related to the housing/household industry cluster. In total 73 affiliates (representing 25% of all MOFAs) can be related to this cluster, see Figure 10.3. As can be seen, most affiliates produce various inputs goods related to house-construction. Four main groups of input-goods can be identified. Firstly, a variety of metal products, e.g steel pipes, tubes, rods, nail plates radiators, and stainless kitchen sinks. Secondly a number of forest products such as wood products, laminated timber, parquetry and wall panels. Thirdly, plastic products, mainly different types of sewage tube systems and insulating materials, and, fourthly, non-metal mineral products, e.g. fibre glass, sound absorbing materials, clinkers and sanitary ware. In addition to these four groups of input-goods MOFAs producing a variety of other constructing materials can be found, including insulating materials, heating and sanitation pumps, elevators, fire doors, bathroom systems and paint.

A small number of MOFAs operating in this industry-cluster manufacture machinery, or equipment, used for house construction, e.g. submersible drainage pumps and heating and ventilation control systems.

A small number of MOFAs also produce primary products. This include household appliances, e.g refrigerators, micro-wave ovens and washing machines. Finally, affiliates producing furniture and plastic household appliances can also be found.

10.5.4 Chemical industry cluster

The third larger industry cluster where MOFAs frequently can be found, is the chemical industry, see Figure 10.4. Here, 71 affiliates (representing 24% of all MOFAs) are producing basic chemicals, such as PVC, oxo products, polystyrene, ethylene and polythelen. MOFAs are also producing a host of primary products, based on chemicals. These products, often in plastic form, are especially used as input-goods in the transportation industry and in the house constructing industry. Moreover, chemical input-goods with applications in the paper and pulp-, food-, printing-, metals-, and pharmaceutical industries are also identified.

10.5.5 Forest-industry cluster

Another large group of MOFAs can be related to the Swedish forest industry cluster, see Figure 10.5. In total 59 MOFAs (representing 20% of all MOFAs) have been

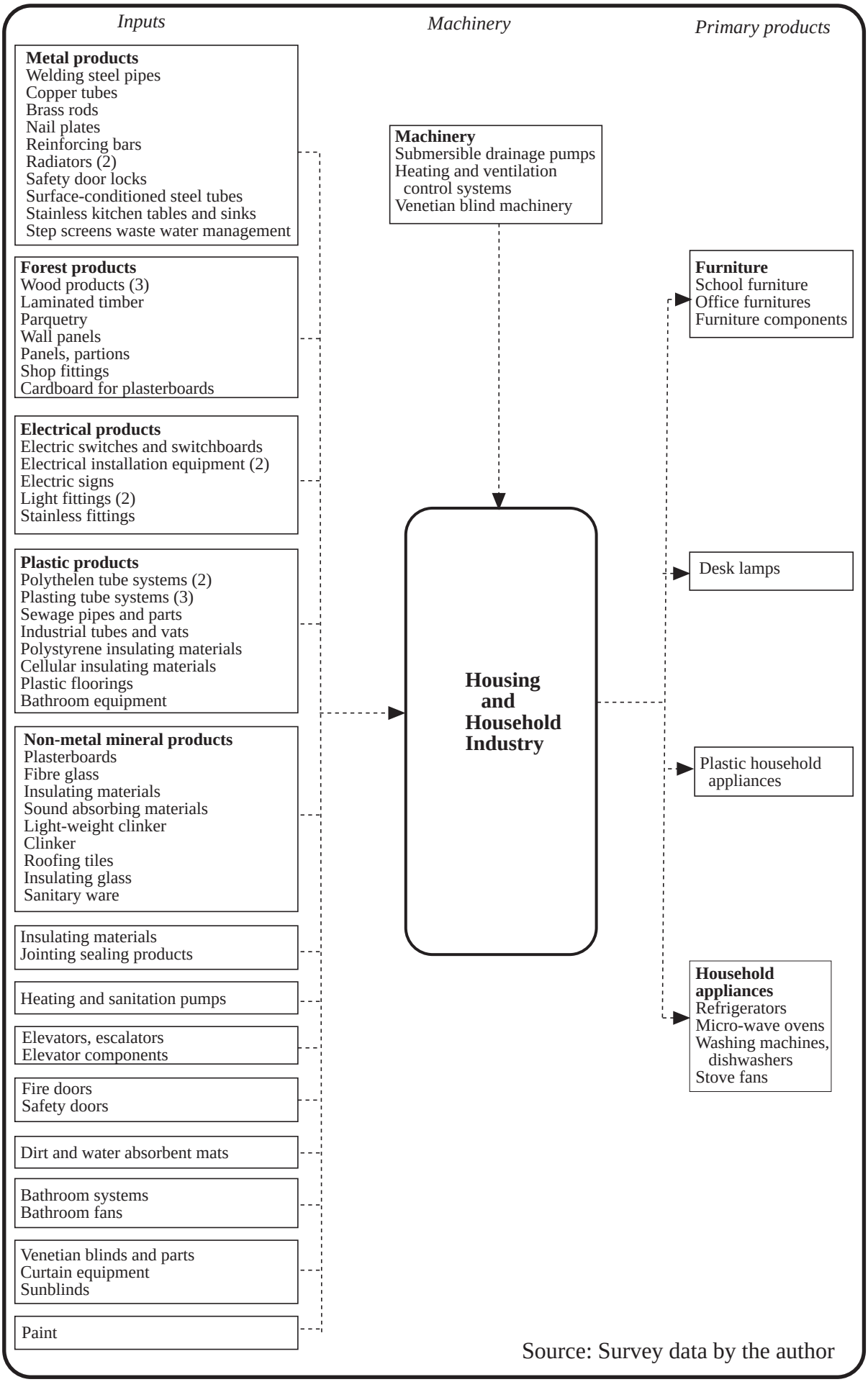


Figure 10.3 *MOFAs operating in the Swedish housing and houshold industry cluster 1993. Each product represents one affiliate, except where otherwise indicated.*

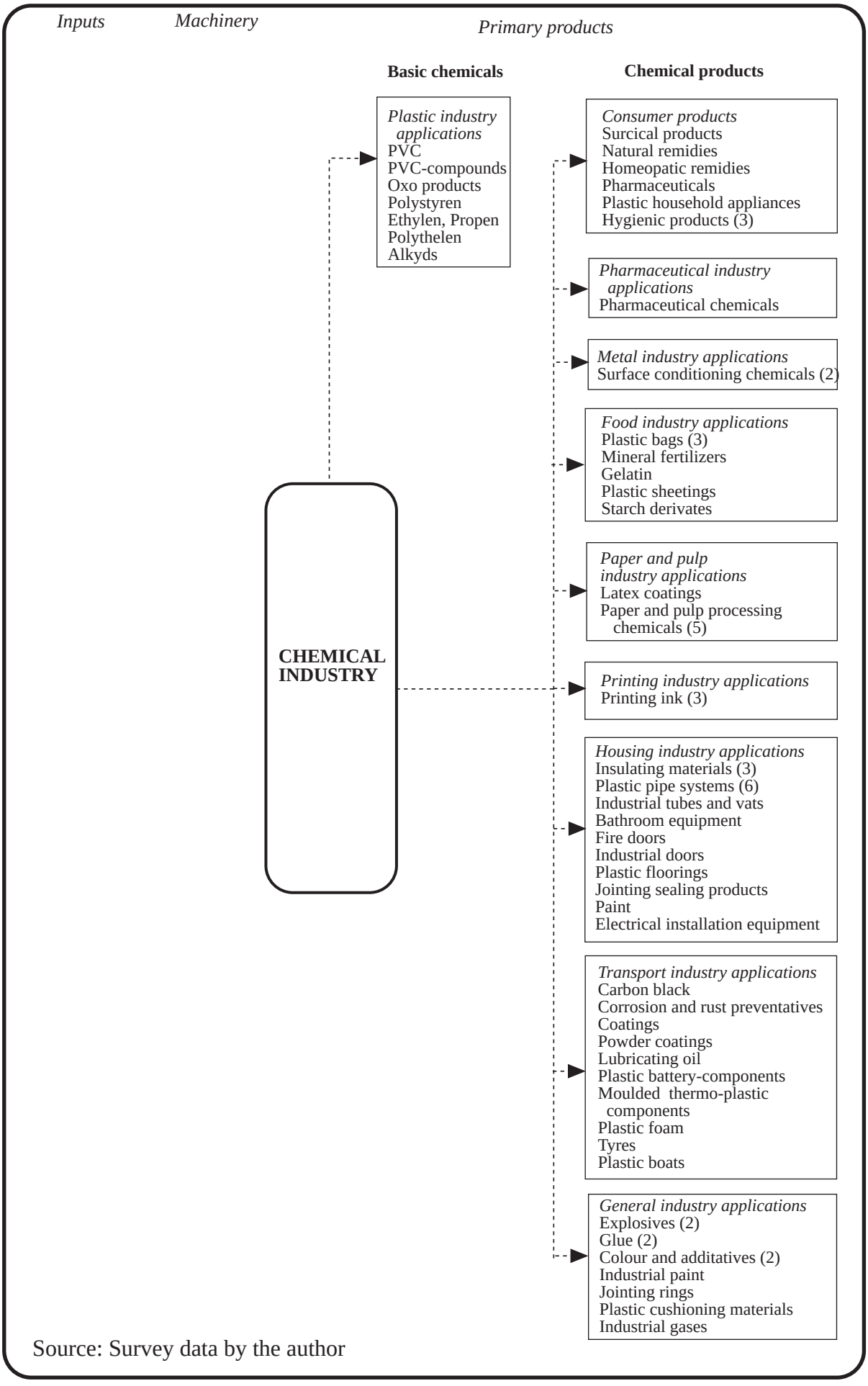


Figure 10.4 *MOFAs operating in the Swedish chemical industry cluster 1993. Each product is represented by one affiliate, except where otherwise indicated.*

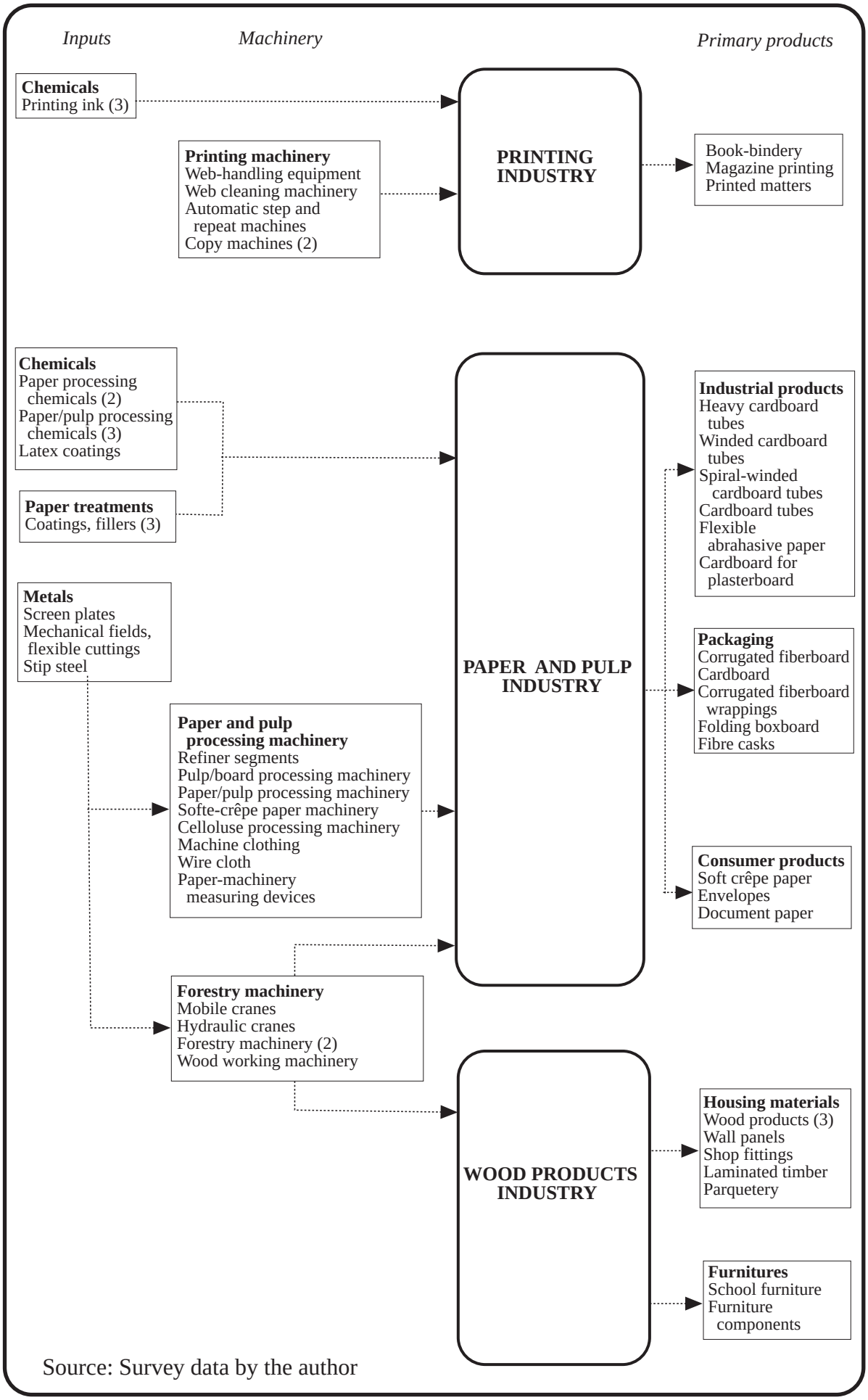


Figure 10.5 *MOFAs operating in the Swedish forest industry cluster 1993. Each product is represented by one affiliate, except where otherwise indicated*

identified as related to this cluster. The forest industry cluster comprises of three related parts; the paper and pulp industry, the wood products industry and the printing industry. If we focus on the paper and pulp industry, the range of products includes different industrial input goods, for example paper and pulp processing chemicals and paper treatments. A relatively large number of MOFAs produce various types of paper and pulp processing machinery, and forestry machinery, while still another group is engaged in manufacturing metals, e.g. screen plates, mechanical fields and strip steel, used by paper and pulp and forestry machinery constructers. The primary products include consumer products, e.g. soft-crêpe paper, envelopes, document paper, as well as industrial goods, e.g. cardboards and fibreboard.

Secondly, MOFAs operating in the wood-products industry manufacture a number of products used for house construction, e.g. wall panels, shop fittings, laminated timber and parquetry. Related to this, a group of forestry-machinery manufacturers can also be found. The third group of MOFAs in the forest cluster are related to the printing industry. Beside producing primary products, such as magazine printing and other printed matters, some MOFAs manufacture different kinds of printing machinery equipment.

10.5.6.Transportation industry cluster

The final, larger group of MOFAs is related to the Swedish transport-industry cluster. In total 48 affiliates (representing 16% of all MOFAs) produce various products, almost exclusively used as input-goods to the transportation industry, see Figure 10.6. Mainly, these input goods include basic metals, (tool steel and speed steel), metal products, (e.g. pipes, tubes, copper strips, castings), and chemical/plastic products, (e.g. corrosion preservatives, coatings, tyres, and thermoplastic parts). In addition to this, a whole variety of other products related to the automotive industry are manufactured, including, glass for car windows, airbag electronics, brake systems, ventilation systems, transmissions, batteries and vehicle seats. As can be seen, only very few affiliates manufacture machinery or primary products. The only examples of machinery constructing affiliates produce infra-red drying cabinets, while the affiliates producing primary products include caravans, garbage cars and plastic boats.

10.5.7 MOFAs operating in other clusters

In Table 10.1, the product range of affiliates, operating in all other industry clusters, can be found. Notice that this table classifies all affiliates strictly from the demand side. This means that the total number of MOFAs operating in the raw-material based clusters, i.e. the metals, forest and chemical clusters are substantially fewer, compared to the cluster charts presented above. For example in this table, a host of metal

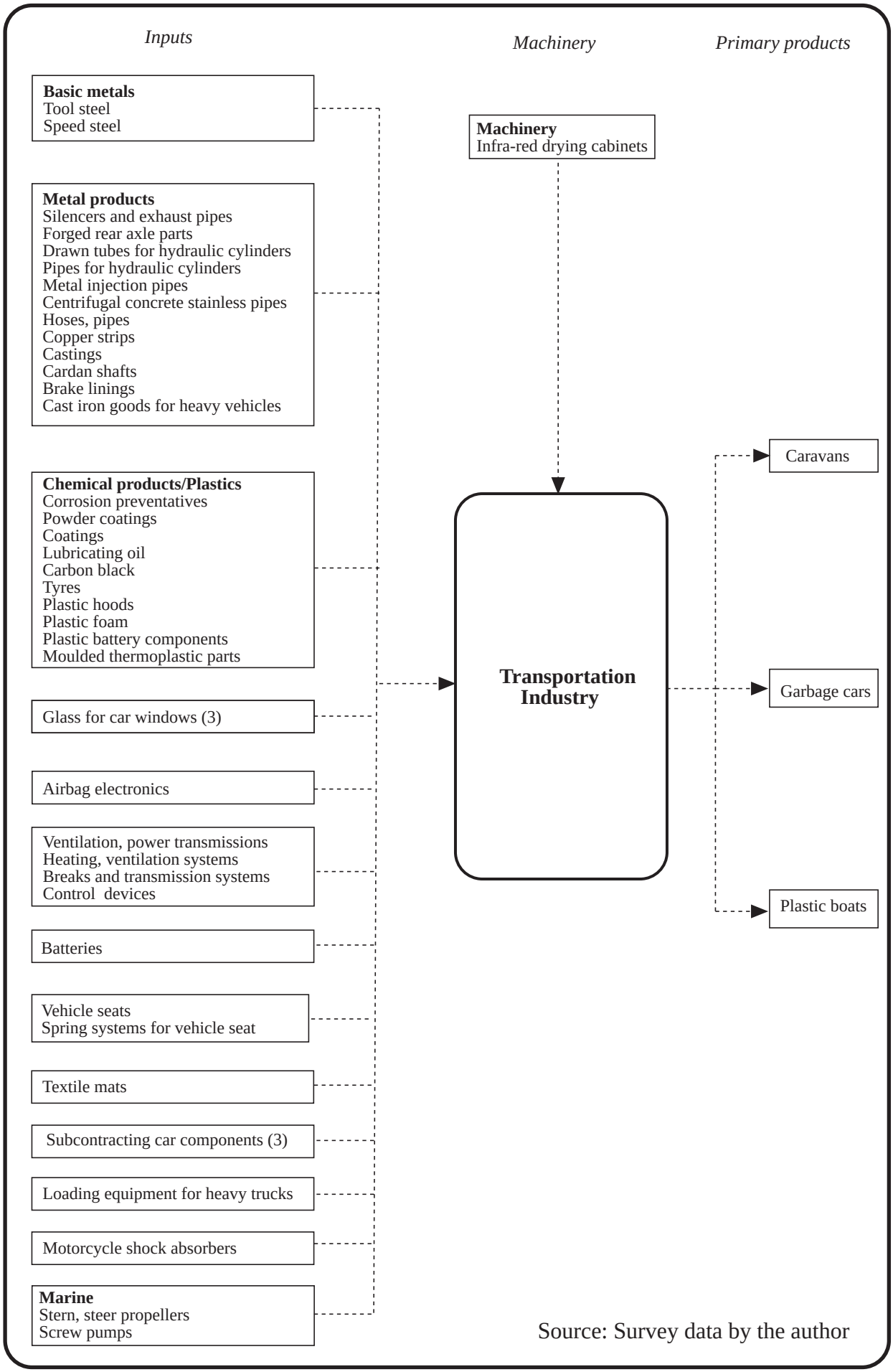


Figure 10.6 *MOFAs operating in the Swedish transport industry cluster 1993. Each product is represented by one affiliate, except where otherwise indicated*

Table 10.1 *MOFAs operating in Swedish industry clusters 1993. Each product represent one affiliate, except when otherwise indicated.*

METALS/MATERIALS

Primary products

Basic metals	*Metal products*	Metal packages
Strip steel	Electrical sheets	Transmission equipment
Steel rods	Perforated sheets	Metal hose
Steel tubes	Horse-shoe nails	Vacuum-brazed heat exchange parts
Precious metal	Copper alloy castings	Table silver
	Steel rope	Agricultural and garden products
	Magnet systems	Patterns- prototypes

Machinery

Diamond tools (2)	Copper-refinery machinery	Machinery for hot rolling mills

Inputs

Aluminium and copper extrusion components	Metal treatments, coatings	Surface conditioning chemicals (2)
	Alloys powder	

FOREST

Primary products

Paper products	Corrugated fibreboard	Document paper
Heavy cardboard tubes	Cardboard	Flexible abrasive paper
Winded, heavy cardboard tubes	Corrugated fibreboard wrappings	*Printing*
Spiral winded cardboard tubes	Folding boxboard	Printed matters
Cardboard tubes	Soft crêpe paper	Bookbindery
Fibre casks	Envelopes, paper products	Magazines (Printing)

Machinery

Forestry	Pulp/board processing machinery	*Printing*
Mobile cranes	Paper/pulp processing machinery	Web-handling equipment
Hydraulic cranes	Soft crêpe-paper machinery	Copy machines (2)
Forestry machinery (2)	Cellulose processing machinery	Web-cleaning machinery
Wood-working machinery	Paper-machinery measuring devices	Automatic step and repeat machines
Paper and pulp	Machine clothing	
Refiner segments	Wire cloth	

Inputs

Paper and pulp	Mechanical fields, flexible cuttings	*Printing*
Coatings, fillers (3)	Strip steel	Printing ink (3)
Latex coatings	Screen plates	
Paper/pulp processing chemicals (5)		

CHEMICALS

Primary products

Alkyds	Polystyrene	Colour /additive concentrates
PVC-compounds	Ethylene, propene	Industrial paints
Oxo products	Polystherene	Paint and additatives
Polyvinyl chloride (PVC)		

COMPUTERS

Primary products

Computers

Inputs

Wafers

Continued

Table 10.1, *Continued*

MULTIPLE

Primary products

Fire-brigade breathing apparatus	Industrial batteries	Gasoline pumps
Explosives (2)	Nickel cadmium batteries	String bags
Hand-gun ammunition	Nonwowen materials	Brushes

Machinery

Soot blowers	Measuring devices	Proximity switches
Compact heat exchanges	Helical-geared motors	Condensing apparatus
Motion controls		

Inputs

Industrial glue	Joining rings for hearing protection products
Plastic cushioning materials	Electric-graphite brushes (2)
Glue, adhesives	Industrial gases

TRANSPORT

Primary products

Caravans	Garbage cars	Plastic boats

Machinery

Infra-red drying cabinets for car spraying

Inputs

Automotive	Moulded thermo-plastic parts	Brake linings
Speed steel	Sound absorbing products	Cardan shafts
Tool steel	Spring systems (vehicle seats)	Hoses, pipes
Corrosion preventatives	Vehicle seats	Copper strips
Powder coatings	Forged rear-axle parts	Castings
Coatings	Heating/ventilation systems	Cast iron goods for heavy vehicles
Lubricating oil	Ventilation, power transmission	Airbag electronics
Carbon black	Brakes and transmission systems	Control instruments, measuring devices
Plastic battery-components	Silencers and exhaust pipes	Glass for car windows (3)
Batteries, accumulators	Metal injection pipes	Loading equipment for heavy trucks
Tyres	Drawn tubes for hydraulic cylinders	Motorcycle shock absorbers
Textile mats for vehicles	Pipes for hydraulic cylinders	*Marine*
Plastic hoods	Centrifugal concrete stainless pipes	Stern-, steer propellers
Plastic foam	Subcontracting car-components (3)	Screw pumps, commercial marine

POWER GENERATION/DISTRIBUTION

Primary products

High tension industrial switches	Water turbines	Power station pressure vessels
Power-, telecommunication cables and wires (2)	Medium-tension switches and switchboards	Steam and hot water boilers Diesel/gas driven power systems

OFFICE

Primary products

Metal cases for computers
Automatic cash dispensing machine equipment
Automatic cash dispensing machines
Cash-register systems
Punches

Continued

Table 10.1, *Continued*

	FOOD	
Primary products		
Catering	Ice cream	Liquid drinks, milk powder,
Spices	Pickled herring, vinegar	cereal food for infants,
Candy products	Biscuits	confectory, frozen food
Snacks	Whole-meal bread	Prefabricated soups, sauces
Chocolate	Crisp bread	desserts, margarine, yoghurt
Coffee	Mustard, ketchup	
Ice-cream wafers		
Machinery		
Large-kitchen machinery	Refrigerated milk tanks	
Glass-working machinery	Slaughter-house installations	
Inputs		
Mineral fertilizers	Starch derivates	Plastic bags for bakeries
Flavours (2)	Gelatin	Plastic bags
		Plastic sheets
	TEXTILES/APPAREL	
Primary products		
Working clothes	Thread	Protective clothing for aircraft crew
	HOUSING/HOUSEHOLD	
Primary products		
Light fittings (2)	Curtain equipment	Stove fans
Stainless fittings	Sunblinds	Micro-wave ovens
Desk lamps	School furniture	Plastic household appliances
Electric signs	Office furniture	Washing machines, dishwashers
		Refrigerators
Machinery		
Submersible drainage pumps	Venetian blind machinery	Heating and ventilation control systems
Inputs		
Ventilation, heating, sanitation	Parquetry	Shop fittings
Step screens (waste water)	Fibre glass	Wall panels
Industrial tubs/vats	Insulating materials (2)	Panel, partions
Polythelene tubes	Polystyrene insulating materials	Safety door locks
Sewage pipes/parts	Sound absorbing materials	Fire doors
Plastic tubings	Insulating glass	Industrial doors
Plastic tube-system	Cellular insulation materials	Elevator components
Plastic tubes	Joining ceiling products	Elevators, escalators
Welding steel pipes	Nail plates	Sanitary ware
Cross-linked polyhtelene tubing	Reinforcing bars	Bathroom equipment
Copper tubes	Lightweight clinker	Bathroom systems
Brass rods	Clinker	Bathroom fans
Heating, water, sanitation pumps	Roofing tiles	Surface-conditioned steel tubes
Building materials	Electrical switches and switchboards	Stainless kitchen tables and sinks
Wood products	Electrical installation equipment	Dirt and water absorbent mats
Laminated timber	Safety door locks	Venetian blinds and parts
Cardboard for plasterboard	Radiators (2)	
Plasterboard	Plastic flooring	
Furniture components	Paint	

Continued

Table 10.1, *Continued*

	HEALTH CARE	
Primary products		
Surgical products	Pharmaceuticals	Medical-technical products
Natural remedies	Elevators for disabled	Hearing aids
Homeopathic remedies	Optics	
Machinery		
Diagnostic instruments		
Inputs		
Non-woven materials	Pharmaceutical chemicals	
	PERSONAL	
Primary products		
Pencils	Shampoo, liquid soaps	Hygienic products (2)
	ENTERTAINMENT	
Primary products		
CD-records	Satellite receivers	
Sports-products (3)	Jig-saw puzzles	

Note: All clusters are seen from the demand side, which means that no double counting exists, cf. Figure 10.1.

Source: Survey data by the author

products is classified as related to e.g. the transportation cluster, but not to the metal cluster. In contrast from Figure 10.1 above, no double counting of MOFAs operating in more than one cluster, are made in this table.

In the multiple business cluster, 24 MOFAs (representing 8% of all affiliates), a variety of products with general industrial applications are made, including primary products such as industrial batteries, explosives and non-woven materials, as well as machinery equipment, e.g. soot blowers, heat exchanges, proximity switches and other measuring devices. Finally, a number of these MOFAs also produce inputs, e.g glue, gases, plastic cushioning materials, used in a host of different industries.

A small number of MOFAs operate in the internationally competitive power generation and distribution industry cluster. In total, 8 affiliates (representing 3% of all MOFAs), can be related to this cluster, manufacturing power and telecommunication cables and wires, water turbines, diesel driven power systems, power station pressure vessels, steam boilers and industrial switches.

Only very few MOFAs (representing 2% of all MOFAs), can be found in the office cluster, producing automatic cash dispensing machines and cash register systems.

In the food and beverage cluster 27 affiliates operate (representing 9% of all MOFAs). In contrast to most other clusters, MOFAs in this cluster produce a variety of consumer goods, including frozen foods, snacks, ice-cream, coffee and a host of prefabricated foods. At the same time, producers of machinery and inputs goods used in the food industry, can also be found.

Finally, in the computer, health care, personal and entertainment clusters, only very few MOFAs can be found, most of which produces consumer products, while in the telecommunication and defence industry clusters no MOFAs can be identified at all.

10.6 Geographical locations of MOFAs operating in different industry clusters

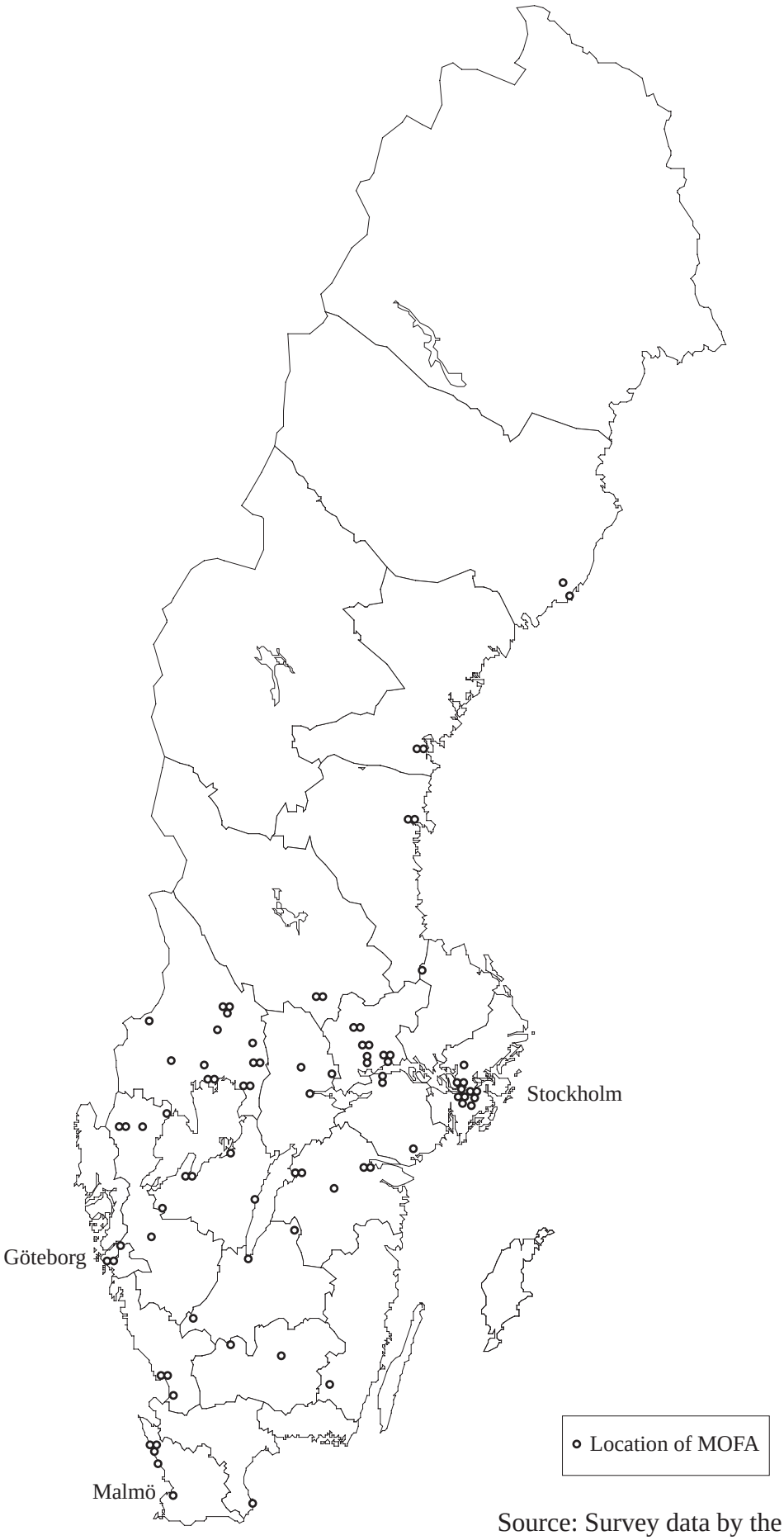
As was discussed in section 10.2 above, in recent years, scholars from various disciplines have identified geographical clusters of industries as an important generator of international competitiveness. Although the specific scale of these geographical clusters varies substantially from the local to the nation level, it is suggested that the geographical proximity of inter-related firms is an important variable when explaining why certain firms and regions become internationally competitive in certain industries. Although no detailed account is made to analyse the sub-national geographical location of MOFAs in the present study, some maps, showing the spatial distributions of affiliates operating in various clusters, will be presented.

In order to analyse the possible existence of any specific tendency for MOFAs operating in specific industry clusters to be located in certain regions, Figures 10.7 to 10.9 show the geographical location of all MOFAs operating in the three larger, competitive metals, forest and transport industry clusters, respectively, while Figure 10.10 shows the geographical location of all MOFAs which cannot be related to any of the competitive Swedish clusters.

The general conclusion of the analysis of these maps is that, on a sub-national level, it is not possible to find a strong tendency for cluster affiliates to be located in certain areas. Instead the picture that emerges shows that the location of these MOFAs tend to follow that of the general location-pattern of the individual Swedish industries (cf. SNA 1995). Non-cluster affiliates, on the other hand are located mainly in the larger Swedish metropolitan areas.

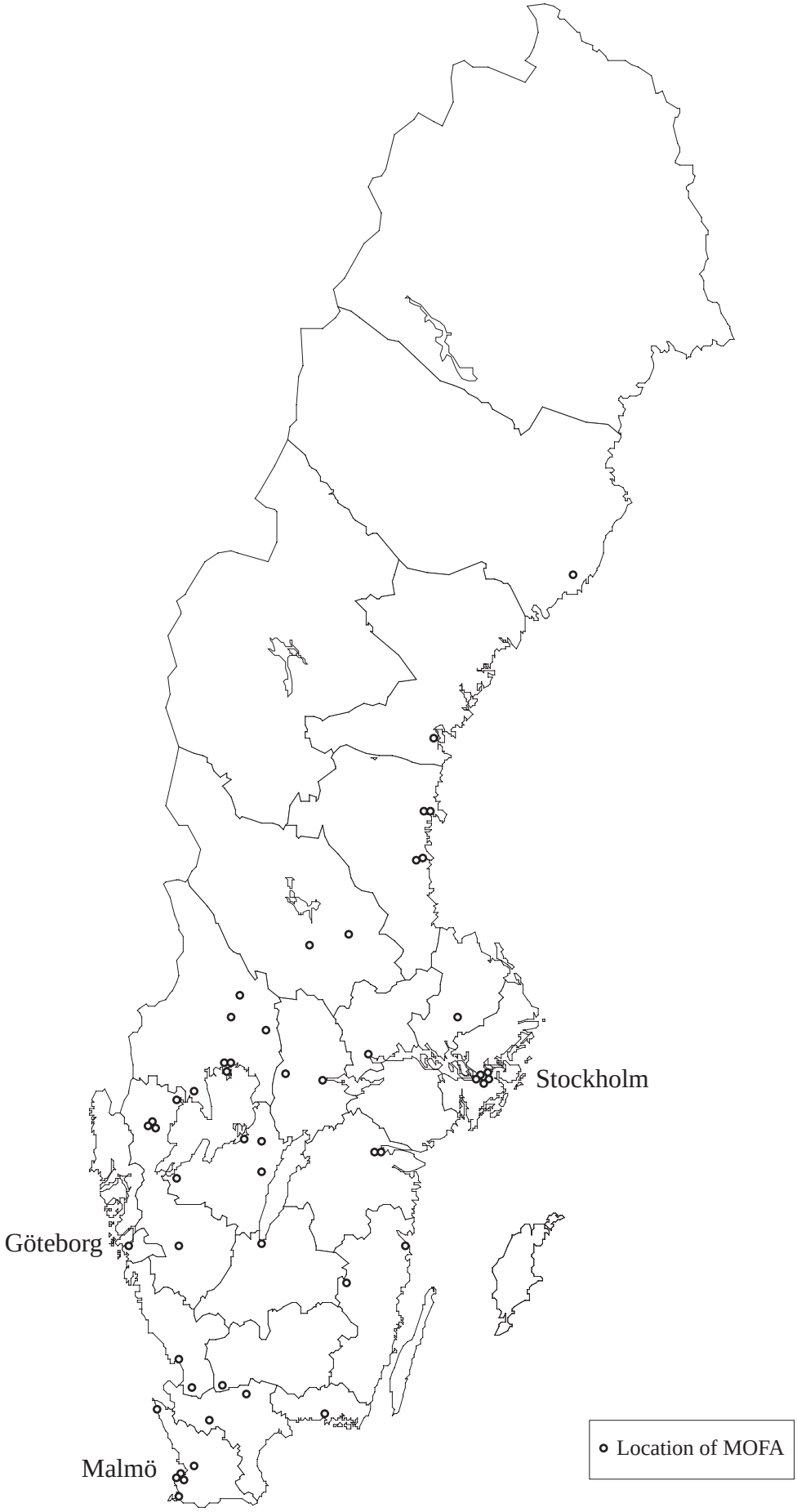
10.7 MOFAs operating in competitive Swedish industry clusters

This section analyses the extent in which MOFAs tend to operate in competitive Swedish industry clusters. Above, five Swedish clusters were identified as especially internationally competitive: the forest-, materials/metals-, transportation-, power generation, transmission and distribution- and telecommunication industry clusters. Figure 10.11, shows to what extent MOFAs can be related to any of these competitive Swedish industry clusters, alternatively operate in other clusters. As can be seen, a comparable large number of MOFAs operate in three of the five internationally competitive Swedish clusters: the material/metals, the forest and the transportation clusters. In addition, a small number of MOFAs also operate in the power generation and distribution cluster. In the fifth competitive Swedish cluster, the tele-



Source: Survey data by the author

Figure 10.7 *Geographical locations of MOFAs operating in the Swedish metal industry cluster 1993*



Source: Survey data by the author

Figure 10.8 *Geographical locations of MOFAs operating in the Swedish forest industry cluster 1993*

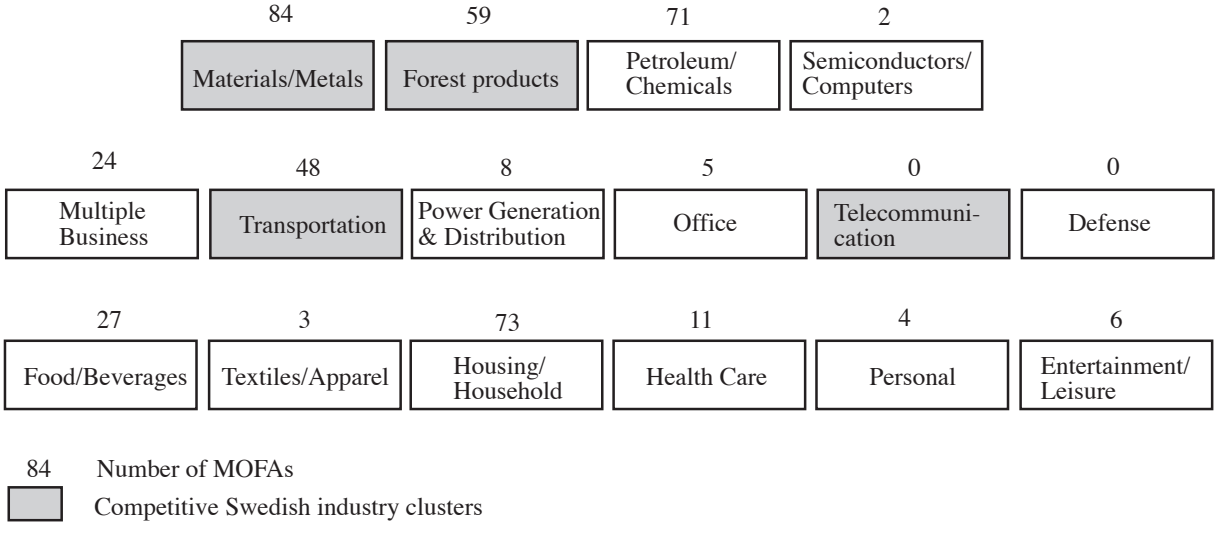
Source: Survey data by the author

Figure 10.9 *Geographical locations of MOFAs operating in the Swedish transport industry cluster 1993*

Source: Survey data by the author

Figure 10.9 *Geographical locations of MOFAs operating in the Swedish transport industry cluster 1993*

communication cluster, no MOFA can be found. In total, 167 affiliates can be related to any of the internationally competitive Swedish industry clusters, while 129 affiliates operate in other industries. This suggests that over half of MOFAs (56%), operate in industries which can be related to internationally competitive Swedish industry clusters, while 44 percent are not related to any of these competitive clusters. In the subsequent analysis the former will be identified as "cluster-affiliates", and the latter "non-cluster affiliates". As can be noticed, these figures are slightly different from those presented in Figure 10.11. The reason for this is that, contrary to the figures presented in that figure, in the estimates of the total number of MOFAs which can be classified as cluster and non-cluster affiliates, no double counting exists. Instead, all MOFAs related to any of the competitive Swedish clusters are classified as a cluster affiliate, even if this affiliate can also be classified in an cluster which is not among those identified as internationally competitive. For example, an affiliate manufacturing parquetry, is classified as a cluster affiliate, related to the internationally competitive forest industry cluster. At the same time, it is also related to the Swedish housing industry cluster which is not among those found to be internationally competitive. In this situation, the particular affiliate is classified as a cluster affiliate. Another circumstance which partly explains the difference between the numbers in Figure 10.11 and the estimates of total number of MOFAs operating in competitive industry clusters, is due to the fact that an affiliate which at the same time can be related to two, or more, competitive clusters, e.g. a producer of tool steel, which is related to the metals cluster, as well as to the transportation cluster, is only included once in the figures of total numbers of cluster affiliates.



Note: Some double counting exists. The metal, forest and chemical cluster are seen from the supply side, the other clusters from the demand side, which mean that around 30 MOFAs are classified in more than one cluster.

Source: Survey data by the author

Figure 10.11 *MOFAs operating in competitive and non-competitive Swedish industry clusters*

10.8 Integrated international production in MOFAs operating in different industry clusters

10.8.1 Exports and local sales

Having examined the distribution of MOFAs between different industry clusters in Sweden, above, we are now in a position to analyse some possible variations in terms of integrated production. To what extent, then, are cluster and non-cluster MOFAs focused on host market production and exports? From a theoretical point of view, two different scenarios are possible. On the one hand, MOFAs operating in competitive Swedish industry clusters, may focus on host market sales, supplying competitive Swedish companies with industrial input goods. On the other hand, it is also plausible to suspect that affiliates operating in competitive Swedish industry clusters, to a large extent also hold competitive advantages, facilitating exports. In addition, supplying competitive, Swedish companies with industrial inputs for their operations in Sweden, may also generate export-sales, since many of these Swedish companies are also involved in substantial amounts of foreign production. Hence, a supplier of international competitive Swedish TNCs to their Swedish operations, may also be a supplier to their foreign located operations.

Before presenting the findings on manufactured sales, it can be noticed that non-cluster MOFAs to a larger extent, compared to cluster affiliates, operate as marketing channels on behalf of parent- and/or sister-firms through resale activities. Among non-cluster MOFAs, 60 percent indicate that they are involved in resale activities on behalf of parent- and/or sister-firms, accounting for 17 percent of total sales. Among cluster-MOFAs, a smaller share (43%) are involved in resale activities, at the same time this accounts for only 8 percent of these affiliates' total sales.

Turning to manufactured sales, Table 10.2 shows the sales-markets of cluster and non-cluster MOFAs. On the whole, MOFAs operating in competitive Swedish industry-clusters, seem to be somewhat more export intensive, compared to the rest of MOFAs, although the difference is not dramatic. While MOFAs operating in competitive clusters export 58 percent of manufactured sales, the corresponding figure for non-cluster affiliates is 47 percent. The importance of different export markets tends, to be the same for all MOFAs.

Table 10.2 *Percentages manufactured sales in different markets by MOFAs located in Sweden 1993 in cluster and non-cluster affiliates*

Type of MOFA	Sweden	Nordic excl. Swe	Western Europe	Russia/ East Europe	North America	Latin America	Japan/ SE Asia	Rest of world	Total	N
Cluster-affiliates	42	12	27	1	8	1	5	3	100	167
Non-cluster affiliates	53	11	24	1	3	1	6	2	100	129
TOTAL	47	11	26	1	6	1	6	2	100	296

Source: Survey data by the author

The tendency for cluster affiliates to be more export intensive, compared to the others, is, however, further supported if we analyse the proportion of affiliates which are non-exporters, respectively, exporting most of their manufactured sales, see Table 10.3. Among cluster affiliates, 45 percent export most of manufactured sales, while 8 percent are non exporters. Corresponding figures for non-cluster affiliates are 31 percent and 13 percent, respectively.

Table 10.3 *Percent exports in manufactured sales in MOFAs located in Sweden 1993, in cluster and non-cluster affiliates. Percent of firms.*

Type of MOFA	0%	1-10%	11-25%	26-50%	51-75%	76-100%	Total	N
Cluster-affiliates	8	14	19	14	20	25	100	167
Non-cluster affiliates	13	17	16	24	11	20	100	129
TOTAL	10	15	18	18	16	23	100	296

Source: Survey data by the author

Although it seems that cluster affiliates, taken as a group, seem to be somewhat more export intensive, some variations in export intensities among affiliates operating in different competitive Swedish clusters can also be identified. According to Table 10.4, we find that, especially in the metals industry cluster, almost three quarters of all manufactured sales are exported. Also in the forest cluster, a substantial degree of exports can be identified, reaching almost 60 percent of total manufactured sales. MOFAs in the other two competitive Swedish industry clusters, i.e. transportation and power generation, show a lower level of exporting. MOFAs operating in two of the larger clusters, which are not identified as being among the internationally competitive Swedish clusters, i.e. chemicals and housing, show export intensities comparable to those found among affiliates which operate in the competitive Swedish forest and power generation clusters. Among the smaller industry clusters, substantial shares of exports are identified among MOFAs operating in the health care, entertainment and office clusters; although it should be noticed that these clusters consist of very few affiliates. The relatively smallest proportions of exports can be found among MOFAs operating in the food, textiles and personal clusters. Finally, independently of cluster, MOFAs engaged in producing machinery are generally highly export intensive.

10.8.2 Intra-firm sales

Non-cluster affiliates seem to be substantially more involved in intra-firm sales of manufactured output, see Table 10.5. While cluster affiliates internalize around one quarter of total exports, non-cluster MOFAs internalize as much as 69 percent of their export sales, indicating that non-cluster affiliates to a substantial degree are dependent on parent-corporations' international sales organisation, while cluster

Table 10.4. *Exports of total manufactured sales, respectively, imports of total purchases of material inputs by MOFAs located in Sweden 1993. Percent.*

	Metals		Forest		Chemicals		Computers	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
Primary products	71%	56%	47%	25%	48%	70%	100%	5%
Machinery	74%	45%	79%	48%	-	-	-	-
Inputs	64%	37%	44%	65%	-	-	90%	67%
Total	*71%*	*55%*	*59%*	*44%*	*48%*	*70%*	*100%*	*6%*

	Multiple		Transportation		Power generation/ distribution		Office	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
Primary products	59%	42%	51%	25%	47%	39%	75%	25%
Machinery	80%	57%	89%	20%	-	-	-	-
Inputs	34%	67%	49%	68%	-	-	-	-
Total	*57%*	*50%*	*50%*	*66%*	*47%*	*59%*	*75%*	*25%*

	Defence		Food/Beverages		Textiles/Apparel		Housing/ Household	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
Primary products	-	-	18%	47%	35%	50%	68%	49%
Machinery	-	-	81%	59%	-	-	96%	56%
Inputs	-	-	56%	96%	-	-	41%	44%
Total	-	-	*27%*	*55%*	*35%*	*50%*	*59%*	*46%*

	Health care		Personal		Entertainment/leisure	
	Exports	Imports	Exports	Imports	Exports	Imports
Primary products	85%	61%	19%	70%	80%	56%
Machinery	88%	9%	-	-	-	-
Inputs	85%	100%	-	-	-	-
Total	*85%*	*63%*	*19%*	*70%*	*80%*	*56%*

Note: Some double counting exists. The metal, forest and chemical clusters are seen from the supply side, the other clusters are seen from the demand side, which means that around 30 MOFAs are classified in more than one cluster.

Source: Survey data by the author

Table 10.5 *Percent intra-firm exports of manufactured sales, and, percent intra-firm exports of manufactured exports, by MOFAs located in Sweden 1993 in cluster and non-cluster affiliates*

Type of MOFA	Percent intra-firm exports of manufactured sales			Percent intra-firm exports of manufactured exports	N
	Finished goods	Material inputs	Total		
Cluster-affiliates	14	1	16	26	167
Non-cluster affiliates	33	2	35	69	129
TOTAL	23	1	25	44	296

Source: Survey data by the author

affiliates, to a larger extent, seem to operate their own sales-organisation.

The tendency for non-cluster affiliates to be more involved in intra-firm exports is also indicated in Table 10.6, which shows that as many as 80 percent of these affiliates are involved in at least some intra-firm exports, while the corresponding figure for cluster affiliates is lower, or 59 percent. Furthermore, we see also that as many as 45 percent of non-cluster affiliates export most of their manufactured output on an intra-firm basis, compared to one quarter among cluster affiliates.

Table 10.6 *Percent intra-firm exports of manufactured exports by MOFAs located in Sweden 1993, in cluster and non-cluster affiliates. Percent of firms with exports.*

Type of MOFA	0%	1-10%	11-25%	26-50%	51-75%	76-100%	Total	N
Cluster-affiliates	41	7	10	16	14	12	100	153
Non-cluster affiliates	20	6	10	20	16	29	100	113
TOTAL	32	7	10	18	15	19	100	266

Source: Survey data by the author

10.8.3 Imports or domestic purchasing of material inputs

Theoretically, in terms of the sourcing of material input goods, it seem likely that cluster affiliates would be relatively more involved in sourcing from suppliers in Sweden, compared to the other affiliates, since, being part of a competitive domestic cluster may involve a substantial degree of inter-firm networking activities between suppliers and customers of industrial inputs. On the other hand, since a comparably larger proportion of cluster MOFAs seem to be more exposed to competitive international markets through exports, this may force cluster affiliates to search for inputs of higher quality or lower prices among suppliers abroad.

The empirical findings on the share of imports in total purchasing of material inputs by MOFAs operating in different industry clusters was shown in Table 10.4, above. It

can be seen that the highest shares of imports are found among MOFAs operating in the chemical, personal, transportation and health care clusters, where two thirds, or more of materials are sourced from suppliers abroad. By contrast, in the office, forest, and household clusters, inputs are mainly sourced from suppliers located in Sweden.

On the whole, no significant difference in purchasing markets between cluster affiliates, taken as a group, compared to non-cluster affiliates, seems to exist, although the former, marginally, are purchasing material inputs from suppliers in Sweden and other Nordic countries to a larger extent, compared to the latter, see Table 10.7. The proportion of purchases from suppliers in Sweden and other Nordic countries is 61 percent for cluster affiliates, compared to 54 percent among non-cluster affiliates. In both categories, around one third of material are purchased from suppliers in Western Europe, while non-European purchases are small, especially among cluster affiliates.

Table 10.7 *Percent purchases of material inputs in different markets by MOFAs located in Sweden 1993 in cluster and non-cluster affiliates.*

Type of MOFA	Sweden	Nordic excl. Swe	Western Europe	Russia/ East Europe	North America	Latin America	Japan/ SE Asia	Rest of world	Total	N
Cluster-affiliates	47	14	34	1	1	0	2	0	100	167
Non-cluster affiliates	43	11	32	2	5	1	2	3	100	129
TOTAL	45	13	33	2	3	1	2	2	100	296

Source: Survey data by the author

The tendency towards relatively similar purchasing behaviour between the two group of affiliates is also supported if we analyse the proportion of affiliates that are non-importers and very import-intensive, see Table 10.8. Here it can be seen that only very few affiliates, exclusively purchase material inputs from suppliers in Sweden, while around 45 percent of cluster affiliates, as well as non-cluster affiliates, import most of their inputs from abroad.

Table 10.8 *Percent imports of total purchases of material inputs by MOFAs located in Sweden 1993, in cluster and non-cluster affiliates. Percent of firms.*

Type of MOFA	0%	1-10%	11-25%	26-50%	51-75%	76-100%	Total	N
Cluster-affiliates	7	8	14	25	16	29	100	163
Non-cluster affiliates	2	9	17	23	20	28	100	133
TOTAL	5	8	16	25	18	29	100	296

Source: Survey data by the author

10.8.4 Intra-firm purchasing

The extent of intra-firm purchasing of material inputs may show some different structures, e.g. cluster affiliates being supposed to purchase relatively less from parent-firms and more from independent suppliers related to their industry cluster, while non-cluster affiliates to a larger extent may be supplied by parent-firms. However, as can be seen in Table 10.9, marginal differences in terms of intra-firm purchasing seems to exist between the two groups of firms. Almost one fifth of purchases seem to be internalized, while around 30 percent of imports are organized as intra-firm imports in both categories of affiliates.

Table 10.9 *Percent intra-firm purchases of total purchases of material inputs, and, percent intra-firm imports of total imports of material inputs, by MOFAs located in Sweden 1993, in cluster and non-cluster affiliates.*

Type of MOFA	Total intra-firm purchases of total purchases of material inputs	Percent intra-firm imports of total imports of material inputs	N
Cluster-affiliates	17	30	167
Non-cluster affiliates	18	28	129
TOTAL	18	29	296

Source: Survey data by the author

The similarity in terms of intra-firm imports is also striking in Table 10.10, which shows that an equally large share (52%) of cluster and non-cluster affiliates seem to be engaged in intra-firm imports of material inputs.

Table 10.10 *Percent intra-firm imports in total imports of material inputs 1993, in MOFAs located in Sweden 1993, in cluster and non-cluster affiliates. Percent of firms.*

Type of MOFA	0%	1-10%	11-25%	26-50%	51-75%	76-100%	Total	N
Cluster affiliates	52	7	10	9	11	11	100	167
Non-cluster affiliates	52	7	6	13	11	11	100	129
TOTAL	52	7	8	11	11	11	100	296

Source: Survey data by the author

10.8.5 Intra-corporate coordination of different functional activities

According to Table 10.11, in terms of intra-corporate coordination of different functional activities, only marginal differences seem to exist between cluster and non-cluster affiliates, although cluster affiliates tend to be somewhat less involved in intra-corporate coordination in most of the functional activities. The share of cluster

Table 10.11 *Intra-corporate coordination in different parts of the value chain in MOFAs located in Sweden 1993, in cluster and non-cluster affiliates. Percent*

Coordinated activity	Cluster affiliates N=167	Non-cluster affiliates N=129
R&D	59	64
Procurement	30	33
Input quality control	7	129
Production	15	18
Output quality control	6	9
Marketing	43	44
Sales	29	28
Distribution	15	17
After-sale services	15	20
Finance	63	71
Administration	25	33

Source: Survey data by the author

affiliates indicating no coordination in any functional area is 11 percent, compared to 3 percent among non-cluster affiliates.

The only substantial difference between cluster and non-cluster affiliates in terms of what is perceived as the most important resources received by parent- and sister-firms, is related to product technology, see Table 10.12. This type of resource seems to be somewhat more cited as being among the most important by cluster affiliates, compared to non-cluster affiliates.

Table 10.12 *Type of intra-corporate received resources cited as being among the three most important in MOFAs located in Sweden 1993. Percent in cluster and non-cluster affiliates.*

Type of MOFA	Product technology	Process technology	Other type of know-how	International marketing organization	International procurement organization	Corporate goodwill	Scale-economies	Finance	N
Cluster-affiliates	52	26	35	42	23	37	20	56	167
Non-cluster affiliates	41	24	37	48	20	29	22	59	129
TOTAL	47	25	36	45	22	33	21	57	296

Note: Total number of most important sources cited may not sum up to total number of firms, because some firms cited more or less than three sources as most important.

Source: Survey data by the author

10.8.6 Inter-firm and intra-corporate technological cooperation

One of the most significant aspects of agglomeration economies is related to the collective learning process between suppliers, customers and other firms related to a specific industry cluster. In this section, an analysis of the extent of technology-cooperation between MOFAs and external firms, e.g suppliers and customers, on the one hand, and between MOFAs and other parts of their parent-corporations, on the other, is presented. The focus of this analysis is on identifying possible differences, in terms of technological cooperation, with external firms and corporate firms, among cluster and non-cluster affiliates. Cluster firms, may, theoretically, be suspected of being engaged in more extensive cooperation with external firms located in Sweden, compared to other MOFAs, since one of the main attributes of an industrial cluster is the localized pool of knowledge of products and methods circulating between firms constituting the cluster. Non-cluster affiliates, on the other hand, may, theoretically, be suspected of being engaged in less inter-firm collaborative arrangements with external firms in Sweden, due to a loser network of related firms.

In Table 10.13, some indications of organized, technological cooperation between MOFAs and corporate firms, external firms (suppliers/customers) and R&D institutions located in Sweden and abroad are given. Firstly, what can be seen in the Table is that around 80 percent of MOFAs in both categories have at least some organized technological cooperation with corporate firms abroad.

Around three quarters of all affiliates indicate that they are involved in some forms of organized technological cooperation with external firms in Sweden, while a somewhat smaller proportion are engaged in cooperation with external firms abroad. The share of MOFAs engaged in at least some organized technological cooperation with R&D institutions is proportionally lower, especially in relation to R&D institutions abroad. Notice also the generally small difference between cluster and

Table 10.13 *Percent of MOFAs located in Sweden 1993 indicating organized technological cooperation with other corporate firms, external firms (suppliers/customers) and R&D institutions, in cluster and non-cluster affiliates.*

Type of MOFA	Corporate firms in Sweden	Corporate firms abroad	External firms in Sweden	External firms abroad	R&D inst-itutions in Sweden	R&D inst-itutions abroad
MOFAs indicating ate least some technological cooperation						
Cluster affiliates	30	82	78	60	46	18
Non-cluster affiliates	26	80	71	57	44	19
MOFAs indicating "a large" or "very large" extent of technological cooperation						
Cluster affiliates	13	41	23	8	1	0
Non-cluster affiliates	9	40	11	10	7	4

Source: Survey data by the author

non-cluster affiliates indicating at least some technological cooperation with the identified categories of firms.

If we focus instead on the share of affiliates saying that they have a "large" or "very large" technological cooperation with corporate firms, external firms and R&D institutions, a somewhat different picture emerges. Firstly, a much smaller proportion of affiliates indicate that the extent of technological cooperation with the different identified firms can be regarded as "large" or "very large", compared to those claiming that they are involved in at least some organized technological cooperation. Secondly, the importance of corporate firms abroad as a partner for extensive technological cooperation, is clearer. Thirdly, and most interesting, a larger share (23%) of cluster affiliates indicate that they are involved in extensive technological cooperation with external firms in Sweden, compared to non-cluster affiliates (11%). This suggests that inter-firm technological cooperation between MOFAs and suppliers/customers might be more frequent among MOFAs which operate in competitive Swedish cluster, compared to other affiliates.

In Table 10.14, some indications are given on what the managers of MOFAs perceive as the most important source for generating their technological competencies. Only small differences in what is perceived as the most important technology-generating source seem to exist between cluster and non-cluster affiliates. Internally generated competencies are perceived as the most important source by around three quarters of MOFAs, while almost one fifth suggest that corporate firms abroad are most important. External firms, e.g. suppliers and customers in Sweden, are perceived by only 5 percent of MOFAs, as being most important, while external firms abroad and R&D institutions are indicated as most important by a very few MOFAs.

Table 10.14 *Sources of technological competence cited as most important by MOFAs located in Sweden 1993. Percent in cluster and non-cluster affiliates.*

Type of MOFA	Internally generated competence	Corporate firms in Sweden	Corporate firms abroad	External firms in Sweden	External firms abroad	R&D institutions in Sweden	R&D institutions abroad	N
Cluster-affiliates	72	2	19	7	2	1	1	167
Non-cluster affiliates	75	2	17	3	1	2	1	129
TOTAL	73	2	18	5	1	1	1	296

Source: Survey data by the author

The table above indicated only marginal differences in what managers of cluster and non-cluster affiliates perceived as the most important source for generating technological competencies. However, if we focus on the relative importance between external firms and parent-firms, as sources for generating technological competencies, some interesting differences appear. In Table 10.15, the relative importance given to, respectively, external firms in Sweden, external firms abroad,

Table 10.15 *Relative importance of cooperation with external firms compared to corporate firms as a source for generating technology competence, among MOFAs located in Sweden 1993. Percent in cluster and non-cluster affiliates*

Type of MOFA	Cooperation with external firms in Sweden more important	Cooperation with external firms abroad more important	Cooperation with corporate firms in Sweden more important	Cooperation with corporate firms abroad more important	N
Cluster affiliates	31	8	6	49	167
Non-cluster affiliates	22	5	8	60	129
TOTAL	27	6	7	54	296

Note: The balance is accounted for affiliates which indicated that external firms and corporate firms are equally important as technology generating sources. External firms: suppliers, customers, R&D institutions.

Source: Survey data by the author

corporate firms in Sweden and corporate firms abroad, compared to all firms identified, is shown. This is derived by asking the local executive of the affiliates to indicate, in order of significance, the three most important sources of their technological competence (referring to product- as well as process-technology).

Two distinct differences can be seen. Firstly, cluster affiliates indicate to a substantially larger extent that external firms in Sweden are most important. While almost one third of cluster affiliates indicate that external firms in Sweden are more important, for generating technological competence, than other types of firms, corresponding figures for non-cluster affiliates is around 20 percent. Secondly, the importance of corporate firms abroad as a partner for generating technological competencies is more pronounced among non-cluster affiliates. This suggest, again, that some empirical support can be found for the notion of more extensive and localized inter-firm transactions, among MOFAs operating in competitive industry clusters, compared to other affiliates.

10.8.7 Indications of competence centres

In Table 10.16 we find that a somewhat larger share of non-cluster affiliates seem to operate with corporate responsibilities compared to cluster affiliates.

Table 10.16 *Percent of affiliates with corporate responsibilities among foreign-owned affiliates in Sweden 1993 in cluster and non-cluster affiliates*

Type of MOFA	Affiliates with corporate responsibilities	Affiliates with no corporate responsibilities	N
Cluster affiliates	20	80	167
Non-cluster affiliates	26	74	129
TOTAL	23	77	296

Source: Survey data by the author

10.9 Summary

In this chapter an analysis has been presented showing the extent in which MOFAs operate in internationally competitive Swedish industry clusters. In part, this analysis is based on Porter's methodology for identifying different industry clusters. In addition to Porter's methodology, firm-level data have been used in the present study, facilitating a more thorough analysis of all firms, including, not only firms producing various products which can be classified as belonging to certain industry clusters, but also supplying and related firms, which make up the specific industry cluster.

On the one hand, it was presumed that cluster affiliates may be less integrated into the parent-organisations, compared to non-cluster affiliates, since much of the skills and competencies held by cluster affiliates may be generated through interaction with suppliers, customers and other external firms constituting the specific industry cluster. This makes it likely that the degree of backward vertical integration through intra-firm purchasing of material inputs and the extent of intra-corporate technological cooperation may be less pronounced, than in non-cluster affiliates. On the other hand, because cluster affiliates may be engaged in a substantial amount of networking activities with suppliers, customers, and other business partners operating in a competitive national cluster, parent-firms may wish to integrate these affiliates, in order to assimilate capabilities and competencies generated in the competitive cluster with those already possessed by the parent-corporation.

The findings of MOFAs operating in different Swedish industry clusters shows, firstly, that especially five industry clusters have attracted foreign affiliates: the metals, housing, chemicals, forest and transportation industry clusters. An interesting finding of this analysis showed that, over half of MOFAs can be related to four of the internationally competitive Swedish clusters, e.g. the forest-, metals-, transportation- and power generation and distribution clusters. These affiliates are identified as cluster-affiliates. No foreign affiliates can be found in the fifth competitive Swedish industry cluster, the telecommunication cluster. The remaining MOFAs are related to industry clusters in which Sweden has not generated an internationally competitive position. These affiliates are identified as non-cluster affiliates.

The empirical findings of integrated production between cluster and non-cluster affiliates are summarized in Table 10.17. This shows, firstly, that non-cluster affiliates operate as marketing channels to a larger extent than cluster affiliates. If we focus on manufactured sales, it is found that cluster affiliates are more export-orientated, and show a tendency, albeit weak, of being less involved in the Nordic and Western European markets, and, at the same time more involved in exports to non-European markets, compared to non-cluster affiliates. Among cluster affiliates, a somewhat larger share are engaged in at least some export activities, while the number of affiliates identified as export intensive, is substantial larger, compared to non-cluster affiliates. A market difference can be seen in the extent that the two categories of affiliates are involved in intra-firm sales. Here it can be seen that non-cluster affiliates, to a larger

Table 10.17 *Characteristics of MOFAs located in Sweden 1993 by type of industry cluster.*

	Cluster affiliates (N= 163)	Non-cluster affiliates (N=133)
Resale intensity (a)	8%	17%
Affiliates with resale of corporate products	43%	60%
Export intensity (b)	58%	47%
Geographical scope of exports (c)	Nordic 21% WE 47% ROW 31%	Nordic 23%, WE 51% ROW 28%
Exporting affiliates	92%	87%
Export-intensive affiliates (d)	45%	32%
Intra-firm exports (e)	26%	69%
Exporting affiliates with intra-firm exports	59%	80%
Import intensity (f)	53%	57%
Intra-firm imports (g)	30%	28%
Affiliates with intra-firm imports	48%	48%
Intra-corporate coordination	Generally less coordinated Mainly finance and R&D, but also marketing	Generally more coordinated Mainly finance and R&D, but also marketing
Intra-corporate resource flows	Mainly finance and product technology	Mainly finance and marketing
Sources cited as most important for generating technological competence	72% Internal capacity 19% Corporate firms abroad	75% Internal capacity 17% Corporate firms abroad
Affiliates with extensive intra-corporate technological cooperation	41%	40%
Affiliates with extensive inter-firm technological cooperation	23%, mainly in Sweden	11%, in Sweden and abroad
Affiliates claiming external- or corporate firms as more important for generating technological competence	49% Corporate firms 31% External firms in Sweden	60% Corporate firms 22% External firms in Sweden
Affiliates operating as competence centres	20%	26%

Note: For definitions of a-g, see Table 6.1

Source: Survey data by the author

extent are engaged in intra-firm exports, compared to around one quarter among cluster affiliates. A larger share of non-cluster affiliates, being engaged in exports, were also engaged in intra-firm exports, compared to cluster affiliates. In terms of intra-firm exports, among both categories of MOFAs, this consists almost exclusively of finished products, aimed at external customers, while intra-firm exports of material inputs for further processing by corporate firms are marginal.

In terms of purchases of material inputs, no significant difference between the two categories of affiliates was identified. Also, in terms of intra-firm imports, no, or marginal differences in the extent that these were internalized could be identified.

Generally, a larger share of non-cluster affiliates seemed to be involved in intra-corporate coordination of various parts of their value chains, compared to cluster affiliates. Generally, cluster affiliates claimed that the most important resources which were received from parent- or sister-firms were related to finance and product technology, while non-cluster affiliates indicated that these were mainly related to finance and marketing resources.

Only marginal differences were identified regarding the extent in which the two categories indicated that their technological competencies were mainly indigenously generated, alternatively, mainly generated by parent- or sister-firms. Also, no differences were found regarding the extent in which the two categories indicated that they were involved in extensive intra-corporate technological cooperation. However, a clear tendency showed that cluster affiliates were more involved in inter-firm technological cooperation with suppliers and customers in Sweden, than non-cluster affiliates. Also, a significantly larger share of cluster affiliates indicated that cooperation with external firms in Sweden was more important than cooperation with corporate firms, for generating technological competencies.

Finally, in terms of affiliates operating as competence centres, it was found that a larger share of non-cluster affiliates indicated that they had received corporate responsibilities in one or more parts of the affiliates value chain.

It has not been possible to compare the findings with affiliates operating in other countries, or to discuss some changing tendencies during the years, since this probably is one of the first in-depth surveys that has been undertaken regarding the extent that foreign affiliates operate in various industry clusters in host countries. However, the present findings suggest that cluster affiliates are not only focused on host market production, but, on the contrary, are engaged to a greater extent in exports, compared to other affiliates. They also seem to be less involved in intra-firm exports, indicating that they control their own sales organisation. Moreover, the findings also gave some support to the perspective that cluster affiliates, to a greater extent than others, are involved in technological cooperation with suppliers and customers in the host country. For a larger share of cluster affiliates, suppliers and customers in the host country are also more important for generating technological competence, than cooperation with parent- and sister-firms. At the same time, the analysis found no indications that cluster affiliates, more than other affiliates, transfer their competence through technological cooperation with parent- and sister-firms.

11 SOME DETERMINANTS OF INTEGRATED INTERNATIONAL PRODUCTION. A STATISTICAL ANALYSIS

11.1 Introduction

In this chapter, an attempt is made to substantiate the empirical findings of integrated international production, presented in chapters 5 to 10, by applying a statistical analysis of some determinants likely to affect the extent that the operations of individual MOFAs are integrated with other parts of the parent-corporations outside Sweden. The statistical analysis is focused on four aspects of integrated international production: the extent of i) exports; ii) intra-firm exports of manufactured output; iii) intra-firm imports of material inputs; and iv) the degree of intra-corporate technological cooperation. Since almost all of MOFAs' intra-firm exports consist of finished products aimed at external customers, this variable measures intra-firm exports of finished products, *per se*, rather than intra-firm exports, in general.

The chapter continues with a presentation of the dependent and independent variables to be analysed, followed by a discussion of some likely outcomes of the statistical analysis. The statistical model which is applied in the analysis is, thereafter presented. The findings of the analysis are presented and the results discussed on the basis of what could be expected. A final section summarizes the findings of this chapter.

11.2 Some hypotheses

Nine independent variables are included in the analysis in order to examine some likely determinants affecting the extent of integrated international production between MOFAs and other parts of parent-corporations. The first four of the independent variables explicitly capture geographical, or locational-specific, advantages of the host country, that may affect the affiliates' propensity to integrate their Swedish-based operation with that of operations located in other countries. The five other variables are included in order to capture some affiliate-specific attributes likely to affect the extent of corporate integration. Table 11.1 shows the dependent and independent variables included in the analysis, and how the different variables are measured, while Table 11.2 presents a summary of how each of the independent variables is believed to affect the different dependent variables. Below, a brief discussion on each of the independent variables and their likely affect on the independent variables follows.

Raw material based industries (x_1). This first, independent, variable takes into consideration the possibility that export intensive MOFAs are established in industries which, in large, are based on host-country located natural resources. A positive correlation is thus expected between affiliate exports and affiliates operating

Table 11.1 *Measurement of independent variables included in the study*

Dependent variables :

Y_1 EXP: Affiliates' export propensity

Percent of value of sales outside Sweden in total sales of manufactured output.

Y_2 ENEXP: Affiliates' extra-Nordic export propensity

Percent of value of sales outside the Nordic countries in total sales of manufactured output.

Y_3 INTFEX: Intra-firm exports

Percent of the value of intra-firm exports in total exports of manufactured output

Y_4 INTFIM: Intra-firm imports

Percent of the value of intra-firm imports in total imports of material inputs

Y_5 CORPCOOP: Degree of intra-corporate technology cooperation.

Dummy variable 0 = Affiliates indicating 0 and 1 on an ordinal scale, (ranging between 0-4), showing the extent of technological cooperation with corporate firms abroad; 1= affiliates indicating 2, 3 or 4 on the same scale.

Independent variables:

X_1 RAWMTL: Raw material based industries

Dummy: 1= Wood products, Furniture (ISIC 331-332), Paper and pulp (ISIC 341), Iron and steel, Non-ferrous metals (ISIC 371-372). 0 = Others

X2 DOMPUR: Domestic purchases of inputs

Percent of the value of domestic purchases in total purchases of material inputs

X3 DOMCOOP: Degree of domestic inter-firm technology cooperation

Dummy variable 0 = Affiliates indicating 0 and 1 on an ordinal scale, (ranging between 0-4), showing the extent of technological cooperation with external firms in Sweden; 1= affiliates indicating 2, 3 or 4 on the same scale.

X4 CLUSTER: Affiliates operating in competitive Swedish industry-clusters

Dummy: 1 =Affiliates related to competitive Swedish industry-clusters; 0 = Other affiliates

X5 SPECIAL: Specialized affiliates

Sales-value of affiliate's major product as a share of parent corporations' total sales of that product

X6 ENTRY: Mode of entry

Dummy: Green-field investment = 0; Acquisitions = 1

X7 AGE: Age of affiliate

Number of years since affiliate was incorporated or established by parent corporation

X8 SIZE: Size of affiliate

Percent of average employment size of sample MOFAs at ISIC 3-digit level

X_9 HOMBASE: Home country of affiliate

Dummy: European (including Nordic) affiliates = 0 ; Non-European affiliates = 1

Table 11.2 *Expected signs indicated for different independent variables affecting the extent of integrated production among MOFAs located in Sweden 1993*

Variable	Exports	Intra-firm export	Intra-firm imports	Intra-corporate technological cooperation
X1 RAWMTL Raw material based industries	+	+/-	-	+/-
X2 DOMPUR Domestic purchases of inputs	+/-	+/-	-	-
X3 DOMCOOP Degree of domestic inter-firm technology cooperation	+	+/-	+/-	-
X4 CLUSTER Affiliates operating in competitive Swedish clusters	+	+/-	-	+
X5 SPECIAL Specialized affiliates.	+	+	-	-
X6 ENTRY Mode of entry	+	-	-	-
X7 AGE Age of affiliate.	+/-	+	+	+
X8 SIZE Size of affiliates	+	-	-	-
X9 HOMEBASE Home country of affiliates	+	+	+/-	+/-

in industries based on domestic natural resources. In terms of intra-firm exports, theoretical statements on the extent to which this should be organized as intra-firm or arm's-length trade is more difficult to present. Although many affiliates in raw-material based industries, in developing countries, are vertically integrated and export largely on an intra-firm basis, in the analysis above it was found that only a marginal proportion of MOFAs' total sales consists of intermediate input goods aimed at further processing by other part of parent-corporations. Therefore, it is possible that MOFAs operating in industries based on domestic raw-materials and which manufacture finished products, may control their own sales organisation. Thus, an arbitrary relationship between affiliates operating in raw material based industries and intra-firm exports is presumed. In terms of intra-firm purchases of material inputs, this is most likely to be negatively correlated with affiliates operating in industries based on domestically located raw materials, since a substantial amount of inputs are likely to be purchased in the host market. In terms of intra-corporate technological cooperation, again, it is difficult to suggest how this should be correlated with affiliates operating in industries based on domestically located raw materials. An arbitrary correlation, between intra-firm technological cooperation and affiliates operating in industries based on domestic raw materials is hypothesised

Domestic purchases of inputs (x_2). Today, many of the locational competitive advantages of individual countries or regions are not based on indigenous natural resources. Rather, of increasing importance for individual firms to manufacture top-quality products is a range of competencies and skills held by local suppliers. These competencies and skills may be utilized by procurement of industrial input goods. It is,

however, difficult to hypothesize how domestic purchases are connected to exports, as well as with intra-firm exports. Hence an arbitrary correlation between domestic purchases and exports, as well as with intra-firm exports, is suspected. In terms of intra-firm imports and intra-corporate technological cooperation, it is believed that both are negatively correlated with domestic purchases of material inputs.

Domestic inter-firm technological cooperation (x_3). Of course, the importance of capabilities held by domestically located suppliers and customers may not always be reflected in the proportion of material inputs that are purchased from suppliers in the host country. More generally, affiliates may draw on host-market capabilities, in terms of extensive technology cooperation with domestic suppliers and/or customers, without necessarily purchasing a large proportion in the host market. Whether affiliates, engaged in domestic inter-firm technological cooperation, are more likely to export, and to what extent this is organized on an intra-firm basis, is more difficult to hypothesize. Thus, an arbitrary relationship is expected between inter-firm technological cooperation and exports, as well as between inter-firm technological cooperation and intra-firm exports. As regards the correlation between intra-corporate technological cooperation and the extent that affiliates are engaged in technological cooperation with suppliers and customers in Sweden, it may seem likely to suspect a negative correlation, since these affiliates may be less dependent on parent and sister affiliates for generating technological competencies. On the other hand, it is possible that affiliates, engaged in extensive technological cooperation with domestic firms are also involved in a high degree of intra-corporate technological cooperation, in order to diffuse the competencies generated in the industrial network in Sweden, to parent and sister affiliates abroad. We suspect that the latter situation dominates.

Affiliates operating in competitive Swedish industry-clusters (x_4). This variable is intended to measure the correlation between intra-firm integration and MOFAs operating in what have been identified as strong Swedish industry clusters. First, by drawing on the pool of knowledge, capabilities and skills, embodied in firms operating in competitive Swedish clusters, these MOFAs are expected to be more export-intensive, compared to affiliates operating outside the competitive clusters, resulting in a positive correlation between exports and affiliates operating in strong Swedish industry cluster. The correlation between cluster affiliates and intra-firm exports is more difficult to hypothesize. On the one hand, it may be likely that the parent-corporations' sales organisation is used for exports. On the other hand, cluster affiliates may control their own sales organisation. Thus, an arbitrary correlation between intra-firm exports and cluster affiliates is suspected. In terms of intra-firm imports of inputs, this is believed to be negatively correlated with cluster affiliates which may be more involved in purchases from external suppliers, especially in Sweden. The relationship between cluster affiliates and intra-corporate technological cooperation is also difficult to hypothesize. On the one hand, cluster affiliates are believed to be relatively more engaged in technological cooperation with domestic firms. At the same time, these affiliates may also be engaged in technological

cooperation with other parts of the parent corporation in order to diffuse the competencies generated in the industrial network in Sweden. Parallel to what was discussed above concerning the relationship between intra-corporate technological cooperation and technological cooperation with domestic firms, a positive correlation between intra-firm technological cooperation and cluster affiliates is suspected.

The second group of variables take into account some characteristics of individual affiliates likely to affect the extent of integrated production.

Specialized affiliates (x_5). The extent in which the affiliates' production is specialised, compared to the parent firm, is a factor which may significantly affect the degree of exports. Affiliates which are the only, or major, producers of a certain product of the parent corporation, can be expected to be more export intensive, compared to affiliates responsible for only a fraction of the total corporate production of a specific product. Horizontally integrated affiliates, normally only responsible for manufacturing a smaller part of the parent-corporations' total production of a certain product, are most likely to be host-market oriented, constituting a miniature replica of the parent firm. Thus, it seems plausible to expect a positive correlation between exports and specialised affiliates. Again, it is difficult to hypothesize how the degree of specialisation is correlated with intra-firm exports. If the affiliates are vertically integrated, producing intermediate input goods aimed at further processing by other parts of the parent corporation, a positive correlation with specialised affiliate and intra-firm exports is most likely. However, from the empirical analysis above, it was found that only a fraction of MOFAs' manufactured output consisted of intermediate input goods delivered to other parts of parent corporation. Instead, almost all of manufactured products consisted of finished products, where the final customer was an independent firm. In this situation, it is possible that specialized affiliates control their own sales organisation, especially since most affiliates are acquired and many were probably exporting their products prior to the takeover. The benefits of using parent-corporations' sales organisation may, however, result in a positive correlation between specialised affiliates and intra-firm exports. In terms of intra-firm imports and intra-firm technological cooperation, this might be negatively correlated with specialised affiliates since the technological base of these affiliates' may be different from other parts of parent-corporations.

Mode of entry (x_6). Acquired firms are often found to be less integrated by parent-corporations compared to green-field investments. This is partly because acquired firms normally have established their own supplier and customer relationships, prior to the incorporation into the investing firm. In fact, one of the main reasons why the affiliate was acquired in the first place can be related to the investing firm's strategy to tap into a foreign cluster of innovative firms, demanding customers or specialised suppliers. Most dependent variables measuring integrated international production are believed to be negatively correlated with acquisition as a mode of entry. However, this may not be true for exports. On the contrary, the capability to export may have been one of the major reasons why the affiliate was acquired in the first place. A positive correlation between exports and acquired affiliates is thus suspected, while

the other dependent variables are believed to be negatively correlated to acquisitions.

Age of affiliate. (x_7). The increasing importance of FDI, related to acquisition of strategical assets, including market assets, may be reflected in the fact that, more recently incorporated affiliates, to a greater extent, might have been acquired because of their capacity to export, compared to affiliates incorporated earlier. On the other hand, other studies on MOFAs in Sweden have found that exporting affiliates are often found among older affiliates established in the pre-war, or inter-war, period. An ambiguous relationship between age and exports is expected. At the same time, it seem reasonable to suspect that older affiliates are more integrated by parent-corporations, compared to younger affiliates, since it normally takes time to integrate affiliate's operations to that of parent and sister-firms. Thus, a positive correlation between the age and intra-firm exports, intra-firm imports and technological cooperation is suspected.

Size of affiliate. (x_8). This variable takes into account the fact that the export propensity of affiliates can often be correlated with the scale of operation. Furthermore, especially in small host markets, like the Swedish, a positive correlation between the scale of production and exports can be expected. Generally, it also seems plausible to suggest a negative correlation between larger affiliates and intra-firm exports, intra-firm imports and technological cooperation since larger affiliates may control a larger set of management, technological and marketing resources, compared to smaller affiliates.

Home-base of affiliate (x_9). In many industries, US and Japanese affiliates are often found to be market leading, operating a number of large and rationalized affiliates. Since most of the non-European affiliates in Sweden originate in the US, a positive correlation between non-European affiliates and exports as well as intra-firm export is expected. Generally US TNCs have a longer experience of operating foreign located affiliates, compared to European TNCs. At the same time, it may also be reasonable to suspect that it is more difficult to control and integrate the operations of affiliates in Sweden with those of parent-corporations located at a distance from the US, compared to TNCs from Europe. Thus, an arbitrary correlation is expected between non-European TNCs and intra-firm imports and technological cooperation.

11.3 The model

The model which is used in the analysis of integrated international production is a general linear model specified as:

$$Y = \partial + ß_1 X_1 + ß_2 X_2 + ...$$

where Y is the dependent variable measuring the extent of integrated production. ∂ is a constant (intercept), ß is the regression coefficient and X is the independent

variable. This model, given that it is reasonably specified, makes it possible to analyse two things. Firstly, an estimate is generated which shows how much of the variation in integrated production, measured by the dependent variable, statistically can be explained by the combined effect of all independent variables. Secondly, it is also possible to identify the importance of each independent variable affecting the dependent variable, while holding the others independent variables constant.

Since we deal with a multiple regression model, normally the problem of multicollinarity arises due to the fact that, two or more of the independent variables are correlated with each other. This may result in that the explanatory power of independent variables which are correlated, being basically placed on the independent variable showing the highest level of significance, while underestimating or neglecting the others. Owing to this, it is possible that an independent variable which is not found to be significant when explaining the variation in Y, still has a substantial indirect impact on the dependent variable. Although statistical methods exist for minimizing these problems (Johnsson 1992), multicollinarity is not believed to be a major problem in the present analysis since only a moderate or low degree of correlation exists between the independent variables, see Table 11.3.

Table 11.3 *Pearson correlation matrix of independent variables included in the study of MOFAs located in Sweden 1993*

	RAWMTRL	*DOMPUR*	*DOMCOOP*	*SPECIAL*	*ENTRY*	*AGE*	*SIZE*	*HOMEBASE*
RAWMTRL	1.000							
DOMPUR	0.084	1.000						
DOMCOOP	-0.032	0.004	1.000					
SPECIAL	0.066	0.236	0.062	1.000				
ENTRY	0.020	0.165	0.146	0.116	1.000			
AGE	-0.130	-0.207	-0.061	-0.101	-0.518	1.000		
SIZE	-0.001	0.009	0.129	0.049	0.175	-0.036	1.000	
HOMEBASE	-0.108	0.118	0.085	-0.025	0.048	-0.053	0.106	1.000

Source: Survey data by the author

11.4 Results

The result of the regression analysis is shown in Table 11.4 and Table 11.5. In these tables the R^2-value shows the percentages of the total variation in the dependent variable which, statistically, can be explained by the model. The P-value shows the statistical significance of each independent variable's affect on the dependent variable, while holding the other independent variables constant. The figures indicating the P-value show the likelihood that the estimated figures are randomly produced. The regression coefficient shows the relative strength of each independent variable affecting the dependent variable, while holding the other constant. The regression coefficient also shows the direction, positive or negative, of this influence.

Table 11.4 *Result of the regression analysis of exports and extra-Nordic exports of MOFAs*

located in Sweden 1993

Variable	Y_1 EXPORT Expected sign	P-value (2-tail)	Regression coefficient	Std error	Y_2 EXTRA-NORDIC EXPORT Expected sign	P-value (2-tail)	Regression coefficient	Std error
INTERCEPT		0.002	23.967	7.828		0.512	4.904	7.464
X1 RAWMTL	+	0.309	6.000	5.888	+	0.454	4.205	5.608
X2 DOMPUR	+/-	0.286	-0.064	0.060	+/-	0.495	-0.039	0.057
X3 DOMCOOP	+/-	0.636	-1.766	3.728	+/-	0.898	0.454	3.553
X4 CLUSTER	+	0.239	4.588	3.892	+	0.146	5.401	3.709
X5 SPECIAL	+	0.000***	0.251	0.047	+	0.000***	0.279	0.044
X6 ENTRY	+	0.412	5.362	6.527	+	0.247	7.226	6.223
X7 AGE	-	0.167	-0.216	0.156	-	0.211	-0.188	0.150
X8 SIZE	+	0.011**	0.039	0.015	+	0.003***	0.044	0.015
X9 HOMEBASE	+	0.008***	15.199	5.695	+	0.009***	14.228	5.423
			$R^2 = 0.174$ N = 288				$R^2 = 0.217$ N = 288	

*** Significant at the 0.1% level ** Significant at the 1% level *Significant at the 5% level

Source: Survey data by the author

The result of the regression analysis of MOFAs' exports and extra-Nordic exports, presented in Table 11.4, show that around 20 percent of the total variation of exports as well as extra-Nordic exports can statistically be explained by the models. We can notice that except for those two variables where an ambigious correlation was hypothesized, all signs of the regression coefficients on exports and extra-Nordic exports are the same as those expected, although not all were found to be statistically significant. It can be seen that three variables are statistically significant and positively correlated to the extent in which MOFAs export from Sweden. First, the extent in which affiliates' production is specialized in relation to sister and parent-firms seem to be positively correlated with exports from Sweden. Secondly non-European MOFAs, which in principle means affiliates of US TNCs, are also found to be correlated with manufactured export. Thirdly, the size of the affiliates seems also to be positively correlated with the extent of exports, meaning that larger affiliates tend to be more export orientated, compared to smaller affiliates.

Furthermore, we find that the same three variables which are significantly correlated with exports are also significantly correlated with extra-Nordic exports. The only difference between this model and the previous, is that the size-variable is found to be more significantly, and positively correlated with extra-Nordic exports compared to exports in general. This suggests that extra-nordic exports are to a large extent correlated with larger affiliates.

Of the other variables determining the export intensity, none is found to be significant below the 5 percent level, meaning that these results are randomly

produced to a higher degree.

In Table 11.5, the result of the regression analysis of intra-firm exports intra-firm imports and intra-corporate technological cooperation is presented. Firstly, the total statistical explanation of variations in each of these three dependent variables show R2 -values of 0.102 for intra-firm exports, 0.138 for intra-firm imports and 0.174 for intra-corporate technological cooperation. Of the variables included in the analysis, three are significantly correlated with intra-firm exports. First, a strong (significant at the 0.1% level), and negative, correlation exists between intra-firm exports and affiliates operating in strong Swedish industry clusters suggesting that these firms to a large extent control their own sales organisation. Furthermore, we also find a statistically significant (at the 5% level) and negative correlation between intra-firm exports and MOFAs operating in industries based on domestic raw materials. Thirdly, intra-firm exports also seem to be negatively correlated with the extent that affiliates are engaged in technological cooperation with suppliers and customers in Sweden.

In the regression analysis of intra-firm imports, this seems to be strongly (significant at the 0.1% level) and negatively correlated with two variables: the extent that affiliates are purchasing material inputs from suppliers in Sweden and the extent that affiliates production is specialised in relation to other parts of the parent-corporations.

The last dependent variable, measuring the extent of integrated production relates to intra-corporate technological cooperation. Here, it is found that the same two variables which were found to be negatively correlated to intra-firm imports, i.e. intra-firm purchasing and specialised affiliates, were also found to be strongly (significant at the 0.1% level), and negatively, correlated to intra-firm technological cooperation.

Finally, if we focus on those variables which were significantly correlated with intra-firm trade and technological cooperation, all, except where an ambigious correlation was hypothesized, showed the same sign as was expected. However, if we focus on those variables which exhibit no, or weak, correlation (above 5% level) with intra-firm trade and technological cooperation, some show the opposite sign compared to what was expected.

11.5. Summary

This chapter has applied a multiple regression analysis in order to substantiate the empirical findings as to what extent variations in integrated international production may be affected by different types of affiliates, presented in chapters 6-9, above. The statistical analysis is focused on four aspects of integrated international production: the extent of MOFAs' exports, intra-firm exports of manufactured output (consisting almost exclusively of finished products), intra-firm imports of material inputs, and the degree of intra-corporate technological cooperation. Nine independent variables that are likely to affect the extent of integrated international production between MOFAs and other parts of parent corporations, are included in the analysis. Four of these

Table 11.5 *Result of the regression analysis of intra-firm exports, intra-firm imports and intra-corportae technological cooperation in MOFAs located in Sweden 1993*

	Y_3 INTRA-FIRM EXPORTS				Y_4 INTRA-FIRM IMPORTS				Y_5 INTRA-CORPORATE TECHNOLOGICAL COOPERATION			
Variable	Expected sign	P-value (2-tail)	Regression cofficient	Std error	Expected sign	P-value (2-tail)	Regression cofficient	Std error	Expected sign	P-value (2-tail)	Regression cofficient	Std error
INTERCEPT		0.000	39.588	8.934		0.000	47.831	7.885		0.000	0.995	0.111
X_1 RAWMTL	+/-	0.031*	-14.565	6.720	-	0.331	-5.775	5.930	+/-	0.944	-0.006	0.084
X_2 DOMPUR	+/-	0.263	0.077	0.068	-	0.000***	-0.225	0.060	-	0.000***	-0.003	0.001
X_3 DOMCOOP	+/-	0.035*	-9.019	4.255	+/-	0.398	-3.181	3.755	-	0.572	0.030	0.053
X_4 CLUSTER	+/-	0.005***	-12.518	4.441	-	0.756	1.218	3.920	+	0.710	0.021	0.055
X_5 SPECIAL	+	0.676	0.022	0.053	-	0.001***	-0.154	0.047	-	0.000***	-0.003	0.001
X_6 ENTRY	-	0.921	0.739	7.449	-	0.451	-4.959	6.574	-	0.252	-0.106	0.093
X_7 AGE	+	0.608	-0.091	0.178	+	0.644	0.073	0.157	+	0.665	0.001	0.002
X_8 SIZE	-	0.146	0.026	0.018	-	0.253	-0.018	0.016	-	0.296	≈0.00	0.000
X_9 HOMEBASE	+	0.087	11.157	6.499	+/-	0.839	1.170	5.736	+/-	0.837	0.017	0.081
		R^2 = 0.102 N = 288				R^2 = 0.138 N = 288				R^2 = 0.174 N = 288		

*** Significant at the 0.1% level ** Significant at the 1% level *Significant at the 5% level

Source: Survey data by the author

variables capture geographical, or locational-specific advantages in the host country, while the other five capture affiliate-specific attributes.

The analysis showed that, in terms of exports, there exists a statistically significant and positive relationship between MOFAs' exports and the extent in which MOFAs' production is specialized in relation to sister and parent-firms located abroad. Secondly, non-European MOFAs, which in principle consist of affiliates of US TNCs, were also found to be significantly correlated with manufactured exports. Thirdly, the size of the affiliates seems also to be positively correlated with the extent of exports, meaning that larger affiliates tend to be more export-orientated than smaller affiliates. The tendency for these three variables to be positively correlated with exports was found both in relation to total exports from Sweden, as well as in relation to exports outside the Nordic market. This means that the result is not caused by there being many firms only engaged in exports to the adjacent Nordic market.

Three variables were found to be significantly, and negatively, correlated with intra-firm exports. Since MOFAs intra-firm exports exclusively consist of finished products, aimed at external customers, this variable relates to finished products, *per se,* rather than to intra-firm exports in general. Firstly, a negative correlation existed between intra-firm exports and affiliates operating in strong Swedish industry clusters. Secondly, we also found a negative correlation between intra-firm exports and MOFAs operating in industries based on domestic raw materials. Thirdly, intra-firm exports also seem to be negatively correlated with the extent that affiliates are engaged in technological cooperation with suppliers and customers in Sweden. This suggests that these three types of affiliates, to a large extent, control their own sales organisation abroad.

In the regression analysis of both intra-firm imports of material inputs, and intra-corporate technological cooperation, there was found to be a significant, and negative, correlation with two variables: the extent that affiliates are purchasing material inputs from suppliers in Sweden and the extent that affiliates' production is specialised in relation to other parts of parent-corporations. This suggests that affiliates purchasing large shares of material inputs in Sweden and affiliates responsible for producing most, or all, of a certain product of the parent corporation, are involved in relatively little intra-firm imports of material inputs and intra-corporate technological cooperation.

12 CONCLUSION AND DISCUSSION OF FINDINGS OF THE STUDY

12.1 Objectives of the study

The present study is an attempt to contribute to an understanding of the emerging pattern of international specialization among TNCs, by offering an empirical survey of integrated international production in majority owned foreign affiliates (MOFAs) located in Sweden in 1993. The first, general, objective of the study has been:

> to describe the extent of integrated international production, i.e. transactions between MOFAs located in Sweden and their parent- and sister-firms located outside Sweden.

Three broad aspects of integrated international production are focused upon. First, the extent in which MOFAs are involved in export activities, alternatively produce for the local market in Sweden. Second, the extent that MOFAs are involved in intra-firm sales of manufactured products, respectively, intra-firm purchases of material inputs. Third, the extent that MOFAs integrate other parts of their value-chains with parent and sister firms outside Sweden.

Some new trends in FDI have been identified as likely to affect the tendency towards increasing integration between TNC-units. In order to analyse the possible existence of any systematic differences in integrated international production between different types of affiliates, four categories of affiliates have been considered. The degree of integrated international production was suspected to vary according to: a) the mode of entry of affiliates, b) the absolute size of affiliates, c) the international strategy applied by the affiliate, and d) the Swedish industry clusters in which the affiliates operate. Since most of these four categories of affiliates are analytical concepts, not easy to observe empirically, we first had to identify the different categories of affiliates. Therefore, a second objective of the study has been:

> to identify variations in: a) the mode of entry of affiliates, b) the absolute size of affiliates, c) the applied international strategy of the affiliates, and, d) the Swedish industry clusters in which the affiliates operate.

After the different categories of affiliates had been identified, it was possible to analyse possible systematic variations between the identified categories in terms of integrated international production. Hence, the third objective of the study has been:

> to analyse the existence of any systematic variations in the extent of integrated international production between affiliates according to a) the mode of entry of affiliates, b) the absolute size of affiliates, c) the applied international strategy of the affiliates, and, d) the Swedish industry clusters in which the affiliates operate.

12.2 Main contribution of the study

12.2.1 Empirical findings

The first objective of the study has been to empirically analyse the extent of integrated international production, i.e. transactions between MOFAs and their parent and sister affiliates located outside Sweden. Seven research questions were put up in order to discuss this objective. The research questions and the main empirical findings related to each of them, may be summarized as follows.

i) To what extent are MOFAs' products sold on the Swedish host market, alternatively, exported to different foreign markets, distinguishing between manufactured products and resale?

It was found that half of MOFAs are engaged in resale activities, accounting for 13 percent of their total turnover. Main resale markets were Sweden with 83 percent of total resale, while the adjacent Nordic market accounted for 8 percent.

Concerning MOFAs' manufactured products, 47 percent were sold in the Swedish host market, while 25 percent were sold in Western Europe, 15 percent in Non-European markets, and 11 percent in the adjacent Nordic market.

As many as 90 percent of all MOFAs had at least some manufactured exports, and 40 percent exported most of their output.

ii) To what extent are MOFAs integrated with other parts of the parent corporation through intra-firm sales of manufactured products, distinguishing between intermediate input-goods aimed at further processing by sister- or parent- firms, and finished goods aimed at resale to external customers?

It was found that 40 percent of MOFAs manufactured exports were intra-firm, representing 25 percent of their total sales. In total, 70 percent of exporting MOFAs had at least some intra-firm exports and one third exported most of their products on an intra-firm basis.

Almost all intra-firm exports consisted of finished products, aimed at external customers. Only 1 percent of manufactured sales were input goods, aimed at further processing by parent- or sister- firms outside Sweden.

The main markets for intra-firm exports of material inputs were Western Europe with 42 percent, Nordic countries, excluding Sweden with 37 percent and North America with 15 percent of intra-firm sales of material inputs.

iii) To what extent are MOFA purchasing material inputs from suppliers in Sweden, alternatively importing them from suppliers abroad?

It was found that less than half (45%) of total purchasing of material inputs was from from suppliers in Sweden, while one third was imported from suppliers in Western Europe, 13 percent from the Nordic market, excluding Sweden, and 10 percent from Rest of World.

Almost all MOFAs (95%) imported at least some material inputs, and over one third purchased most of their inputs from suppliers abroad.

iv) To what extent are MOFAs vertically integrated with parent- and sister-firms through intra-firm purchases of material inputs?

It was found that intra-firm deliveries from parent- and sister-affiliates were responsible for around 30 percent of all imports of material inputs, corresponding to 18 percent of all purchases of material inputs. Almost half of MOFAs (48%) had, at least some intra-firm imports of material inputs, while 22 percent imported their inputs mainly on an intra-firm basis.

Intra-firm deliveries of material inputs originated mainly from parent and sister affiliates located in Western Europe, with 44 percent of total intra-firm purchases of material inputs, and the Nordic countries, except Sweden with 38 percent. Intra-firm purchases from Sweden accounted for 11 percent and North America for 5 percent of total intra-firm purchases of inputs.

v) To what extent are the different functional activities of MOFAs coordinated with parent- and sister-firms?

In terms of intra-corporate coordination of different functional activities it was found that the R&D and finance functions were coordinated in over 60 percent of MOFAs, while the marketing function was coordinated in 40 percent, and the sales, procurement and administration functions in 30 percent of MOFAs. Quality control, manufacturing, distribution and after-sale services were coordinated in only 7-16 percent of MOFAs.

vi) To what extent are MOFAs involved in cooperation with parent- and sister-firms, alternatively, external firms (e.g. suppliers and customers) in order to generate technological competence?

Here it was found that 40 percent of MOFAs claimed that they were extensively engaged in technological cooperation with corporate firms abroad, while 18 percent

indicated that they cooperated extensively with external firms in Sweden and 9 percent with external firms abroad.

At the same time, over 70 percent of MOFAs claimed that their technological competence was mainly developed internally by themselves, while one fifth of MOFAs indicated that parent- and sister-firms abroad were the main source for development of technological competence. In a few affiliates (5%), external firms in Sweden were believed to be the main technology development source.

Looking to the relatively most important partner when developing technological competence, over half of MOFAs (54%), indicated that parent-and sister-firms abroad were their main partner, while 27 percent claimed external firms in Sweden as being most important. A few MOFAs (around 5%), claimed corporate firms in Sweden, respectively, external firms abroad, as most important.

vii) To what extent do MOFAs operate as competence centres, indicated by their having corporate responsibilities in different functional areas, on behalf of parent- and sister-firms?

Almost one quarter of MOFAs (23%), indicated that they operated as competence centres, with corporate responsibility in at least one functional area on behalf of at least one sister or parent firm.

Most MOFAs (6-7%) operated as competence centres in R&D, marketing and sales, while very few competence centres were found in quality control, procurement and distribution. In three quarters of the competence centres this included operations outside the Nordic countries, while in one quarter it only included the Nordic operations.

These general findings of integration between TNC-units were analysed in relation to some new trends in FDI, which might have an impact on the extent in which the production of TNCs tend to be integrated. Firstly, the extent of integrated international production was suspected to vary depending on the mode of entry of affiliates. The traditional form of FDI, i.e. the set-up of new businesses through green-field investments in order to capture new, or to protect existing markets, is, at least in developed countries, giving way to the practice of acquiring competitors, suppliers or other firms, controlling what is perceived to be assets complementary to those held by the investing firm. As acquired firms normally have their own technological and organisational structure, and at the same time have established business relationships with suppliers and customers, they might be more difficult to integrate, compared to affiliates started by means of green-field investments.

Secondly, the extent of international integration was suspected to vary according to the size of individual affiliates. Traditionally, foreign affiliates have often been relatively small, and, to a large extent, dependent on parent-firms for much of their operations. Today, many foreign-located affiliates are large entities, controlling not

only manufacturing operations, but also a host of other activities, including marketing and R&D. In part, this is a result of the growth of many foreign located affiliates during the years, while others have been acquired more recently. As a result, these large affiliates may be able to operate quite independently from parent firms, compared to smaller affiliates.

Thirdly, the extent in which integrated production is affected by the capability and willingness of TNCs, or their affiliates, to implement different international strategies when operating in different markets. Even if industry-or country-specific factors put a premium on a rationalized strategy with extensive integration of large scale operations, the capability and willingness of individual TNCs to implement different international strategies will critically affect the degree of integration.

Fourthly, the likelihood that integrated international production varies between affiliates operating in different Swedish industry clusters has been analysed. Today many TNCs invest in countries or regions in order to capture specific skills and competencies held by suppliers, customers or other firms located in a specific country or region. These competencies are often generated in close relationship with other firms located in this specific region or nation, meaning that they are largely location-specific and difficult to transfer to other places, even if they are embodied in a majority-owned affiliate. Hence, depending on whether the foreign-located affiliate operates in an industry where the host country has generated an international competitiveness, based on a cluster of interrelated firms and institutions, this might also affect the extent in which the affiliates are integrated into parent corporations activities.

The findings related to the second objective of the study, i.e to identify variations in the mode of entry of affiliates, the absolute size of affiliates, the applied international strategy of the affiliates, and finally, the Swedish industry clusters in which the affiliates operate, showed that, out of the 296 investigated MOFAs located in Sweden in 1993:

-As many as 87 percent were acquired, while 13 percent were green-field investments.

-Half of MOFAs were identified as large affiliates, employing at least 100 persons, while half were identified as small affiliates, employing less than 100 persons.

-In terms of international strategy, 28 percent were found to operate as miniature replicas, (restricted to host country production), 23 percent as rationalized manufacturers, (specialized to produce one or a few products for exports), and 47 percent operated as strategic independents (no restrictions of geographical markets or products).

-In terms of industry cluster, over half of MOFAs (56%) operated in internationally competitive Swedish industry clusters, while 44% were related to other industries.

After these different types of MOFAs had been identified, the third objective of the study was to analyse the existence of any systematic variations in the extent of integrated international production between affiliates according to a) the mode of entry, b) the absolute size, c) the applied international strategy, and, d) the Swedish industry clusters in which the affiliates operate. The possible variations in internationally integrated production were captured by comparing the different categories of affiliates using the seven research questions, presented above.

Of course it is difficult to summarize the various indications of integrated production, and how this tends to vary according to the different types of affiliates. Nevertheless, in Table 12.1 an attempt is made to give a summary of the most important findings on variations in integrated international production according to mode of entry, size, international strategies and industry clusters.

Table 12.1. Types of MOFAs located in Sweden 1993 mostly involved in integrated international production.

Type of integration	Mode of entry	Size of affiliate	International strategy	Industry cluster
Exports	Acquisitions	Large affiliates	Rationalized manufacturers	Cluster MOFAs
Intra-firm exports	Marginal difference	Large affiliates	Rationalized manufacturers	Non-cluster MOFAs
Imports	Green-field affiliates	Small affiliates	Rationalized manufacturers	Marginal difference
Intra-firm imports	Green-field affiliates	Small affiliates	Rationalized manufacturers	Marginal difference
Coordination of functional activities	Green-field (up-stream) Acquisitions (down-stream)	Large affiliates	Miniature replicas	Non-cluster MOFAs
Intra-corporate technological cooperation	Green-field affiliates	Large affiliates	Miniature replicas	Marginal difference
Indications of competence centres	Marginal difference	Large affiliates	Rationalized manufacturers/ Strategic independents	Non-cluster MOFAs

Source: Survey data by the author

Firstly, the findings related to exports by MOFAs suggest that there are variations between different types of MOFAs. Exporting affiliates were above all associated with acquired affiliates, large affiliates and with affiliates operating as rationalized manufacturers. A somewhat higher export-intensity was also found in cluster affiliates, compared to non-cluster affiliates.

Intra-firm exports were found to be especially high in large affiliates, in affiliates

operating as rationalized manufacturers, and in non-cluster affiliates. Only small differences were found between green-field and acquired affiliates.

The findings on imports of material inputs showed that these were especially high in green-field affiliates, small affiliates, and rationalized manufacturers, while only marginal difference was found between cluster and non-cluster affiliates.

In terms of intra-firm imports, this was found to be highest in green-field affiliates, rationalized manufacturers, and smaller affiliates, while only small differences were found between cluster and non-cluster affiliates.

The findings on coordination of various functional activities, showed that generally, this was most frequent in the larger affiliates and in miniature replicas. No clear differences in terms of coordination could be found between green-field and acquired affiliates. Instead, a larger share of green-field affiliates tend to coordinate their up-stream activities, e.g. R&D, procurement and manufacturing, while a larger share of acquired affiliates coordinate their down-stream activities, e.g. marketing, sales and distribution. Finally, coordination were also relatively more found in non-cluster affiliates.

Affiliates which extensively cooperated with parent- and sister-firms in order to generate technological competence were, above all, found among green-field affiliates, large affiliates and miniature replicas, while only smaller differences were found between cluster and non-cluster affiliates.

Finally, the findings on affiliates operating as competence centres showed that this was above all related to large affiliates, and to a less degree, also to non-cluster affiliates. The findings also showed that rationalized manufacturers and strategic independents tended to operate as competence centres to the same extent. Only marginal differences were found as regards the mode of entry.

To give an overall account of how the extent of integrated international production is likely to be affected by variations in the mode of entry, size, international strategy and industry clusters of MOFAs is, naturally, problematic, since it is difficult to identify any type of MOFAs with a high degree of integration in all the analysed dimensions. However, from the table above it seems that, according to the mode of entry, green-field investment affiliates were more integrated compared to acquired affiliates. As regards the size of affiliates, the larger affiliates seem generally to be more integrated compared to the smaller. Looking at affiliates operating with differentiated international strategies, the rationalized manufacturers tend to be relatively most integrated in most of the analysed dimensions. Finally, in terms of affiliates operating in different Swedish industry clusters, the tendency is less clear, although non-cluster affiliates seem to be engaged in integrated international production to a somewhat larger extent.

The regression model, applied in chapter 11, generated some significant correlations between different types of MOFAs and integrated international production. Firstly, it was found that exports were positively correlated with large affiliates and with specialized affiliates, i.e affiliates responsible for producing all or most of a certain product of the parent corporation. This suggests that exports are also positively

correlated with rationalized manufacturers or strategic independents, while negatively correlated with miniature replicas. The regression analysis also showed that intra-firm exports were correlated with non-cluster affiliates. A negative correlation between specialized affiliates and intra-firm imports was also found, which seems to be contrary to what was suggested in table 12.1, above, showing that rationalized manufacturers were highly involved in intra-firm imports. However, this is probably due to the fact that a large number of strategic independent affiliates, which, on average, are least dependent on intra-firm imports, are included among the specialised affiliates. Finally, the regression analysis also showed that the extent in which MOFAs were involved in cooperation with parent- and sister-affiliates in order to develop technological competence, was negatively associated with specialised affiliates, suggesting that horizontally integrated affiliates, i.e miniature replicas, are most involved in intra-corporate technological cooperation.

In summary, the empirical findings of the present study are believed to make a valuable contribution to the understanding of the operations of foreign-located affiliates. Based on unique data, collected at the firm level of 296 majority-owned foreign affiliates in manufacturing, located in Sweden in 1993, the empirical findings of the study provide a reference for comparative studies, both in terms of longitudinal analysis of changes in integrated international production among foreign affiliates located in Sweden through time, as well as inter-country comparisons in integrated international production between affiliates located in different countries. By providing detailed information about exports, imports, intra-firm trade and integration of various parts of the value-chain, the study is believed to contribute to a better understanding of the organisation of integrated international production among TNCs and their foreign affiliates.

Empirical findings on integrated international production in terms of MOFAs' export-intensities, import-intensities as well as the importance of intra-firm trade are not, in themselves, believed to be unique, although, as will be discussed in greater detail below, the methodology applied to measure these variables is probably more reliable, compared to many other studies on the subject. The detailed information on various sales and purchasing markets, including those of intra-firm trade, is probably not found in many other comparable studies.

The findings on the extent of intra-corporate coordination of different functional activities, cooperation with corporate firms and external firms in order to generate technological competence, as well as the findings related to foreign affiliates operating as competence centres, are believed to be a valuable complement to the small pool of findings of the subject. In addition to most other studies, the present study not only identifies these phenomenon, but also gives an account of their relative importance.

The findings related to variations in integrated international production between the four different types of affiliates are also believed to have a general interest, especially the analysis showing the extent in which MOFAs operate with

differentiated international strategies, and the findings showing the extent in which MOFAs operate in various industry clusters. Since the analysis of MOFAs operating in different industry-clusters probably are one of the first to have been undertaken based on firm level data, it is believed to make a valuable contribution to the understanding of industry-clusters as a pull factor attracting foreign investments.

12.2.2 Findings with implications for established TNC-theory

12.2.2.1 Integrated international production in different types of MOFAs

Beside an in-depth presentation of empirical findings, facilitating comparisons with other studies on integrated international production, some of the results also believed to have a wider interest, with implications for established TNC-theory. The analysis of integrated international production between different types of MOFAs suggests, firstly, that the dominant trend in recent decades of expanding abroad by means of acquisitions of existing companies, might result in a relative stagnation in terms of integration between different TNC units, since acquired affiliates, generally, tend to be less integrated compared to green-field investments. On the other hand, the tendency for many foreign located affiliates to have become large during the years, may lead to increased integration between affiliates and parent firms, since, contrary to what could be expected, larger affiliates seem to be more integrated with other parts of parent corporations, than smaller affiliates. Another factor which may lead to continued integration between TNC-units is related to the fact that, today, many affiliates are involved in cross-border product or process specialisation, characterized by rationalized production of one or a few products, aimed at the international market. Since these types of affiliates were found to be among the most integrated, a continued strategy among TNCs to rationalize their production in order to receive economies of scale, may also lead to more integration between various parts of the TNC-system. Finally, the recently observed tendency of many TNCs to complement their competitive advantages by investing in competitive industry clusters in various host-countries, may in the long run lead to an increased integration between different parts of the TNC. However, the results from the present study showed no clear tendency towards more integration between affiliates operating in competitive Swedish industry clusters and the rest of the parent corporations, compared to affiliates operating in other industries. Instead, the findings suggested that the latter type of affiliates tend to be somewhat more integrated in most analysed dimensions.

12.2.2.2 Exports

In addition to these findings on integrated international production, other results of the study are believed to have a wider interest, with implications for established TNC

theory. Firstly, in terms of exports, MOFAs in Sweden were found to be relatively more export-orientated than Japanese, US and Swedish affiliates located in the EU, as well as foreign affiliates located in France and Finland, for which comparable data are available. As has also been suggested for foreign-located affiliates in general, the export intensity of MOFAs in Sweden has increased, at least since the 1960s. Furthermore, the findings on MOFAs located in Sweden confirm the view that foreign affiliates tend to be more export-orientated than domestic firms in general, and that this can mainly be explained by the fact that MOFAs tend to be more export orientated in all, or most, industries, rather than concentrated in export-oriented industries. Moreover, the findings support the general view that MOFAs exports are mainly directed to third country markets, rather than to the home market of the parent company. In addition to what is normally suggested, the findings of the present study indicate that exports by foreign affiliates are not only directed to other countries inside a specific regional trading-area, but, that exporting affiliates also serve adjacent trading areas, and extra-continental markets.

The findings related to exports among different types of affiliates support the perspective that green-field investments are generally host-market orientated, while acquired affiliates are export-oriented to a larger extent. These findings on exports by MOFAs located in Sweden in 1993, also confirm findings from the 1960s, which showed that exports from Sweden were mainly performed by acquired affiliates, rather than by green-field affiliates. The findings also gave empirical support to established theory suggesting that exports by foreign affiliates are associated with large affiliates, which, empirically, have been found among foreign affiliates of Swedish and US TNCs. In addition, these findings also confirm findings from the 1960s, which showed that exports from Sweden were mainly performed by large, rather than small, affiliates. Furthermore, the findings give support to other studies showing that the highest propensities among affiliates to engage in exports are found in TNCs operating strategies of cross-border product or process specialization, which has also empirically been shown for Swedish and US TNCs.

12.2.2.3 Intra-firm exports

In terms of intra-firm exports, measured in relation to total exports, MOFAs in Sweden were found to be less engaged in intra-firm exports than US affiliates located in Europe, but more involved in intra-firm exports compared to foreign affiliates of Swedish TNCs. However measured as intra-firm exports in relation to total sales, MOFAs were found to be involved in intra-firm exports to the same extent as US affiliates located in the EC. Secondly, at a more general level, the findings support the perspective that, recently, intra-firm exports, have generally tended to decrease or stagnate in relation to total exports. Furthermore, the present study also gives support to recent findings suggesting that intra-firm trade is not necessarily associated with

vertical integration in terms of intra-firm exports of material inputs, but also, that finished products, aimed at external customers are sold to a large extent through intra-firm exports. This explains why, contrary to what is suggested by many theories on intra-firm trade, substantial shares of high intra-firm exports can be found in "low tech"-industries, and not only in "high-tech" industries. Finally, in addition to current theory, the findings of the present study suggest that intra-firm exports by foreign affiliates are not only directed to other countries inside a specific regional trading-area, but, that affiliates also serve adjacent trading areas, as well as extra-continental markets with intra-firm exports.

The findings on variations in intra-firm exports between different types of affiliates support the view that high propensities among affiliates to engage in intra-firm exports, are above, all found in TNCs that operate strategies of cross-border product or process specialization. This has also been shown empirically regarding Swedish and US TNCs. The present findings confirm studies of foreign affiliates of Swedish TNCs, which also show that green-field and acquired affiliates use intra-firm exports to the same extent. What might be surprising is that larger affiliates seem to be more dependent than smaller affiliates on intra-firm exports. The findings also showed that cluster affiliates were less involved in intra-firm exports than non-cluster affiliates. Since it is theoretically difficult to argue why this is so, and since no comparable studies are available, these findings are difficult to evaluate.

12.2.2.4 Imports of material inputs

In the present study, the share of total purchases accounted for by domestic purchases and imports has been analysed. Unfortunately, since no comparable up-to date surveys have been found, it has not been possible to compare these findings on import-intensities among MOFAs in Sweden with affiliates located in other countries. However, the findings of the present study give some support to the idea that foreign affiliates, over time, increase their domestic purchases of material inputs, and that imports decrease in relative importance. Also, the findings of the present study gave some support to the idea that foreign affiliates are more import-intensive, compared to domestic firms. This seems to be an effect of foreign affiliates being more import intensive in most industries, rather than being concentrated in import-intensive industries. The findings from the present study also gave some support, albeit weak, to the notion that affiliates that coordinate their purchasing function with parent and sister affiliates are more involved in imports and less involved in domestic purchasing, compared to non-coordinated affiliates.

The findings of variations in imports between different types of MOFAs confirm the idea that green-field affiliates often import a large share of their material inputs. However, contrary to what was suspected, rationalized manufacturers were found to be more import-intensive than miniature replicas.

12.2.2.5 Intra-firm imports

The findings on intra-firm imports of material inputs showed that, compared to foreign affiliates of Swedish TNCs, MOFAs in Sweden were equally involved in intra-firm imports, except for those affiliates operating in the transportation and electronics industries, where the former affiliates are more involved in intra-firm imports of material inputs. More generally, the findings from the present study support the perspective that intra-firm imports, in relation to total imports, have stagnated or decreased in recent years. Contrary to what is normally suggested, the findings of the present study indicate that comparably high shares of intra-firm imports of material inputs can be found not only in industries which normally are characterized as high-tech industries, but also in other industries. Finally, also in addition to what is normally suggested, the findings of the present study suggest that intra-firm imports by foreign affiliates are not only organized inside a specific regional trading-area, but, that affiliates are also supplied through intra-firm imports of material inputs from corporate firms located in adjacent trading areas, as well as in extra-continental regions.

The findings on variations between different type of MOFAs as regards intra-firm imports support the view that green-field investments are often involved in a large amount of intra-firm importing of material inputs. This is also in line with what has been found among foreign affiliates of Swedish TNCs, showing that acquired affiliates, on average, are substantially less dependent on intra-firm imports compared to green-field affiliates. Again, contrary to what could be suspected, rationalized manufacturers rather than miniature replicas were most involved in intra-firm imports.

One of the most interesting findings of the present study, related to intra-firm trade, shows that the distinction between vertically and horizontally integrated affiliates is difficult to make when using detailed firm-level data on intra-firm trade, distinguishing finished products from intermediate input goods. As has been discussed above, in recent analysis of intra-firm trade, it is suggested that not all of this takes the form of vertical integration, where different units are supplied by intermediate input goods. Instead, a more complicated picture seems to emerge, where it is necessary to distinguish between intermediate inputs and finished products since these are partly internalized for different reasons. It is suggested that intra-firm trade of intermediate products for usage in the production process should be associated with vertical integration based on economies of scale and specialization at the plant level and the exploitation of country differences in factor endowments. Intra-firm trade of finished products, on the other hand, should be more associated with horizontally integrated TNCs, operating a number of foreign-located affiliates, producing similar products in different countries in combination with imports of complementary finished products from sister- and parent-affiliates. Thus, vertical integration is suggested as being associated with intra-firm trade in intermediate inputs, while horizontal expansion enhances imports of complementary, finished goods, but may to lead to less trade on the whole. The present findings on affiliates operating with differentiated

international strategies, only partly support this perspective, but rather suggests that the distinction between horizontally and vertically integrated affiliates, in reality, is difficult to make, since many affiliates were characterized by a combination of these two types of integration strategies. For example, horizontally integrated affiliates tend not only to import finished products for resale, but also inputs from parent- and sister-affiliates, which makes the distinction between horizontal and vertical integration less distinct than theory suggests. Furthermore, the type of affiliate which can be said to be most vertically integrated, supplied to the largest extent by inputs from parent- and sister-firms abroad, i.e rationalized manufacturers, are also found to be most export intensive and also most involved in intra-firm exports, consisting almost exclusively of finished products aimed at external customers. Finally, the findings show that intra-firm trade also is found in affiliates not involved in product or market specialisation.

12.2.2.6 Intra-corporate coordination of different functional activities

The analysis of corporate integration of various parts of affiliates' value chain showed, that in terms of coordination, the findings support the perspective that, today, a number of TNCs and their affiliates manage various parts of their functional activities in an integrated fashion. Broadly speaking, the most common activities MOFAs in Sweden coordinate with parent- and sister-affiliates seem to be the same as has been found in other surveys. In addition to this, the present study gave some indications of the share of affiliates which coordinate their functional activities with parent- and sister-affiliates. This showed that most MOFAs still operate their functional activities in an un-coordinated fashion, except for finance and R&D, where a great majority of the affiliates are integrated with parent- and sister firms.

In line with what could be expected, a large number of affiliates operating as miniature replicas indicated that they coordinated their functional activities with parent and sister affiliates. The findings also showed that green-field affiliates were not generally more coordinated, than acquired affiliates. Instead the findings suggest that acquired affiliates coordinate their down-stream activities, to a larger extent, while green field investment affiliates coordinate their up-stream activities. Furthermore, contrary to what could be expected, coordination was also frequently found among larger affiliates. The findings showing that cluster affiliates are less coordinated, compared to non-cluster affiliates, can be interpreted as being in line with what could be suspected, since cluster affiliates probably have closer contacts with suppliers and customers in the host country.

12.2.2.7 Inter-firm and intra-corporate technological cooperation

In terms of generating technological competence, the findings from the present study show that, among MOFAs located in Sweden in 1993, a great majority believe that

parent- and sister-affiliates are of secondary importance when generating their technological competence. Instead, technological competence is mainly developed internally by the affiliates themselves. Moreover, the findings also indicate that parent and sister affiliates are still the most important partners when generating technological competence, although a sizeable share of affiliates generate their technological competence mainly among suppliers and customers in the host country. Thus, this supports other findings showing that many manufacturing TNCs find that linkages with foreign firms are one of their most important sources of competitiveness.

The findings showing that green-field affiliates and miniature replicas were relatively most involved in cooperation with parent and sister affiliates is in line with what can be expected. While the findings suggesting that larger affiliates are frequently involved in cooperation with parent and sister affiliates in order to generate technological competence might be surprising.

In terms of cooperation with external firms in order to generate technological competence, this was most frequently found among acquired affiliates, large affiliates, strategic independent, and among cluster affiliates. These findings seem to be in line with what can be expected for these types of affiliates.

12.2.2.8 Indications of competence centres

Finally, the present study gave empirical support to the notion that, today, foreign located affiliates of TNCs operate as competence centres on behalf of parent and sister affiliates in various corporate functions. In addition to this, in the present study it was possible to analyse how common it is for foreign affiliates to operate as competence centres, showing that, this is still only found among a minority of affiliates. Here, the findings showing that larger affiliates operate as competence centres on behalf of parent- and sister-affiliates are reasonable, since they probably have a larger set of resources, than smaller affiliates.

12.2.3 Methodology

The main contributions of this study are not believed to be methodological, since the findings have, basically, been derived by a relatively simple cross-tabulation of quantitative data, in combination with a statistical regression analysis. However, in four respects, the applied methodology for estimating these quantitative data is believed to have generated more reliable figures than many other related studies. Firstly, in many comparable studies of exports by foreign affiliates, these are measured as a proportion of total sales. In a situation where the affiliates are not engaged in resale activities, this way of estimating the export-intensity is appropriate. However, since many manufacturing affiliates also operate as marketing channels through resale of products on behalf of parent- and sister-affiliates, mainly selling on the local market,

this method of measuring exports in relation to total sales tends to underestimate the importance of exports, while the extent of host-market production is overestimated. In the present study, resale and manufactured sales are separated, making possible a comparison of manufactured exports in relation to total manufactured sales, giving a more precise estimate of the importance of host market production and exports, than is achieved when exports are measured against total sales.

Secondly, in many studies of imports by foreign affiliates, it is not possible to distinguish between imports of finished products aimed at resale on behalf of parent- or sister-firms, from imports of intermediate inputs goods aimed at further processing. This means that the import-intensity of foreign affiliates tend to be substantial, and in many cases higher than uni-national firms which are not involved in resale activities on behalf of parent and sister affiliates. In the present study, imports of finished products aimed at resale are distinguished from material inputs aimed at further processing by the affiliates, giving an accurate account of the importance of imports by MOFAs. Furthermore, the proportion of imported input goods in relation to purchasing from suppliers in the host country is also believed to be analysed in a more reliable way in the present study, compared to most other studies, since it has been possible to measure the value of imported intermediate imports against total purchases of material inputs, and not against total sales, which is the most common way of estimating the import-intensity of foreign affiliates. As has been discussed above, when the affiliates are engaged in resale and/or where the local value-added is high, the importance of imports may be underestimated. Relating imports of material inputs to total purchases of material inputs gives a more reliable figure of the relative importance of purchasing of intermediate inputs from suppliers located in the host-country and abroad.

Thirdly, parallel to what was discussed above on the methodology for estimating export- and import-intensities, the way intra-firm exports and imports have been estimated in the present study is believed to be more reliable, compared to many other studies on the subject. In the present study it has been possible to distinguish between intra-firm exports of finished products, distributed to external customers through resale activities by parent and sister firms, and intra-firm exports of intermediate inputs aimed at further processing by parent- and sister-affiliates. It has also been possible to relate intra-firm exports of manufactured products to total sales of manufactured products, and not to total sales, which might underestimate the importance of intra-firm exports in a situation where the affiliate is involved in a large amount of resale activities. In terms of intra-firm imports it has also been possible to distinguish between intra-firm imports of finished products aimed at resale by the affiliate, and intra-firm imports of material inputs aimed at further processing by the affiliate. It has also been possible to relate intra-firm purchasing of material inputs to total purchasing of material inputs, giving a more precise estimate than when intra-firm imports are measured against total sales, which might underestimate the importance of intra-firm imports in a situation where the affiliates are involved in resale activities or

have a high level of local value-added.

Another important advantage of the methodology applied in the present study distinguishing intra-firm trade in finished products from material input goods is related to the fact that this facilitates a more thorough analysis of vertical and horizontal integration between MOFAs and other parts of parent corporations, compared to many other studies where intra-firm trade is treated as consisting of intermediate inputs goods only. As was showed in section 9.12, the distinction between vertically and horizontally integrated affiliates became problematic when these analytical concepts were applied to an analysis of MOFAs located in Sweden. The results showed that, in many situations affiliates are integrated through various combinations of intra-firm trade in material inputs and finished products, rather than being either vertically or horizontally integrated.

The fourth methodological contribution of the present study is related to the analysis of the extent in which foreign affiliates operate in industry clusters where host-country firms have generated international competitive advantages. By using firm-level data, it has been possible to extend Porters methodology when identifying competitive industries to include not only products which are possible to classify through international trade statistics, but, in addition, to include all related and supporting firms, which either manufacture inputs goods used by firms operating in various clusters, or, which, by themselves use input goods manufactured by firms in various clusters. Through this methodology, a more complete picture of various industry clusters can be presented when analysing the extent in which MOFAs operate in various industry clusters.

12.3 Outlook for further research

Since the present study is a cross-sectional analysis of integrated international production covering only one year, a first natural objective for further research would be to up-date the findings with more recent data. Ideally, this would consist of regularly surveys, e.g every three or five years, making it possible to discover changes in integrated international production over time.

A second interesting objective for further studies of integrated international production is related to the tendency for many TNCs to establish collaborative linkages with suppliers and customers, especially those operating in internationally competitive industry clusters of host countries. Studies of how these collaborative linkages may benefit the investing TNC, as well as local firms, is crucial for the understanding of competitive industry-clusters as a locational pull-factor, affecting the level, as well as the type of inward direct investment in various countries. In policy-terms, it is also a relevant area of research, since a more complete understanding of how TNCs and local firms interact in order to exploit joint resources is of importance if the country is to be seen as an attractive alternative for international investments.

SUMMARY

This study is an attempt to contribute to an understanding of the emerging pattern of international specialization among transnational corporations (TNCs), by offering an empirical survey of integrated international production in majority-owned foreign affiliates (MOFAs) located in Sweden in 1993.

In Part I, the objectives of the study was presented, together with a discussion of related methodological problems. A review of earlier findings of foreign manufacturing affiliates in Sweden was also provided as a background to the present study. The first, general, objective of the study has been:*to describe the extent of integrated international production, i.e. transactions between MOFAs located in Sweden and their parent- and sister-firms located outside Sweden.*

Some new trends in foreign direct investments have been identified as likely to affect the tendency towards increasing integration between TNC-units. The degree of integrated international production was suspected to vary according to: a) the mode of entry of affiliates, b) the absolute size of affiliates, c) the international strategy applied by the affiliate, and d) the Swedish industry clusters in which the affiliates are operating. Since most of these categories are analytical concepts, not easy to observe empirically, a second objective of the study has been: *to identify variations in: a) the mode of entry of affiliates, b) the absolute size of affiliates, c) the applied international strategy of the affiliates, and, d) the Swedish industry clusters in which the affiliates operate.*

After the different categories of affiliates had been identified the third objective of the study has been: *to analyse the existence of any systematic variations in the extent of integrated international production between affiliates according to a) the mode of entry of affiliates, b) the absolute size of affiliates, c) the applied international strategy of the affiliates, and, d) the Swedish industry clusters in which the affiliates operate.*

The study attempts to give an account of all foreign-owned manufacturing affiliates, operating in Sweden in 1993. The sample firms have been identified by using the most comprehensive register available on foreign-owned firms in Sweden, provided by Statistics Sweden. Out of 690 firms included in the 1992-register, a total of 364 affiliates were found to be potential respondents. Out of these foreign-owned affiliates, which were actually operating manufacturing activities in Sweden, it was possible to receive information from 83 percent. Thus, the study is believed to cover the large majority of foreign manufacturing affiliates operating in Sweden in 1993. The study is based on unique firm-level data, collected through a structured questionnaire. In order to receive the most reliable data, the information was collected from the general manager, alternatively the head of finance, as these executives were believed to be the most suitable respondents.

Part II discusses basic concepts, theories and earlier empirical findings which can be related to a number of aspects of integrated international production that are analysed in the study. Seven research questions was thereafter put up in order to discuss the first, general objective of the study:

i) To what extent are MOFAs' products sold on the Swedish host market, alternatively, exported to different foreign markets, distinguishing between manufactured products and resale?

ii) To what extent are MOFAs integrated with other parts of parent-corporation through intra-firm sales of manufactured products, distinguishing between intermediate input-goods aimed at further processing by sister- or parent-firms, and finished goods aimed at resale to external customers?

iii) To what extent are MOFA purchasing material inputs from suppliers in Sweden, alternatively importing them from suppliers abroad?

iv) To what extent are MOFAs vertically integrated with parent- and sister-firms through intra-firm purchases of material inputs?

v) To what extent are different functional activities of MOFAs coordinated with parent- and sister-firms?

vi) To what extent are MOFAs involved in cooperation with parent- and sister-firms, alternatively, external firms (e.g. suppliers and customers) in order to generate technological competence?

vii) To what extent do MOFAs operate as competence centres, indicated by their having corporate responsibilities in different functional areas, on behalf of parent- and sister-firms?

Part III presented the general findings of all MOFAs included in the study. Based on the seven research questions, the major findings may be summarized as follows. In terms of *host-market production and exports,* less than half of MOFAs' manufactured products were sold in the Swedish host market, while most of exports were directed to Western Europe. As many as 90 percent of all MOFAs had at least some manufactured exports, and 40 percent exported most of their output. In relation to *intra-firm sales*, 40 percent of MOFAs' manufactured exports were intra-firm, representing 25 percent of their total sales. In total, 70 percent of exporting MOFAs had at least some intra-firm exports and one-third exported most of their products on an intra-firm basis. Almost all intra-firm exports consisted of finished products, aimed at external customers.

Concerning *purchasing of material inputs,* less than half (45%) of total purchasing of material inputs were bought from suppliers in Sweden, while the rest were imported mainly from suppliers in Western Europe. Almost all MOFAs (95%) imported at least some material inputs, and over one third purchased most of their inputs from suppliers abroad. The findings of *intra-firm purchases of material inputs* showed that intra-firm deliveries from parent- and sister-affiliates were responsible for around 30 percent of all imports of material inputs, corresponding to 18 percent of all purchases of material inputs. Almost half of MOFAs had at least some intra-firm imports of material inputs, while 22 percent imported their inputs mainly on an intra-firm basis. Intra-firm deliveries of material inputs originated mainly from parent and sister affiliates located in Western Europe and the Nordic countries.

In terms of *intra-corporate coordination of different functional activities* the R&D and finance functions were coordinated in over 60 percent of MOFAs, while the marketing function were coordinated in 40 percent, and the sales, procurement and administration functions in 30 percent of MOFAs. Quality control, manufacturing, distribution and after-sale services were

coordinated in only 7-16 percent of MOFAs. The findings of *intra-corporate and inter-firm cooperation in order to generate technological competence,* showed that 40 percent of MOFAs claimed that they were extensively engaged in technological cooperation with corporate firms abroad, while 18 percent indicated that they cooperated extensively with external firms in Sweden. At the same time, over 70 percent of MOFAs claimed that their technological competence was mainly developed internally by themselves, while one fifth of MOFAs indicated that parent- and sister-firms abroad were the main source for development of technological competence. Looking to the relatively most important partner when developing technological competence, over half of MOFAs (54%), indicated that parent- and sister-firms abroad were their main partner, while 27 percent claimed external firms in Sweden as being most important. In terms of *MOFAs operating as competence centres on behalf of parent-and sister-firms* it was found that almost one quarter of MOFAs (23%), indicated that they operated as competence centres, with corporate responsibility in at least one functional area on behalf of at least one sister or parent firm. Competence centres were above all found in R&D, marketing and sales, (around 6-7 % of MOFAs), while very few competence centres were found in quality control, procurement and distribution. In three quarters of the competence centres, this included operations outside the Nordic countries, while in one quarter it only included the Nordic operations.

Part IV presented the findings related to the second objective of the study, showing that, in terms of *the mode of entry,* 87 percent were acquired, while 13 percent were green-field investments. In terms of the *size of affiliates,* half of MOFAs were identified as large affiliates, employing at least 100 persons, while half were identified as small affiliates, employing less than 100 persons. Investigating the *international strategy* of MOFAs, 28 percent were found to operate as miniature replicas, (restricted to host country production), 23 percent as rationalized manufacturers, (specialized to produce one or a few products for exports), and 47 percent operated as strategic independents (no restrictions of geographical markets or products). Finally, in terms of *industry clusters,* over half of MOFAs (56%) operated in internationally competitive Swedish industry-clusters, while 44% were related to other industries.

After these different types of MOFAs had been identified, the third objective of the study was to analyse the existence of any systematic variations in the extent of integrated international production between the different categories of affiliates. The possible variations in internationally integrated production were captured by comparing the different categories of affiliates using the seven research questions, presented above. Firstly, the findings related to *exports and intra-firm trade* suggest that there are variations between different types of MOFAs. Exporting affiliates were above all associated with acquired affiliates, large affiliates and with affiliates operating as rationalized manufacturers. A somewhat higher export-intensity was also found in cluster affiliates, compared to non-cluster affiliates. Intra-firm exports were found to be especially high in large affiliates, in affiliates operating as rationalized manufacturers, and in non-cluster affiliates. Only small differences were found between green-field and acquired affiliates.

The findings on *imports of material inputs and intra-firm purchasing* showed that imports of material inputs were especially high in green-field affiliates, small affiliates, and rationalized manufacturers, while only marginal differences were found between cluster and non-cluster affiliates. In terms of intra-firm imports, again this was found to be highest in green-field affiliates, rationalized manufacturers, and smaller affiliates, while only small differences were found between cluster and non cluster affiliates.

The findings on *coordination of various functional activities*, showed that, generally, this was most frequent in the larger affiliates and in miniature replicas. No clear differences in terms of coordination could be found between green-field and acquired affiliates. Instead, a larger share of green-field affiliates tend to coordinate their up-stream activities, e.g. R&D, procurement and manufacturing, while a larger share of acquired affiliates coordinate their down-stream activities, e.g. marketing, sales and distribution. Coordination were also relatively frequently found in non-cluster affiliates. Affiliates which extensively *cooperated with parent- and sister-firms in order to generate technological competence* were, above all, found among green-field affiliates, large affiliates and miniature replicas, while only smaller differences were found between cluster and non-cluster affiliates. Finally, the findings on affiliates *operating as competence centres* showed that this was, above all, related to large affiliates, and to a lesser degree, also to non-cluster affiliates. The findings also showed that rationalized manufacturers and strategic independents tended to operate as competence centres to the same extent. Only marginal differences were found as regards the mode of entry.

It was difficult to identify any type of MOFAs with a high degree of integration in all the analysed dimensions. However, it was found that, according to the mode of entry, green-field investment affiliates were more integrated than acquired affiliates. According to the size of affiliates, the larger affiliates seem generally to be more integrated compared to the smaller. Looking at affiliates operating with differentiated international strategies, the rationalized manufacturers tend to be relatively most integrated in most of the analysed dimensions. Finally, in terms of affiliates operating in different Swedish industry clusters, the tendency is less clear, although non-cluster affiliates seem to be engaged in integrated international production to a somewhat larger extent. By applying a statistical multiple regression analysis it was found that exports were positively correlated with large affiliates and with specialized affiliates, i.e affiliates responsible for producing all or most of a certain product of the parent corporation. This suggests that exports are also positively correlated with rationalized manufacturers or strategic independents, while negatively correlated with miniature replicas. The regression analysis also showed that intra-firm exports was correlated with non-cluster affiliates. A negative correlation between specialized affiliates and intra-firm imports was also found, which seems to be contrary to what was suggested above, showing that rationalized manufacturers were highly involved in intra-firm imports. However, this is probably due to the fact that a large number of strategic independent affiliates, which on average, are least dependent on intra-firm imports, are included among the specialised affiliates. Finally, the regression analysis also showed that the extent in which MOFAs were involved in cooperation with parent- and sister-affiliates in order to develop technological competence, was negatively associated with specialised affiliates, suggesting that horizontally integrated affiliates, i.e miniature replicas, are most involved in intra-corporate technological cooperation.

In summary, the empirical findings of the study provide a reference for comparative studies, both in terms of longitudinal analysis of changes in integrated international production among foreign affiliates located in Sweden through time, as well as inter-country comparisons in integrated international production between affiliates located in different countries. By providing detailed informations about exports, imports, intra-firm trade and integration of various parts of the value-chain, the study is believed to contribute to a better understanding of the organisation of integrated international production among TNCs and their foreign affiliates. The detailed information on various sales and purchasing markets, including those of intra-firm trade, is

probably not found in many other comparable studies and is believed to give a interesting contribution to the subject. The findings on the extent of intra-corporate coordination of different functional activities, cooperation with corporate firms and external firms in order to generate technological competence, as well as the findings related to foreign affiliates operating as competence centres, are believed to be a valuable complement to the small pool of findings of the subject. In addition to most other studies, the present study not only identifies these phenomenon, but, also, gives an account of their relative importance. The empirical findings related to variations in integrated international production between the four different types of affiliates, is also believed to have a wider interest. Especially the findings which show the extent in which MOFAs operate with differentiated international strategies, in terms of market and product scope are believed to leave a valuable contribution. Although other studies have analysed the existence of various international strategies among foreign affiliates, the detailed information in the present study is believed to be of a general interest. Also, the empirical findings which show the extent in which MOFAs operate in various industry clusters are believed to have a broader interest. These findings, which are probably one of the first to have been undertaken based on firm level data, are believed to make a contribution to the understanding of industry clusters as a pull factor attracting foreign investments.

Findings with implications for established TNC-theory

An attempt has been made to make comparisons with earlier findings on foreign affiliates in Sweden, as well as on foreign affiliates located in other comparable countries. Through these comparisons, some tendencies as to the extent that integrated international production among foreign manufacturing affiliates in Sweden has changed during the last decades, can be obtained. By comparing with findings on affiliates located in other countries, some insight as to what extent the findings of MOFAs in Sweden are specific is possible. Together, these comparisons facilitate comparisons with established TNC theory.

The analysis of *integrated international production between different types of MOFAs* suggests, firstly, that the dominant trend in recent decades of expanding abroad by means of acquisitions of existing companies, might result in a relative stagnation in terms of integration between different TNC units, since acquired affiliates, generally, tend to be less integrated compared to green-field investments. On the other hand, the tendency for many foreign located affiliates to have become large during the years, may lead to increased integration between affiliates and parent firms, since, contrary to what could be expected, larger affiliates seem to be more integrated with other parts of parent corporations, than smaller affiliates. Another factor which may lead to continued integration between TNC-units is related to the fact that, today, many affiliates are involved in cross-border product or process specialisation, characterized by rationalized production of one or a few products, aimed at the international market. Since these types of affiliates were found to be among the most integrated, a continued strategy among TNCs to rationalize their production in order to receive economies of scale, may also lead to more integration between various parts of the TNC system. Finally, the recently observed tendency of many TNCs to complement their competitive advantages by investing in competitive industry clusters in various host-countries, may in the long run lead to an increased integration between different parts of the TNC. However, the results from the present study showed no

clear tendency towards more integration between affiliates operating in competitive Swedish industry clusters and the rest of the parent corporations, compared to affiliates operating in other industries. Instead, the findings suggested that the latter type of affiliates tend to be somewhat more integrated in most analysed dimensions.

In terms of *exports,* MOFAs in Sweden was found to be relatively more export-oriented than Japanese, US and Swedish affiliates located in the EU, as well as foreign affiliates located in France and Finland, for which comparable data are available. As has also been suggested for foreign located affiliates in general, the export intensity of MOFAs in Sweden has increased, at least since the 1960s. Furthermore, the findings confirm the view that foreign affiliates tend to be more export-oriented compared to domestic firms in general, and that they tend to be more export oriented in all, or most, industries, rather than to be concentrated in export-oriented industries. Moreover, the findings support the general perspective that MOFAs exports are mainly are directed to third country markets, rather than to the home market of the parent company. In addition to what is normally suggested, the findings indicate that exporting affiliates also serve adjacent trading areas, and extra-continental markets. The findings related to exports among different types of affiliates support the perspective that green-field investments are generally host-market orientated, while acquired affiliates are export-oriented to a larger extent. These findings confirm results from the 1960s, which showed that exports from Sweden were mainly performed by acquired affiliates, rather than by green-field affiliates. The findings gave also empirical support to established theory suggesting that exports by foreign affiliates are associated with large affiliates. These findings also confirm those from the 1960s, which also showed that exports from Sweden were mainly performed by large, rather than small, affiliates. Furthermore, the findings also give support to other studies showing that the highest propensities among affiliates to engage in exports are found in TNCs operating strategies of cross-border product or process specialization, e.g. rationalized production.

In terms of *intra-firm exports*, measured in relation to total exports, MOFAs in Sweden were found to be less engaged in intra-firm exports than US affiliates located in Europe, but more involved in intra-firm exports compared to foreign affiliates of Swedish TNCs. However measured as intra-firm exports in relation to total sales, MOFAs were found to be involved in intra-firm exports to the same extent as US affiliates located in the EC. The findings support the idea that, recently, intra-firm exports, in general, tend to decrease or stagnate in relation to total exports. Furthermore, the present study also supports recent findings suggesting that intra-firm trade is not necessarily associated with vertical integration in terms of intra-firm exports of material inputs, but also, that finished products, aimed at external customers are sold to a large extent through intra-firm exports. This explains why, contrary to what is suggested by many theories on intra-firm trade, substantial shares of intra-firm exports can be found in "low tech"-industries, and not only in "high-tech" industries. Finally, in addition to what is normally suggested, the findings of the present study suggest that intra-firm exports by foreign affiliates are not only directed to other countries inside a specific regional trading-area, but that affiliates also serve adjacent trading areas, and even extra-continental markets. The findings on variations in intra-firm exports between different types of affiliates support the view that these are above all found in TNCs operating strategies of cross-border product or process specialization. The present findings confirm studies showing that green-field and acquired affiliates use intra-firm exports to the same extent. What might be surprising is that larger affiliates seem to be more dependent than smaller affiliates on intra-firm exports. The findings also showed that cluster affiliates were less involved in intra-firm exports than non-cluster affiliates. Since it is

theoretically difficult to argue why this is so, and since no comparable studies are available, these findings are difficult to evaluate.

In terms of *imports of material inputs*, the share of total purchases accounted for by domestic purchases and imports has been analysed. Unfortunately, since no comparable up-to date surveys have been found, it has not been possible to compare these findings on import-intensities among MOFAs in Sweden with affiliates located in other countries. However, the findings give some support to the idea that foreign affiliates, over time, increase their domestic purchases of material inputs, and that imports decrease in relative importance. Also, the findings of the present study corroborate the idea that foreign affiliates are more import-intensive, compared to domestic firms, mainly because they are more import intensive in most industries, rather than being concentrated in import-intensive industries. The findings from the present study also gave some support, albeit weak, to the notion that affiliates that coordinate their purchasing function with parent and sister affiliates are more involved in imports and less involved in domestic purchasing, compared to non-coordinated affiliates. The findings of variations in imports between different types of MOFAs confirm the idea that green-field affiliates often import a large share of their inputs. However, contrary to what was suspected, rationalized manufacturers were found to be more import-intensive than miniature replicas.

The findings on *intra-firm imports* of material inputs showed that, compared to foreign affiliates of Swedish TNCs, MOFAs in Sweden were equally involved in intra-firm imports, except for those affiliates operating in the transportation and electronics industries, where the former affiliates are more involved in intra-firm imports of material inputs. More generally, the findings support the perspective that intra-firm imports, in relation to total imports, have stagnated or decreased in recent years. Contrary to what is normally suggested, the findings indicate that comparably high shares of intra-firm imports of material inputs can be found not only in industries which normally are characterized as high-tech industries, but also in other industries. Also in addition to what is normally suggested, the present findings suggest that intra-firm imports by foreign affiliates are not only organized inside a specific regional trading-area, but that affiliates are also supplied through intra-firm imports of material inputs from corporate firms located in adjacent trading areas, as well as in extra-continental regions. The findings on variations between different type of MOFAs as regards intra-firm imports support the view that green-field investments are often involved in a large amount of intra-firm importing of material inputs. This is also in line with what has been found among foreign affiliates of Swedish TNCs, showing that acquired affiliates, on average, are substantially less dependent of intra-firm imports compared to green-field affiliates. Again, contrary to what could be suspected, rationalized manufacturers rather than miniature replicas were most involved in intra-firm imports. One of the most interesting findings of the present study shows that the distinction between vertically and horizontally integrated affiliates is difficult to make when using detailed firm-level data on intra-firm trade, since many affiliates were characterised by a combination of these two types of integration strategies. For example, horizontally integrated affiliates tend not only to import finished products for resale, but also inputs from parent- and sister-affiliates. Furthermore, the type of affiliate which can be said to be most vertically integrated, supplied to the largest extent by inputs from parent- and sister-firms abroad, e.g rationalized manufacturers, are also found to be most export-intensive and also most involved in intra-firm exports, consisting mainly of finished products aimed at external customers.

The analysis of *corporate integration of various parts of affiliates' value chain* showed, that in terms of coordination, the findings support the perspective that, today, a number of TNCs and their affiliates manage various parts of their functional activities in an integrated fashion. Broadly speaking, the most common activities which MOFAs in Sweden coordinate with parent- and sister-affiliates seem to be the same as has been found in other surveys. In addition to this, the present study gave some indications as to the share of affiliates which coordinate their functional activities with parent- and sister-affiliates. This showed that most MOFAs still operate their functional activities in an un-coordinated fashion, except for the finance and R&D functions, where a great majority of the affiliates seem to be integrated with parent and sister firms. In line with what could be expected, a large number of affiliates operating as miniature replicas indicated that they coordinated their functional activities with parent and sister affiliates. The findings also showed that green-field affiliates were not generally more coordinated, than acquired affiliates. Instead the findings suggest that acquired affiliates coordinate their down-stream activities, to a larger extent, while green field investment affiliates coordinate their up-stream activities. Furthermore, contrary to what could be expected, coordination was also frequently found among larger affiliates. The findings showing that cluster affiliates are less coordinated, compared to non-cluster affiliates, is in line with what could be suspected, since cluster affiliates probably have closer contacts with suppliers and customers in the host country.

In terms of *intra-corporate, and inter-firm cooperation in order to generate technological competence*, the findings show that a great majority believe that parent- and sister-affiliates are of secondary importance for generating their technological competence. Instead, technological competence is mainly developed internally by the affiliates themselves. Moreover, the findings indicate also that parent and sister affiliates are still the most important partners when generating technological competence, although a sizeable share of affiliates generate their technological competence mainly among suppliers and customers in the host country. Thus, this supports other findings showing that many manufacturing TNCs find that linkages with foreign firms are one of their most important sources of competitiveness. The findings showing that green-field affiliates and miniature replicas were relatively most involved in cooperation with parent and sister affiliates is in line with what can be expected. While the findings suggesting that larger affiliates are frequently involved in cooperation with parent and sister affiliates in order to generate technological competence might be surprising. In terms of cooperation with external firms in order to generate technological competence, this was most frequently found among acquired affiliates, large affiliates, strategic independent, and among cluster affiliates. These findings seem to be in line with what can be expected for these types of affiliates.

Finally, the present study gave empirical support to the notion that, today, foreign located affiliates of TNCs operate as *competence centres* on behalf of parent and sister affiliates in various corporate functions. In addition to this, in the present study it was also possible to analyse how common it is for foreign affiliates to operate as competence centres, showing that this is still only found among a minority of affiliates. Here, the findings showing that larger affiliates operate as competence centres on behalf of parent- and sister-affiliates are reasonable, since they probably have a larger set of resources, than smaller affiliates.

Methodology

The main contributions of this study are not believed to be methodological, since the findings have, basically, been derived from a relatively simple cross-tabulation of quantitative data, in combination with a statistical regression analysis. However, in four respects, the applied methodology for estimating these quantitative data is believed to have generated more reliable figures compared to many other related studies. Firstly, *resale and manufactured sales are separated*, making possible a comparison of manufactured exports in relation to total manufactured sales, giving a more precise estimate of the importance of host market production and exports, than is achieved when exports are measured against total sales. Secondly, *imports of finished products aimed at resale are distinguished from material inputs* aimed at further processing by the affiliates, giving an accurate account of the importance of imports by MOFAs. Furthermore, it has been possible to measure the value of imported intermediate imports against total purchases of material inputs, and not against total sales, which is the most common way of estimating the import-intensity of foreign affiliates. Thirdly, it has been possible to distinguish between *intra-firm exports of finished products and material inputs*. Moreover, intra-firm exports of manufactured products are measured against total sales of manufactured products, and not total sales, which underestimate the importance of intra-firm exports in a situation where the affiliate is involved in a large amount of resale activities. In terms of intra-firm imports it has also been possible to distinguish between intra-firm imports of finished products aimed at resale by the affiliate, and intra-firm imports of material inputs aimed at further processing by the affiliate. It has also been possible to relate intra-firm purchasing of material inputs to total purchasing of material inputs, giving a more precise estimate than when intra-firm imports are measured against total sales, which might underestimate the importance of intra-firm imports in a situation where the affiliates are involved in resale activities or have a high level of local value-added. The fourth methodological contribution is related to the analysis of *foreign affiliates operating in industry clusters* where host-country firms have generated international competitive advantages. By using firm-level data, it has been possible to extend Porters methodology when identifying competitive industries to include not only products which are possible to classify through international trade statistics, but, in addition, to include all related and supporting firms, which either manufacture inputs goods used by firms operating in various clusters, or, which, by themselves use input goods manufactured by firms in various clusters.

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Appendix 1. *Questionnaire distributed to MOFAs in Sweden (Originally in Swedish)*

SURVEY: FOREIGN OWNED COMPANIES IN SWEDEN

Company name.....Telephone.....

Respondent name.....Position.....

The company [] have no manufacturing operations [] is not foreign owned

NOTE! No further information is needed if the company
have no manufacturing operations, or, if it is not foreign owned

The company is manufacturing following products:

1. ....% of sales
2. ....% of sales
3. ....% of sales

Total number of employees.....

Parent company in Sweden.....

Own manufacturing affiliates.....

Foreign parent corporation.....

Home country of parent corporation .....

Incorporated as : [] Green-field investment (year)..... [] Acquisition (year).....

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1. *How much of your parent corporations total sales of your company's main product are supplied by your company, respectively other corporate firms?*

We are producing.....% Corporate firms in: Western Europe.....% N. Am.....% Rest of World.....%

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2. *Total sales (including sales to corporate firms)* .....MSEK

of which: a) goods manufactured or assembled by the company .....MSEK

b) resale on behalf of corporate firms (daughter-, sister-, or mother company) .....MSEK

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3. *Total <u>exports</u> (sales outside Sweden including sales to corporate firms)* .....MSEK

of which: a) exports of manufactured goods for direct resale by corporate firms .....MSEK

b) exports of manufactured raw materials/material inputs for processing by corporate firms .....MSEK

c) exports of manufactured goods to external customers (non-corporate firms) .....MSEK

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4. *Main markets for <u>manufactured</u> goods, produced by the company (cf. question 2a)*

	Sweden	Nordic excl. Sweden	Western-Europe	Russia-East Europe	North America	Latin America	Japan SE-Asia	Rest of World
Sales of manufactured goods	……%	……%	……%	……%	……%	……%	……%	……%

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5. *Main markets for <u>resales</u> of goods, manufactured by other corporate firms (cf. question 2b)*

	Sweden	Nordic excl. Sweden	Western-Europe	Russia-East Europe	North America	Latin America	Japan SE-Asia	Rest of World
Resale of goods on behalf of corporate firms in	……%	……%	……%	……%	……%	……%	……%	……%

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6. *<u>Supply regions</u> of goods for resale on behalf of corporate firms (cf. question 2b)?*

	Sweden	Nordic excl. Sweden	Western-Europe	Russia-East Europe	North America	Latin America	Japan SE-Asia	Rest of World
Resales of goods produced by corporate firms located in	……%	……%	……%	……%	……%	……%	……%	……%

7.*Export markets of raw materials/ material inputs for further processing by corporate firms (cf. question 3b)*

Exports of raw materials / material inputs to corporate firms located in	Nordic excl. Sweden	Western Europe	Russia-East Europe	North-America	Latin-America	Japan SE-Asia	Rest of World
	……..%	……..%	……..%	……..%	……..%	……..%	……..%

8. *Total value of purchased raw materials/material inputs used for further processing (per year)?*

Raw materials/material inputs.....MSEK of which from: a) external firms.....MSEK b) corporate firms.....MSEK

9. *Purchasing markets for raw materials/material inputs from external suppliers (cf. question 8a)*

Purchases from external suppliers located in	Sweden	Nordic excl. Sweden	Western-Europe	Russia East Europe	North America	Latin America	Japan SE-Asia	Rest of World
	……..%	……..%	……..%	……..%	……..%	……..%	……..%	……..%

10. *Purchasing markets for raw materials/material inputs from corporate firms (cf. question 8b)*

Purchases from corporate firms located in	Sweden	Nordic excl. Sweden	Western-Europe	Russia-East Europe	North America	Latin America	Japan SE-Asia	Rest World
	……..%	……..%	……..%	……..%	……..%	……..%	……..%	……..%

11. Y*early R&D expenditures* .....MSEK, of which .....% is fees to corporate firms for performed R&D, licences

12. *How much of total sales of manufactured output is based on parent corporations technical know-how? .....%*

13. *Which, of the following R&D activities, is performed by your company?*

[] Development of for the market complete new products
[] Development of completely new manufacturing processes/systems
[] Development of for the company new, but on the market existing product
[] Improvement of existing products
[] Improvement of existing manufacturing processes
[] Local market adoption of products
[] R&D in marketing
[] Customer technical services
[] Other R&D
[] No R&D activity performed

14. *Does your company have organized and lasting technological cooperation with following types of firms?*
Indicate: 0=Non existing, 1=to a marginal extent, 2=to a certain extent, 3=to a large extent, 4=to a very large extent

....Corporate firms in Sweden .....External firms in Sweden (customer/supplier) ... R&D institutions in Sweden
....Corporate firms abroad .....External firms abroad (customer/supplier) ....R&D institutions abroad

15. *In your opinion, which is the three most important sources of your company's technological competence?*
Indicate: 1=most important, 2=second most important, 3=third most important

.....Indigenously developed competence
.....Cooperation with corporate firms in Sweden
.....Cooperation with corporate firms abroad
.....Cooperation with external firms in Sweden
.....Cooperation with external firms abroad
.....Cooperation with R&D institutions in Sweden
.....Cooperation with R&D institutions abroad
.....Other.....

16. *Which are the three most important resources your company receives by being part of your foreign parent corporation? Indicate: 1=most important, 2=second most important, 3=third most important*

.....Access to product technology
.....Access to process technology
.....Access to other type of know how/expertise
.....Access to a international marketing organization
.....Access to a international procurement organization
.....Access to parent corporations good will
.....Possibility of achieving scale economies in production
.....Financial support

17. *Which, of the functional areas below, are your company performing, and responsible for, and which areas are partly or completely coordinated with corporate firms abroad?*

Functional areas	Our company is performing, and are responsible for	Partly/completely coordinated with corporate firms abroad
R&D	[]	[]
Procurement of inputs	[]	[]
Input quality control	[]	[]
Manufacturing	[]	[]
Output quality control	[]	[]
Marketing	[]	[]
Sales	[]	[]
Distribution	[]	[]
After-sale service	[]	[]
Finance	[]	[]
Administration, human resources	[]	[]

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18. *Does there exist any coordination with corporate firms abroad of your company's*
a) product scope (e.g. in terms of product specialization)

[] No [] Yes, we have received corporate responsibility for manufacturing following products:

.....

.....representing approximately.....% of our total sales of manufactured output

b) geographical market scope, (e.g in which markets are your company's manufactured output being sold)?

[] No [] Yes we have received corporate responsibility for sales in following geographical markets:

.....

.....representing approximately.....% of our total sales of manufactured output

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19. *Has your company received any corporate-wide responsibility in any of the functional areas in question 17, including other corporate firms/operations? In which countries is these firms/operation in that case located?*

[] No corporate responsibility received

[] Yes, our company has received corporate wide responsibility in following functional areas — Including corporate firms/operations in following countries

.....	.....
.....	.....
.....	.....
.....	.....

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20. *Which of the following main categories of subsidiaries is the best description of your company?*

1 Miniature replica; Affiliate which produces and markets one or more of the parent corporations product lines or related product lines on the local or adjacent market.

2 Rationalized manufacturer; Affiliate which is specialized to produce a limited number of products or components for many international markets. The affiliate may play the role of corporate supplier of these products or components.

3 Strategic independent: Affiliate which have the freedom and resources to develop their own product-lines for local, regional or international markets.

[] Category.....is the best description of our company