INTERNATIONAL FREIGHT TRANSPORTATION:
A STUDY ON MNC-BASED CHINA-SWEDEN TRADE FLOWS

Master Thesis

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Ronneby, 2009
ACKNOWLEDGEMENTS

First of all, the author would like to express her gratitude to everybody who has been involved and provided the information during the work with this thesis. The profound gratitude goes to Mattias Alisch at EWTC, who made this thesis possible by helping the author understand EWTC and supporting the author in many different ways. And the author will thank her supervisor Gunnar Ågren for his great contribution to this research, especially his consistent help. Finally the author wants to thank Anders Nilsson for his work.
ABSTRACT:

The purpose of this thesis is to offer a general picture of MNCs’ freight transportation activities in China-Sweden trade, and to explore the reasons by comparison with related theories.

The study has been based on interviews with eleven Swedish companies and two Chinese companies, who have transported their commodities between China and Sweden. Interviews have been used to collect the data that later on has been compared to the information collected by a literature study. The main conclusions are as follows:

- Although the trade flows between China and Sweden have been keeping increasing in recent years and China has shown stronger ability to export to Sweden, some challenges have emerged from the perspectives of MNC. The first challenge has come from the competition from some other developing countries, which may replace the function of China as production base within some Swedish rooted firms, like Ericsson and Sony Ericsson, since the cost in China has kept increasing. The second competition has come from the East European suppliers, since they have had the cost advantage due to the shorter distance transportation. The third one has been due to the updating production ability of Chinese factories, and therefore the exports from Sweden can be replaced by local supply. However, opportunities have co-existed. The intra-firm trade, like Sandvik and Tetra Pak, may increase, because of the quick development of their Chinese affiliates. And the Swedish products with high quality, like Volvo Construction Equipment, may have good sales in Chinese market in the future, due to the strong demand in China. Additionally, policy changes may be positive or negative to the trade increase, and as a result, the trade trend has been hard to predict, just like the situation H&M has faced.

- Trade theories have partly worked in this research, but the great heterogeneity of firms together and the changing policies have made the estimation of freight demand to be very difficult. Anyway, to understand the final markets needs and the roles of different foreign affiliates of MNCs could be the key.

- On the trade type, finished goods have dominated the trade market. Intra-firm trade has not been common among these MNCs, but arm-lengths trade has often been used. The reasons
may lie in two aspects. On one side, Swedish rooted MNCs’ affiliates in China have usually been defined the role as “local production and local sales”; on the other side, market orientation has seemed to be the main driven force.

• On transport mode, shipping by sea has been the most frequent choice made by the interviewed firms, then by air. Commodities with high value have usually chosen air transportation; while others have mainly been moved by sea. Besides the value of commodities traded, the physical attributes of commodities, like size, weight and etc., should also been taken into consideration when deciding transport mode. Characteristics of firms have not made a great influence on the mode choice, but the requirements from final customer and the physical attributes of goods have really did.

• And generally speaking, reliability, price and lead time have to be the key transportation attributes which MNCs interviewed in this research have most concerned on. It can be inferred that on-time pickup and delivery will still be basic and important requirement of firms for carriers, and that a solid and long time relationship between shippers and carriers will still be expected to establish.
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CHAPTER ONE: INTRODUCTION

1.1 Background

Researches on international freight transportation have never been stopped, and related literatures widely spread in all kinds of publications. The history of international freight transportation is very long. Silk Road, one of the world’s oldest and most historically important trade routes, can be seen as a good example, who has testified the boom and slump of freight transportation in the international trade along this corridor for thousands of years.

As time goes by, huge changes have happened to international freight transportation, in volume, value and scope. And the academic work on international freight transportation should keep up with this new era featured by globalization, which means “the growing integration of economies and societies around the world” (The World Bank, 2008).

Nowadays, what has changed is not the basic activity of freight transportation - to move goods over time and space, but the concept of transportation has been really enriched in the context of globalization. OECD believed that “the globalization of industry, including planning, sourcing, manufacturing and marketing activities has resulted in more complex trading and much more developed transport networks”, and that “the trend towards globalization and logistics is in the process of reshaping transport activities” (OECD, 2002, p.8). As a central contributor to globalization, transportation has “served as the vehicle for intensifying mass consumption of resources and goods beyond subsistence levels for many centuries” (Donald and Michel, 1997, p.205).

Consequently, the author believes the research on international freight transportation should be given renewed perspectives, and these perspectives must reflect the theme of this new era. It is no doubt that MNC\(^1\) is one of the dominant factors in globalization. Through involving in around two-thirds of world trade and driving FDI flow, MNCs are playing one of the most significant

\(^1\) MNC: multinational corporate.
roles contributing to globalization (UNCTAD\(^2\), 2002, p.153).

Although the role of MNCs in globalization has never been neglected, unfortunately researches connecting MNCs with international freight transportation have not often been touched, both empirically and theoretically. And the author believes that the research of freight transportation in MNC-based trade will produce interesting results to enrich the present academic work. On one hand, MNCs actually “drive trade flows”; on the other hand, MNCs put forward the need of freight transportation service, in order to make their global activities of possible (Andrew, 2007).

Highlighting the role of MNCs in freight transportation, this paper employs the perspective from MNCs to make an up-to-date academic job on international freight transportation. For better illustration, MNC-based China-Sweden trade has been chosen. The reasons for why the two countries- Sweden and China- have been selected come from the considerations on three aspects. First of all, the author has more knowledge about the two countries than others. China is the motherland of the author and the author has spent more than one year studying business in Sweden. Secondly, Sweden has been regarded as illustrative in the case of world trade with its highly international oriented economy, reflected by the number and size of Swedish rooted MNCs\(^3\), which can bring a lot of convenience to the acquisition of empirical data for the study. And as an important emerging economic power, China has become an active player in world trade; now China is not only outstanding among the developing countries, but also makes a powerful influence on the world economy. Thirdly, as an associated student of EWTC\(^4\), who has a consistent interest in China-Sweden freight transportation, the author hopes that this article can contribute to their business.

1.2 Research Questions and Objectives

The author wants to offer a general picture of MNCs` freight transportation activities in China-Sweden trade, and to explore the reasons by comparison with related theories.

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\(^3\) See 3.2 for detailed explanation.

\(^4\) East West Transport Corridor, which is a transport project focusing on the development of Baltic Sea Region, meanwhile with business ambition extending to Asian markets including China. For detailed information, please see their website: www.eastwesttc.org.
Thus, the research questions of the study are as following: what is the status quo of MNCs’ transportation activities in China-Sweden trade? What theories can explain the situation? And what kind of empirical conclusions can be made? In order to answer the research questions, the author sets following goals:

- To investigate MNCs’ transportation activities in the trade flow between China and Sweden, including researches on volume in trade, origin and destination, types of goods shipped, choice on modes, and transportation quality required.

- To discuss the relationship between previous researches on freight demand characteristics and the behaviors of MNCs in international freight transportation in this case.

- To make conclusions from this empirical study, offering new insights in this field.

### 1.3 Significance of the Study

The author chooses to write the master thesis focusing on freight transportation between China and Sweden by employing the perspectives from MNCs, not only because it is a topic of great interest for personal preference, but also because this research is expected to generate some practical thinking for business community in Sweden and China. The research has been conducted from a new angle, not from the supply side of freight transportation but from the demand side, therefore this paper with the novel perspective and analysis could be viewed as the supplementary material to traditional researches.

The academic value of this thesis lies in its exploring spirit, and its fresh output in the given topic. The traditional analysis of freight trend on industry and country level mainly deals with macro data and information, for example data like GDP. In a different way, this paper puts most emphasis on firm’s level, on micro level. The research is quite exploratory. What is more, the countries for analysis in this thesis represent different types of economy power in the world, since China as a dynamic developing economy in Asia, while Sweden as a developed country in Europe.

Additionally, the result of this research, which will be given to the readers later in the text, could become very useful information for some organization who wants to open business on freight
transportation in the China-Sweden line and for some organisation who wants to improve their established business in this field, and also for policy makers at the country level or regional level.

Especially, this study is hoped to offer new insights for EWTC people to make a sound judgment on their business expansion plan in Asia.

1.4 Disposition

This paper consists of 8 sections. Chapter 2 takes a general look at the world freight transportation and offers a brief introduction of China-Sweden trade and freight transportation. The problem overview is followed by a thorough description of the method used within the study, Chapter 3. Thereafter a summary of the theories used within the study follows in Chapter 4. Chapter 5 presents the interview result of MNCs’ transportation activities in the bilateral trade, together with secondary date complemented on the target MNCs. And in Chapter 6, through the combination with theoretical research, an analysis result is given. Then, the conclusions are summarized in Chapter 7. Finally, Chapter 8 points out the limitation of this paper and suggests future research on the topic.
CHAPTER TWO: BACKGROUND- FREIGHT TRANSPORTATION BETWEEN CHINA AND SWEDEN

Freight transportation supports a wide array of movements of goods between nations and regions, enabling the international trade occur. “For as long that there has been trade, transportation activities have been present to support it. One is the prerequisite for the other; they are both mutually interdependent” (Rodrigue, 2008).

Accordingly, the position of transportation in today’s economy has been reinforced due to the increasing importance of international trade, which has experienced a rapid growth in the last decade and made a profound impact on the world economy. “The sheer size, scale and growth of trade and its (potential) impact on development are the main features of globalization” (UNCTAD, 2008, p.15). From this point of view, it could be said that it is a trade-based globalization.

2.1 Global Overview in Trade and Transportation

An introduction of the global overview in trade and transportation will offer a background insight on the target topic of this thesis.

During the past years, international trade has experienced a quick expanding period, with a sharp export increase from 3,675 billion US dollars in 1993 to 13,619 billion US dollars in 2007 (WTO, 2008, p.10).

More and more countries do trade with others, but the largest trade flows occur between Europe, North America and Asia/Pacific. Brazil, India and China are good examples to illustrate the role of emerging economy participating in the world trade. The growth of trade within regions shows a pronounced imbalance in some regions, for example, the “European Union with two-thirds of its trade transactions taking place within the region” (WTO, 2008, p.3).

Manufacturing goods are by far the most important category of traded goods, keeping its leading position over both agriculture and fuels and mining products. Exports of manufactures in 2007 are up to 9,499.5 billion US dollars, accounting for 70% of the world export (WTO, 2008, p.64).

By mode of transport, there is no doubt that water transport is the leader in terms of weight,
although air transport is gaining a rapid growth share in terms of value. And it is estimated that “the international shipping industry is responsible for the carriage of 90 per cent of world trade” (Soita, 2008).

2.2 Trade between China and Sweden

Sweden is regarded as illustrative in the case of world trade, as the “economy is highly internationally oriented due to Sweden’s small domestic market and the dominance of large manufacturing firms” (Woxenius, 2006, p.531). In 2007, 68% of goods produced in Sweden were exported, and exports contributed 52% of its GDP (Swedish Trade Council, 2007). Imports also played a vital role for the industry, and according to Swedish Federation of Trade, roughly 70% of Swedish imports were goods used for further manufacturing, assembling or investments in the industry in the year of 2006.

On the other side, China, with the rapid development for more than 20 years, has attracted the attentions of the whole world. And the status as an emerging power on the international scene has been recognized by more and more people.

The main trading partners of Sweden are located in Europe, like Germany, Norway and Denmark, although China is the biggest trading partner of Sweden in Asia. For China, EU is the biggest trading partner; however, the share of Sweden is quite limited. The following charts will offer a good illustration of the bilateral trade between China and Sweden.

**Chart 2.1: Sweden Traded with China in the Year of 2005, 2006 and 2007 (SEK Million)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Exports</th>
<th>Imports</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>18844378</td>
<td>1051995</td>
<td>17792383</td>
</tr>
<tr>
<td>2006</td>
<td>29695473</td>
<td>20712194</td>
<td>8983279</td>
</tr>
<tr>
<td>2007</td>
<td>36110018</td>
<td>22169514</td>
<td>13940504</td>
</tr>
</tbody>
</table>

*Source: Statistics Sweden
Note: Import figures refer to country of origin.*
Chart 2.2: Swedish Exports to China in the Year of 2005, 2006 and 2007 (SEK Million)

Source: Statistics Sweden

Chart 2.3: Swedish Imports from China in the Year of 2005, 2006 and 2007 (SEK Million)

Source: Statistics Sweden

Note: Import figures refer to country of origin.

Chart 2.4: Swedish Exports to China in the Year of 2005, 2006 and 2007:
Raw Material & Fuels (SEK Million)

Source: Statistics Sweden
From the tables, it is easy to see that engineering products have been the main goods traded between China and Sweden, and this industry has been the dominant industry in Sweden, with many well-known multinational corporations, like Ericsson and Volvo, which have already established their affiliates in China. What is more, the data from the Ministry of Commerce of China also confirms the above conclusion, and gives further information as following:

- On the side of Swedish exports to China, industrial goods, telecom equipment, mechanical equipment, have been the most important products, which have explained more than 50% Swedish exports to China in the year of 2007. Meanwhile iron, steel, vehicles and paper, chemical have also been the large product groups.

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5 Detailed information could be seen from Appendix B and Appendix C, and the English version has been provided.
On the side of Swedish imports from China, telecom equipment and mechanical equipment have made up more than 1/3 of the total imports in 2007. Furniture and consumer goods like clothes, shoes and sporting equipment have been the second and third large product groups.

When it turns to discuss the trend of China-Sweden trade, the founding is made by analyzing the above charts:

- Trade between China and Sweden has kept growing in recent years, both in import and export items. The position of China as an exporter to Sweden has been promoted. Chinese exports in engineering products have shown a rapid increase, and the same situation has also happened to other manufactures.

- Compared with Chinese exports, the growing rate of Swedish exports has been lower. There has been an obvious fluctuation of Swedish exports in raw material and fuels, up in 2006 and down in 2007. The growth of semi-manufactures exported to China has been steady, with the quick increase in iron and steel. Engineering products exported to China has been growing at a lower speed, and the share of telecommunications apparatus has dropped quickly. The situation has not been optimistic for the equipment for distr electricity as well.

2.3 Traffic Modes in China-Sweden Trade

Four types of traffic modes are common in transportation freight, each with its own advantage and disadvantage.

Transport by sea is an important role in international freight. It has the big advantage in providing cheap and high carrying capacity service, while with its disadvantage in long transport time and schedule affected by the weather factors.

Transport by air offers the delivery with speed, lower risk of damage, security, flexibility, and good frequency for regular destinations; however its disadvantage is high delivery fee.

Railway transport is regarded as environmental friendly. It provides high carrying capacity, and it has less influence by weather conditions. However, railway transport needs high cost of facilities and expensive maintenance, and meanwhile, the accessibility is also limited.
Transport by road has advantages as high accessibility, mobility and availability, with its disadvantages in low capacity, lower safety, and slow speed.

For the merchandise trade between China and Sweden, current transportation situation can be summarized as “a polarization to sea and air on opposite ends of the time, cost, and capacity scales” due to the significantly longer distance (Woxenius, 2006, p.539).

For China and Sweden trade, the traffic mode of sea transport dominates, and then air freight. Kinds of combination of sea and air offer diverse services in time and cost\(^6\). Other options, like container traffic using the TSR or the ECB as land bridges, and road transport caravans along the ancient Silk Road make little meaning to the current transport (Woxenius, 2006, p.540).

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\(^6\) Detailed information can be found in Appendix D.
CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

According to the different problem structures, mainly three types of research design can be distinguished: exploratory, descriptive and causal; and exploratory research deals with unstructured problem, while descriptive research and causal research deal with structured problem (Ghauri, 2005, p.57). When it comes to the skills required by exploratory research, “the key skill requirements in exploratory research are often the ability to observe, get information, and construct explanation that is theorizing” (Ghauri, 2005, p.58).

The purpose of this thesis is to offer a general picture of MNCs’ freight transportation activities in China-Sweden trade, and to explore the reasons by comparison with related theories, taking an example of trade between two countries, China and Sweden. Considering the nature of the problem and the type of the results which are expected to be produced, exploratory research is the one that fits this paper.

When it comes to the choice of research methods, qualitative or quantitative, the author should say that qualitative method is more appropriate in this case although some quantitative analysis is engaged in the paper, since the two methods are “not mutually exclusive” (Ghauri, 2005, p. 109). The author wants to get in-depth understanding in the given topic and to explore the reasons, and therefore a rational approach like qualitative method is needed. Additionally, the demand of samples in large number for quantitative method is not practical for this article.

Qualitative research emphasizes on understanding, while quantitative research emphasizes on testing and verification. Qualitative research is explorative orientation, while quantitative research is hypothetical-deductive. Qualitative methods focus on understanding from respondent’s/informant’s point of view, while quantitative methods focus on facts and/or reasons for social events (Ghauri, 2005, p. 110). Simply speaking, qualitative research investigates the why and how of decision making, as compared to what, where and when of quantitative research. Quantitative research requires large samples, while smaller but focused samples can satisfy qualitative research.
3.2 Data Collection

When conducting a research, it is very important to gather the data to answer the research questions. Data collection is classified into secondary data and primary data. “Secondary data are information collected by others for purposes that can be different from ours”, while “primary data are original data collected by us for the research problem at hand” (Ghauri, 2005, p. 91).

3.2.1 Secondary Data

According to Ghauri, several types of secondary data could be available (illustrated in figure 3.1).

*Figure 3.1: Types of Secondary Data*

- **Internal sources**
  - invoices
  - reports from different departments
  - warranties
  - complaints
  - brochures and catalogues

- **Published**
  - books and articles
  - general statistics
  - industry statistics
  - statistical bureaux
  - annual accounts
  - research reports

- **Commercial**
  - panel research
  - scanner research
  - monitors
  - in-shop research and reports


For this article, both internal sources (like annual reports and news on the official websites of different companies), and external sources (like information from Chinese and Swedish statistical bureaux, news from Chinese embassy in Sweden, and academic as well as professional journals) play an important role.

The data regarding the trade between China and Sweden, derived from Chinese Ministry of
Commerce and Statistics Sweden, has given the author a general outlook of cargo flow and structure of trade in commodities, which has been very useful to decide the industries and firms selected for interview.

The literature review is an economic and easy accessible source. It has assisted the author to be familiar with the research topic and benefited the author to map different factors in international freight transportation, which have supposed to be influential on the MNC-based trade.

What is more, the secondary data, to a large degree, has helped the author to decide the list of MNCs for interview. Information provided by the Swedish Chamber of Commerce in China made it possible to get a list of Swedish companies that have been developing business in China. Together with the information from Swedish Trade Council about Sweden’s 20 largest corporations by foreign sales in 2006\(^7\), then 12 Swedish companies have been considered to be selected for this research. From the website of Chinese Embassy in Sweden, 3 Chinese companies have been mentioned that they have been active players in the China-Sweden business, and they have come to the scope of the author’s study as well; finally just one for the interview since the other two did not think that they traded much commodities with Sweden.

What’s more, the official websites of different MNCs not only have provided necessary information to help the author to conduct telephone interviews with these companies, but also have become good supplementary information about the target companies.

The problem of disadvantages of secondary data, in this article, has also happened. For example, the statistics of imports and exports between China and Sweden are different according to different organizations, like Chinese Ministry of Commerce and Statistics Sweden. And such difference is very small reflected by number; therefore, this article thinks both of them are reliable and valid since the two organizations are quite authoritative and with neutral standpoint in the field.

3.2.2 Primary Data

Through the information gained from secondary data, there is still something missing, which

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\(^7\) See Appendix A.
needs the data gathered mainly for the intended purpose of the research and for the appropriate answers to the research questions.

According to Ghauri, the sources of primary data could be seen in the figure below:

![Figure 3.2: Sources of Primary Data](image)


The main advantage of primary data is that they are “more consistent” with the research questions and research objectives (Ghauri, 2005, p.102). The disadvantages of primary data come from many different aspects, since primary data is time-costly, difficult to get access and highly dependent on the willingness and ability of respondents and so on.

The risk on collecting cross-cultural data could also happen, since the complexity of environmental and contextual factors may impact the research. And two approaches, ‘emic’ approach and ‘etic’ approach are put forward to solve the problem.

Since previous knowledge on the topic which this thesis is dealing with, is quite missing, primary data have to be gathered using communication with the target objectives, which includes the use of both E-mail and phone interviews. Collecting primary data through these ways is thought to be able to find the up-to-date information on MNCs and to give a direct and clear answer to the
research questions.

The cross-cultural data has also been collected in this paper; however since the questions for telephone interview have been quite culture free, no much trouble has been generated for this research.

3.2.3 Interviews

Interview in the way of face-to-face verbal exchanges is considered appropriate for qualitative studies, through which the interviewer attempts to obtain information or opinions or beliefs from the interviewee (Ghauri, 2005, p.133).

For interview part of the article, the author hopes to get the information of the following two aspects:

- What is the general trade situation between China and Sweden of these MNCs?
- How about the transportation quality in China-Sweden freight in the eyes of these MNCs?

Then an interview guide has been drafted, to solve the above two questions. The following questions have been developed, in order to help to keep the interview on track. Although there have been some small changes to these questions, when facing different companies during the interviews, the following seven sets of questions have been the main content through all of the interviews conducted by the author with the.

1) For your group, is there any goods shipped between China and Sweden currently? If yes, how about the direction of the trade flows? And if you trade in two directions, how about the split for each direction?

2) What types of the goods traded for your group in China-Sweden line? Are they finished goods or components?

3) Does your group have foreign affiliates or overseas offices or other organizations in China/Sweden? If so, how about the function of them?

4) When the China-Sweden bilateral trade occurs in your group, is it arm-lengths trade or intra-firm trade?
5) For your group, what is/are the transport mode(s) for present use when doing the trade between China and Sweden?

6) What important transportation attribute(s) do you concern in the trade between China and Sweden?

7) For the trade between China and Sweden, your group buys the transport service or your company has your own fleet? If your group buys the transport service, which part (Chinese part or Swedish part) decides the purchase of the freight service?

Question 1 has been constructed to get the general idea of the trade. The author has distinguished the two different directions of the trade.

Question 2 has been developed to find out the further usage of the goods shipped, for final customers or for manufacturing.

Questions 3 and 4 have been constructed to know the relationship between these MNCs and their foreign affiliates and their trading activity.

Questions 5 to question 7 have been developed to get these MNCs’ opinions on transportation in the trade.

Question 5 has been designed to know the choice on transport mode.

Question 6 has been aimed to get the enterprise’s views on their requirements on transport quality.

Question 7 has been constructed to find out the decision right to purchase transport service.

Generally speaking, the questions designed for the interview were unstructured, since there were no predetermined answers. For the exploratory nature of this study, there must be enough room left for the interviewees, and this research design will allow the interviewees to speak their own ideas, in order to have more useful findings for this research. Ghauri has had the same view, and he has thought that “unstructured interviews we often obtain information about personal, attitudinal and value-laden material” (Ghauri, 2005, p.132).

When the questions have been determined, the next step would be to see who could be able to provide this information. With the help of EWTC people, and due to the firm culture of Swedish rooted enterprises, the author has got the access to people working in logistics department of these MNCs.
Since the number of target companies was not big, the pilot study was expected to do with some affiliates of Swedish rooted MNCs during the summer of 2007; however, the results were very disappointed, and the author found nothing from the pilot studies. Therefore, the timing for the first interviewee was set up as an example for the next, and each of the telephone interviews took around 20 to 30 minutes.

On how to record information, this research did not use the tape-recording. Although it is a useful method, considering the disadvantages it may lead to, note taking has been the only way used for information recording in this thesis.

### 3.3 Data Analysis

The interpretation of the data which have been collected through the interviews and the analysis will be seen in Chapter Four and Chapter Six of this thesis.

The comparison of the results of this investigation with the theoretical information and secondary data will be conducted in Chapter Five and Chapter Six of this article.
CHAPTER FOUR: LITERATURE REVIEW

According to the author’s understanding, the MNC’s activities in international transportation mainly include their decisions on types of goods moved, volume in trade, origin and destination, choice on modes, and the quality requirements on transportation service. The first three have a close relationship with trade theory, since the core subjects of trade theory are the pattern and volume of trade: which goods are traded by which countries, and how much of those goods are traded. And the latter two are the main concerns of freight demand. Therefore, in this chapter, the literature reviews refer to two aspects: theories on international trade and freight demand. The emphasis on MNCs’ perspectives will be given to each aspect.

4.1 International Trade

4.1.1 Brief Review of International Trade Theories

Researches on trade theories can be widely found among literature. The development process of the international trade theories can be generally divided into two stages, “old” theory of international trade and “new” theory of international trade (Bernard, Jensen, Redding and Schott, 2007, p. 2).

Ricardo, Heckscher and Ohlin are believed to be the representative researchers for “old” theory (Bernard, et al., 2007, p.2). Comparative advantage is the central concept for “old” theories to explain goods flow across countries and across industries and it “can arise because of productivity differences (‘Ricardian’ comparative advantage) or because of a combination of cross-industry differences in factor intensity and cross-country differences in factor abundance (‘Heckscher-Ohlin’ comparative advantage)” (Bernard, et al., 2007, p.2). And these factors can be labor, capital, technology, and so on.

Krugman, Helpman and Ethier can be viewed as the leaders on the study of “new” trade theory (Bernard, et al., 2007, p.3). Compared with “old” trade theory, the new theory believes that welfare can be gained from “wider set of varieties that trade makes available to consumers”, rather than from “the differences in opportunity costs of production across industries and countries” (Bernard, et al., 2007, p.3). It means that the factors like increasing returns to scale and consumer
love of variety replacing the difference in endowment across industries and countries, become the
main driving force for international trade. From then, a shift has come, and the international trade
researches become to put attentions on the studies of firms and products, unlike the previous work
limited to countries and industries.

In new theory, four possible factors can be used to explain the growth of world trade. The first is
trade liberalization, and the second is falling transportation costs. The third is that trade has grown
because economies have converged in economic size. And Krugman offers the fourth explanation,
“slicing up the value chain”. “A good that is produced in one country may be assembled from
components produced in other countries, and these in turn may be assembled from subcomponents
produced in yet other countries. As a result, the trade involved in the global production of a final
good may easily be several times the value added in all stages of that production” (Krugman, 1995,
p.329). This phenomenon is also called fragmentation, multistage production, disintegration of
production and vertical specialization.

The “gravity model” in trade theory is usually applied to explain the volume of trade. “Early
research on the gravity equation supposed that the aggregate value of trade between a pair of
countries was proportional to the product of their incomes and inversely related to the distance
between them”; however, “subsequent research has considered a wide range of other variables that
may influence bilateral trade and developed micro-foundations” (Bernard, et al., 2007, p.11).

4.1.2 MNCs in International Trade

In the author’s opinion, although both old and new trade theory and gravity model have
successfully explained many economic phenomena emerging in the field of international trade,
there is something missing about the discussion of firm’s role in the implications of international
trade. And it is firm that actually drives trade flows. Additionally, concerning MNCs, who are the
important players in the international trade, a study on MNCs’ characteristics and strategies could
imply a channel for the further study on international trade. The systematic research has not been
well established on this topic; however, the previous studies collected in this thesis can still offer
us some interesting insights.
4.1.2.1 Types of MNC-based Trade

MNC-based international trade comes in two forms, arms-length trade and intra-firm trade. The former are shipments between a division of an MNC and unaffiliated buyers/suppliers in other countries, while the latter are internal shipments between an MNC parent and its foreign affiliates.

Arms-length trade is the most common way of all types of trade; however, intra-firm trade has been thought to take the main share of MNCs` trade in the empirical studies of some developed countries. And the intra-firm trade has a close connection with vertical-specialization-based trade of MNCs. The difference lies in that the latter only refers to intermediate goods for trade, and that the former is not limited.

Therefore, theoretically, the MNC-based trade can utilize four trade flows, arms-length imports and exports and the two intra-firm flows of goods. As a result, the business linkages developed by the MNC-based trade are MNC-customer, MNC-supplier, and MNC parent-foreign affiliates.

Although the researches on determinants of international trade have always been done on industry and country level, some previous studies still provide valuable information about the determinants of the share of intra-firm trade. Antrás (2003) pointed out that the inputs provide by the parent firm was one determinant, which was strongly confirmed by Yeaple (2006) and Nunn and Trefler (2007).

4.1.2.2 MNCs’ Strategies and Roles of Affiliates

In common, strategies exist at three levels in an organization, corporate-level strategy, business-level strategy and strategy of a strategic business unit. “Corporate-level strategy is concerned with the overall purpose and scope of an organisation and how value will be added to the different parts (business units) of the organization; business-level strategy is about how to compete successfully in particular markets; and a strategic business unit is a part of an organisation for which there is a distinct external market for goods or services that is different from another strategic business unit” (Johnson, Scholes and Whittington, 2006, p. 11).

“Corporate strategy is concerned with decisions of the corporate parent about the product and international scope; and how they seek to add value to that created by their business units”
(Johnson, et al., 2006, p. 329). Usually, two forms of strategies are common to see about the international strategy for corporate, vertical integration and horizontal integration. The former is “backward or forward integration into adjacent activities in the value network”, while the latter is “development into activities which are complementary to present activities” (Johnson, et al., 2006, p. 285). For vertical integration, expansion of activities downstream is referred to as forward integration, and expansion upstream is referred to as backward integration. “Vertical” multinationals are inclined to locate their single plant and headquarters in different countries depending on factor prices and market sizes. And “horizontal” multinationals are inclined to have plants producing the final good in multiple countries.

For MNCs, the key strategic issues are “structure and control at the corporate level and relationships between businesses and the corporate parent”, since the diversity existing in both products and geographical markets within a MNC (Johnson, et al., 2006, p. 23). The multinational parent company allocates resources to its different corporate business units, and does the coordination jobs, among which the “coordination of operational logistics across different business units and different countries may become especially important” (Johnson, et al., 2006, p. 23). Accordingly, the roles of MNCs’ affiliates may be different, because they are derived from the strategies of multinational corporates, in the author’s opinion. A three-fold typology of subsidiary roles, which agrees with the author’s idea, has been put forward by Birkinshaw and Morrison. According to their research, the roles of subsidiary refer to local implementer, specialized contributor, and world mandate.

The local implementer refers to the subsidiary that has “limited geographic scope, typically a single country, and severely constrained product or value-added scope” (Birkinshaw and Morrison, 1995, p. 732). In this case, the role of the subsidiary is to provide their products, just to satisfy the local needs.

The subsidiary acting as a specialized contributor must have “considerable expertise in certain specific functions or activities”, but its activities are “tightly coordinated with the activities of other subsidiaries” (Birkinshaw and Morrison, 1995, p. 732). Subsidiaries of this type are involved in a narrow set of value activities, and have close connections with some other subsidiaries.
The subsidiary being the type of the world mandate “works with headquarters to develop and implement strategy” (Roth and Morrison, 1992, p. 716). “The subsidiary has worldwide or regional responsibility for a product line or entire business, and typically has unconstrained product scope and broad value-added scope” (Birkinshaw and Morrison, 1995, p. 733).

4.2 Related Studies on Freight Transportation

4.2.1 Factors Influencing on Freight Demand

“The demand for freight transportation is derived from the customer demand for product”, (Coyle, Bardi, and Novack, 1994, p. 34). The analysis of commodity transportation demand can be taken by three basic approaches: the input-output approach, spatial interaction modeling and the enterprise perspective. This paper will follow the third approach, the enterprise perspective.

In the author’s opinion, the demand for freight transportation reflects two things. One is the market’s demand for the products made by a firm; and the other is a firm’s usage of freight transportation as an input to its production or distribution process. The two things are systematically correlated with firms, since a firm is the most active and important unit in today’s fast-changing business. It is the firm’s decision of foreign markets to serve, products to export and offshore outsource. Therefore, this study believes that to capture the characteristics of freight demand at the firm level will produce a good result of what has really happened and what may happen in the future on this field.

The study on freight demand characteristics needs classification of factors influencing the demand, because there are so many elements and variables related. Among previous researches, some researchers have left some good suggestions, although they used their ways of classification with different purposes for their studies.

Jiang, Johnson, and Calzada (1999) divided available freight demand characteristics into three types: a firm’s (shipper’s or receiver’s) characteristics, goods’ physical attributes, and the spatial and flow characteristics of shipments.

According to their research, “a firm’s characteristics include the nature of the firm (factories,
shopping centers, or warehouses), the firm’s structure (small, nationwide or world wide), the firm’s location (the accessibility to rail branch lines and highways), the firm’s size represented by the number of employees, the firm’s own transportation facilities and the firm’s information system” (Jiang, Johnson, and Calzada, 1999, p. 150).

Goods` physical attributes referred to the attributes of the goods to be transported, such as type of products, weight, value, and packaging. The type of product included a wide range of categories, for example, foodstuffs and fodder, machines and metal articles, transportation and agricultural materials. Generally, packaging meant parcels and pallets or tanks, containers, and cases (Jiang et al., 1999, p. 150).

Finally, frequency, distance, origin, and destination of a shipment made up the spatial distribution and physical flow attributes (Jiang et al., 1999, p. 150).

Additionally, Jiang et al. thought that all of these characteristics can be either long term factors or short term factors, since changes in these characteristics were made at different levels. The long term factors, which were believed to be made at strategic level, included the firm’s nature, size, location, information system, structure, and trucks owned by the firm; while the short term factors, which were believed to be made at day-to-day decision making level according to market demand, included physical attributes of goods, physical flow attributes, and the spatial distribution characteristics of shipments (Jiang et al., 1999, p. 150).

Evers and Johnson categorized these factors into six main groups, namely: customer requirements, product characteristics, company structure or organization, government interventions, available transport facilities and perceptions of the decision-maker him or herself (Evers and Johnson, 2000, p. 28). And they highlighted the influence of the level, composition and geographical distribution of production and consumption activities on the demand for freight transport.

JE Fernández L, J de Cea Ch and AS O classified the shippers` considerations into the following categories:

1) Product transported. It was assumed that the characteristics of the product transported strongly influenced the transportation decisions taken by the shipper.
2) Commercial position. It was thought that different criteria would be used to take decisions related to spatial product distribution if the shipper was a buyer (at destination) or a seller (at the origin) of the product to be distributed.

3) Trade type. It was assumed that the influence of factors affecting transportation services consumption would be different if the product was being exported, imported or internally traded.

4) Shipment size. Negotiation power and conditions obtained for transporting the products would be generally influenced by the size of the shipments.

5) Fleet ownership. The fact that a shipper had his own private fleet would also importantly influence the transportation decisions; and this would require treating separately to shippers that were in such position. (JE Fernández L, J de Cea Ch and AS O, 2003, p. 618)

In the author`s opinion, the previous literate has offered rich results for the classification work. However, for the topic this thesis is dealing with, some modifications should be made with the previous work, in order to get a better application for this paper. Here, the author believes the classification of Jiang et al. is the best one. Additionally, in the author`s pinion, firm`s characteristics need include firm`s commercial position and firm`s relationship with customer. What`s more, regarding physical attributes of goods, physical flow attributes, and the spatial distribution characteristics of shipments, it is not a good treatment, if categorizing them into short-term factors, since this paper believes that the import and export activities of MNCs may have close relationship with their corporate strategy, not only day-to-day decision.

To sum up, for the MNC-based China-Sweden trade flows, the following factors will be given more attentions to: MNCs` (or its foreign affiliates`) nature, MNCs` relationship with its foreign affiliates, MNCs` (or its foreign affiliates`) commercial positions, MNCs` (or its foreign affiliates`) relationship with customer, goods` physical attributes (type of products, weight, value), and things related to policy.

4.2.2 Key Attributes of Transportation

The expectations of shipper or consignee for transport service are continuing to rise, and such
growing demands for increased levels of service can be translated into more, better, and faster, for short. Shippers’ requirements on the service can be reflected not only by the economic attributes of transportation (time and cost), but also by more qualitative factors. Therefore, the study on the combination of these attributes will give us a better understanding of shippers’ demand.

The question of “what is transportation quality” has been answered empirically as early as in 1989. And according to a survey conducted by Traffic Management, shippers had definite opinions about what constituted quality performance from a carrier. In this research, on-time pickup and delivery, competitive rates, dependable (or good) service, damage-free delivery and carrier attitude and responsiveness had been listed on top 5 to define the specifics of transportation quality (Brewda, Britt, and Delan, 1989, p. 39). Both general and specific definitions of quality are contained for this question, and it may be due to the complexity of the transportation service itself and its interconnections with shippers’ perception.

Today, time and cost are the two crucial attributes of transportation, and additionally, “shippers’ demands for freight have varying service requirements of transport providers ranging from specific pickup times to equipment and communication, and the transportation service characteristics of freight shippers include transit time, reliability, accessibility, capability, and security” (Coyle, et al., 1994, p.36). According to the author’s understanding, “reliability” in Coyle’s description is quite similar to “on-time pickup and delivery” in the survey conducted by Traffic Management, and “damage-free delivery” is almost equal to “security”.

Although it is usually hard to quantify the qualitative factors, there are some techniques existing that can help to understand the attributes of freight transportation. Among these techniques, stated preference design is the common tool for research, and with the development, computers have been introduced to help to produce an accurate result. Employing this method, many researchers have identified key attributes of transportation service, namely price, time, reliability, frequency, security, flexibility (Shinghal and Fowkes, 2002; Bolis and Maggi, 2003; Bergantino and Bolis, 2004; Danielis, Marcucci, Rotaris, 2005).
CHAPTER FIVE: INTERVIEWS WITH MNCs

5.1 Corporate Information and Data Representation

5.1.1 ABB

ABB is a leader in power and automation technologies. For ABB China, it has a full range of business activities in China, including R&D, manufacturing, sales and service. Currently, over 90% of ABB’s businesses in China have been carried out with locally-originated products and services. More information about the company can be found at http://www.abb.com/.

5.1.2 Electrolux

AB Electrolux is a world leading producer of appliances and equipment for kitchen and cleaning. The Group’s largest markets are in Europe and North America. At present, Electrolux has two factories located in China, and Electrolux China was still unprofitable in 2007. However, China has played an important role under the framework of Electrolux global outsource; for example, about two-thirds of the production of Electrolux vacuum cleaners were supplied by producers in China in 2007. More information about the company can be found at http://www.electrolux.com/.

Serena Li with the position of Transport Business Analyst in the department of Corporate Purchasing accepted the interview in Nov. 2007.

Regarding the bilateral trade flows, Electrolux mainly imported components from China to Sweden. Electrolux thought the exports from China to Sweden would be decreased in the future since they were facing the pressure coming from the increasingly high China-Sweden transport fee, due to the increased transport cost caused by oil and the difficulty made by long distance. Therefore, they would put more considerations on suppliers among European countries.

Regarding the trade partners in China, both Electrolux China factories and other factories in China supplied goods for Electrolux, and China was thought to be one of the major suppliers to the group; additionally, the two factories of Electrolux, located in China, were mainly functioned as serving the local market. What’s more, the unsuccessful performance of Electrolux in China was believed

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8 Here, the author means the time for the interview with Electrolux in Nov.2007.
to be related to the failure of marketing strategy in the recent years.

On the transport mode choice, Electrolux said that the majority of the imports from China to Sweden were done by sea, and air freight was taken as a solution for the emergency case. Electrolux thought reliability and price were their main concerns on the transportation attributes for China-Sweden trade.

5.1.3 Ericsson

Ericsson is a world-leading provider of telecommunications equipment and related services to mobile and fixed network operators globally. China has been one of the most important markets for Ericsson. From 2002, China has been to one of the top three product suppliers. China is not only a manufacturing base for Ericsson, but also one of the four established R&D centres in the world for the group. In 2007, China became the first largest market for Ericsson. More information about the company can be found at http://www.ericsson.com/.

Leif Hellström, working with Strategy & Development in the department of Global Distribution Logistics accepted the interview in Nov. 2007.

Regarding the bilateral trade flows, Ericsson stated that their imports from China were more than their exports to China. China was the second largest supplier for Ericsson, but the consumption capacity was limited, just a share of 7.5% among total consumption market. The imports for Ericsson from China to Sweden were mainly made up by finished goods with high value, and they exported both finished goods and components to China. Ericsson predicted that there would be a decreased trend in Chinese exports to Sweden, mainly because increasing proportion of the finished goods would be shipped directly from China to the final customer, instead of transiting through Sweden.

Ericsson China was a main production base for the group, and it served for other countries rather than Sweden.

On the transport mode choice, Ericsson explained the reason they chose the air freight as the major tool for transportation that they emphasized on the lead time which could be achieved by air flight only. At the same time, they said that since the mode was via airplane, the reliability could
certainly be obtained. And they thought shortage of capacity was the main negative aspect when using air freight. In the last year or so, however, an increasing proportion of the goods were being sent by sea freight when possible, for cost reasons.

5.1.4 H&M

H&M is the biggest sales enterprises in garment industry in Sweden. TOP AccessoH&M does not own factories of its own. Instead, their products are produced by around 700 independent suppliers, primarily in Asia and Europe. And Germany is the biggest market for H&M, followed by the UK and Sweden. China is one of the most important suppliers to H&M. More information about the company can be found at http://www.hm.com .

Erik Nauclér, the Shipping Manager accepted the interview in Sep. 2007.

Regarding the bilateral trade flows, exports from China to Sweden were the main trade flows. H&M shops newly opened in China followed the pattern which was exactly the same of all the H&M shops in the world. However, the number of the shops in China was very small. H&M explained that it was hard to predict the trade flows in the future, due to some changing factors in target countries. For example, customs rulers would influence their plan for purchase.

H&M’s suppliers in China were mainly located in the eastern part of China.

On the transport mode choice, H&M used sea freight for more than 90% exports from China to Sweden, and air freight used for the rest 10% in case of emergency. H&M highlighted reliability, and departure time came secondly; besides, they also mentioned other transportation attributes, like environmental friendly transport, cost and safety.

5.1.5 IKEA

IKEA is a privately-held, international home products retailer that sells low-price products, including furniture, accessories, bathrooms and kitchens at retail stores around the world. According to the report of IKEA financial year 2008, among the top five purchasing countries for IKEA, China ranked the first with the share 21%. More information about the company can be found at http://www.ikea.com/.

Xing Zhao, the Business Navigation Manager of Transport Asia Pacific, accepted the interview in
Nov. 2008. Regarding the bilateral trade flows, IKEA said that China was their biggest single purchase country, but a small sales country. However, they believed that China would continue to grow in both sales and production. IKEA outsourced finished goods from many Chinese suppliers. IKEA mentioned that their purchase from China was decided by the arrangement of the headquarters. Many factors including the price of raw material, labour cost, and the operation cost in China had been taken into the comprehensive consideration for their trade with China. On the transport mode choice, IKEA mainly used sea freight for goods to move from China to Sweden. Price, reliability, lead time, all of them were the key factors for IKEA’s concerns on transportation.

5.1.6 Sandvik

Sandvik is a high-technology, engineering group. Sandvik has come to China more than 20 years ago. Six manufacturing bases have been established in China. In 2007, China continued to show strong growth for its fast development in construction industry. And China was among one of the 10 largest markets by invoiced sales in Sandvik, with a significant increase of 21% compared to the last year. More information about the company can be found at http://www.sandvik.com/.

Joakim Lindstrom, the Shipping Planning Manager, accepted the interview in Nov. 2007.

Regarding the bilateral trade flows, Sandvik stated that they rarely imported from China, but exported steel and machinery to Sandvik China instead. And Sandvik China mainly served Chinese market, due to the strong demand locally.

On the transport mode choice, Sandvik said that 85% exports from Sweden to China were moved by sea, and air freight for the rest 15% in case of emergency. Price was the main concern when they chose the transport service.

5.1.7 SCA

SCA is a global consumer goods and paper company. They develop, produce and market personal care products, tissue, packaging solutions, publication papers and solid-wood products. Europe and North America are the main markets for SCA; however, the fast development of Chinese market, with growth in double digits in 2007, has made SCA to given the strategic priority to.
More information about the company can be found at http://www.sca.com/en/Home/.

Alexander Nikolic, the Director M&A Projects of SCA Asia Pacific, accepted the interview in Nov. 2007.

About the trade flows, SCA said that there were very little goods shipped between China and Sweden. And they operated in a business where SCA produced and sold locally in China. SCA said that they eyed Chinese market due to its high growth rates. And because of the attributes of their service and products, they need to be close to the final customers.

5.1.8 Scania

Scania is a leading manufacturer of heavy trucks and buses as well as industrial and marine engines. The company also markets and sells a broad range of service-related products and financing services. More information about the company can be found at http://www.scania.com/.

Hans-Åke Danielsson, the Press Manager of Scania, accepted the interview in Nov. 2007.

Currently, there were no direct trade flows between China and Sweden. The explanation from Scania was that the machine produced by their European firms was not suitable for Chinese market, and that their firms in South America served Chinese market, which just accounted for a small share of Scania`s productions.

5.1.9 Sony Ericsson

Sony Ericsson, a half to half joint venture of Sony Corporation and Telefonaktiebolaget LM Ericsson, was established in October 2001. China is Sony Ericsson's sole strategic development base whose business covers design, manufacturing, sourcing, research and development, as well as global sales and marketing. More information about the company can be found at http://www.sonyericsson.com/cws.

Magnus Öhnedal, the Logistics Manager, accepted the interview in Nov. 2007.

Regarding the bilateral trade flows, Sony Ericsson said that they mainly imported finished goods from China to Sweden. In regard to Sony Ericsson, majority of all phones sold have been made in

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9 After that the author has finished the interview, Scania has in fact started to trade some automotive components from China.
China. However, the growing trend of Chinese exports to Sweden was being challenged heavily by the manufacture from other countries like India and Vietnam, because the overall cost in China was expected to increase gradually.

Regarding the trade partners in China, both their own factories and other outsource partners shipped the products to Sony Ericsson Sweden. The availability of engineers and operators at low cost was the main advantage for Sony Ericsson to do business in China.

On the transport mode choice, the exports from China to Sweden chose shipment by air for more than 90% of their products, since these high value goods needed the high-degree security.

5.1.10 Tetra Pak

Tetra Pak is a world leading company in food processing and packaging. China has been a significantly growing market for Tetra Pak in recent years. More information about the company can be found at http://www.tetrapak.com/.

Christel Daudi with the position of Global Purchase Professor accepted the interview in Oct. 2007.

Regarding the bilateral trade flows, Tetra Pak mainly exported raw materials (e.g. paperboard, alufoil and polymers) to China, for the production of their factories in China.

Tetra Pak chose to transport their goods from Sweden to China, mainly by sea, and reliability was believed to be an important concern on transportation attributes.

Tetra Pak mentioned that the huge market potential of China was the driving motivation for their factories established in China to satisfy the local needs.

5.1.11 Volvo Construction Equipment

Volvo Construction Equipment is a subsidiary and business area of AB Volvo. Volvo Construction Equipment develops, manufactures and markets equipment for the construction and related industries. Volvo Construction Equipment has production facilities in Europe, Asia, North America, and South America. The company offers worldwide service and spare-part distribution as well as a wide range of attachments.

Mats Olofsson, in the Volvo Construction Equipment Logistics department, accepted the interview
in Nov. 2007.

In just a few years, Volvo Construction Equipment established very strong presence on the Chinese construction equipment market, and was expanding rapidly. However, the share of sales in Chinese market was still very small of the total. More information about the company can be found at http://www.volvo.com/group/global/en-gb.

On the bilateral trade, Volvo Construction Equipment mainly exported their products (finished goods) to China, in order to meet the local needs in China. The majority of their suppliers were located in Europe, partly because of the shorter transport distance, compared with supply from China. However, the sales in China were believed to be a continued growth since the big market potential existed in China.

They moved their goods from Sweden to China, only by sea, since the heavy weight of these exports. Reliability and lead time were considered to be the key factors on transportation attributes.

5.1.12 Huawei

Huawei Technologies is a leader in providing next generation telecommunications networks, and now serves 35 of the world's top 50 operators, along with over one billion users worldwide. For Huawei, one of its five foreign R&D centres is located in Stockholm, Sweden. In recent years, Huawei’s overseas sales have exceeded its domestic sales, with the highest percentage of 72% in 2007. More information about the company can be found at http://www.huawei.com/.

Du Tao, the Logistics Manager of Huawei in Sweden accepted the interview in Nov. 2007.

In regard to the bilateral trade, they just shipped their products from China to Sweden. And among these finished goods, more than 90% were from Huawei China. Although Sweden was small both in size and population, the demand for telecommunication products driven by the developed machinery manufacturing industry in Sweden provided the good chance for Huawei to enter this market.

On transport mode choice, 50% of the total goods were shipped by sea, and the rest 50% were transported by air. Lead time and reliability were thought to be the main concerns on
transportation attributes.

Additionally, Huawei pointed out that the purchase of transport service was decided mainly by their customers in Sweden. And Huawei was working hard to be a fast respondent to their customers in every aspect of their business.

5.1.13 Qingdao Pacific Container Co., Ltd.

Strategically located in the Economic & Technological Development Zone of Qingdao, Qingdao pacific Container Co., Ltd. was formed by Singamas in Singapore and Hiking Group Co., Ltd., the largest foreign trade group in the Shandong Province in China. This joint venture company produces conventional dry freight containers as well as specialized containers. In the year of 2006, Qingdao Pacific Container Co., Ltd. was the biggest exporter to Sweden in Qingdao City, with the trade worth 15 million US dollars. More information about the company can be found at http://www.singamas.com/PageEng/Company/company.html.

Manager Wang in Qingdao Pacific Container Co., Ltd. accepted the interview in Nov. 2007.

This company only sold their containers from China to Sweden. They stated that Sweden was not their main markets, and that their biggest competitor, another Chinese company dominated this market, putting great pressure on their business. They got the order from Sweden at present, but they were not sure about the future.

Qingdao Pacific Container Co., Ltd said that about 1/3 of their exports to Sweden were done with a big Swedish customer, and that the rest 2/3 were traded with many other small orders.

On the transport mode, they sent containers to Sweden only by sea, due to the big size of their products. As a small-size enterprise in container manufacturing industry in China, they were sensitive to cost, and even sometimes they chose to cut down cost by avoiding the peak time for shipment, but at the cost of delayed time for delivery.

5.2 Summary of the Information from Interviews

For clear expression, this part will present the information obtained from the interviews in the form of tables and charts.
The Table 5.1 will classify the MNCs according to the types of goods traded between China and Sweden.

Chart 5.1 will give a brief illustration of the bilateral trade between China and Sweden, driven by the MNCs. And chart 5.2 will introduce the transport mode chosen by the MNCs and their concerns on transportation attributes. Since SCA did little China-Sweden trade, and Scania did not do trade between China and Sweden, and there was some data mistake with ABB; therefore the charts coming later will not include them.

**Table 5.1: MNCs Classified by Types of Goods Traded**

<table>
<thead>
<tr>
<th>Goods for Trade</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel</td>
<td>Sandvik</td>
</tr>
<tr>
<td>Paper and board</td>
<td>SCA; Tetra Pak</td>
</tr>
<tr>
<td>Engineering products</td>
<td>ABB; Electrolux; Ericsson; Scania; Sony Ericsson; Volvo Construction Equipment; Huawei; Qingdao Pacific Container Co., Ltd.</td>
</tr>
<tr>
<td>Clothing</td>
<td>H&amp;M</td>
</tr>
<tr>
<td>Furniture</td>
<td>IKEA</td>
</tr>
</tbody>
</table>

*Source:* the author’s interpretation
Chart 5.1: Import and Export between China and Sweden of the MNCs

<table>
<thead>
<tr>
<th>Company</th>
<th>China</th>
<th>Sweden</th>
<th>Percentage</th>
<th>Types of goods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrolux</td>
<td></td>
<td></td>
<td>Majority</td>
<td>Components (mainly)</td>
</tr>
<tr>
<td>Ericsson</td>
<td></td>
<td></td>
<td>Majority</td>
<td>Finished goods</td>
</tr>
<tr>
<td>H&amp;M</td>
<td></td>
<td></td>
<td>Majority</td>
<td>Finished goods</td>
</tr>
<tr>
<td>IKEA</td>
<td></td>
<td></td>
<td>Majority</td>
<td>Finished goods</td>
</tr>
<tr>
<td>Sandvik</td>
<td></td>
<td></td>
<td>Majority</td>
<td>Steel</td>
</tr>
<tr>
<td>Sony Ericsson</td>
<td></td>
<td></td>
<td>Majority</td>
<td>Finished goods</td>
</tr>
<tr>
<td>Tetra Pak</td>
<td></td>
<td></td>
<td>Majority</td>
<td>Components</td>
</tr>
<tr>
<td>Volvo Construction Equipment</td>
<td></td>
<td></td>
<td>Majority</td>
<td>Finished goods</td>
</tr>
<tr>
<td>Huawei</td>
<td></td>
<td></td>
<td>Majority</td>
<td>Finished goods</td>
</tr>
<tr>
<td>Qingdao Pacific Container Co., Ltd</td>
<td></td>
<td></td>
<td>100%</td>
<td>Finished goods</td>
</tr>
</tbody>
</table>

Source: the author’s interpretation from the interviews

Note: (1) The sign of arrowhead in the second column represents the direction of goods flow.

(2) In the third column, since interviewed companies did not give the author clear number but qualitative description of the trade, the word “majority” is a treatment in this thesis work. Here majority means the percentage ranging from 70% to 100% according to the author’s understanding.

(3) The percentage is according to the value of the whole goods for trade.
<table>
<thead>
<tr>
<th>Company</th>
<th>China</th>
<th>Sweden</th>
<th>Types of goods</th>
<th>Transport mode</th>
<th>Key transportation Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrolux</td>
<td></td>
<td></td>
<td>Components (mainly)</td>
<td>Mainly by sea</td>
<td>Reliability &amp; Price</td>
</tr>
<tr>
<td>Ericsson</td>
<td></td>
<td></td>
<td>Finished goods</td>
<td>Mainly by air</td>
<td>Lead time &amp; Reliability</td>
</tr>
<tr>
<td>H&amp;M</td>
<td></td>
<td></td>
<td>Finished goods</td>
<td>90% by sea</td>
<td>Reliability &amp; Departure time</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10% by air</td>
<td></td>
</tr>
<tr>
<td>IKEA</td>
<td></td>
<td></td>
<td>Finished goods</td>
<td>Mainly by sea</td>
<td>Price &amp; Reliability &amp; Lead time</td>
</tr>
<tr>
<td>Sandvik</td>
<td></td>
<td></td>
<td>Steel</td>
<td>85% by sea</td>
<td>Price</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15% by air</td>
<td></td>
</tr>
<tr>
<td>Sony Ericsson</td>
<td></td>
<td></td>
<td>Finished goods</td>
<td>90% by air</td>
<td>Security</td>
</tr>
<tr>
<td>Tetra Pak</td>
<td></td>
<td></td>
<td>Components</td>
<td>90% by sea</td>
<td>Reliability</td>
</tr>
<tr>
<td>Volvo Construction</td>
<td></td>
<td></td>
<td>Finished goods</td>
<td>100% by sea</td>
<td>Reliability</td>
</tr>
<tr>
<td>Equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Huawei</td>
<td></td>
<td></td>
<td>Finished goods</td>
<td>50% by sea</td>
<td>Lead time &amp; Reliability</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50% by air</td>
<td></td>
</tr>
<tr>
<td>Qingdao Pacific</td>
<td></td>
<td></td>
<td>Finished goods</td>
<td>100% by sea</td>
<td>Price</td>
</tr>
<tr>
<td>Container Co., Ltd.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: the author’s interpretation from the interviews

Note: the explanation of this table is the same with chart 4.1.

Except Qingdao Pacific Container Co., Ltd., all of the MNCs interviewed had their subsidiaries or sub-organizations in China (or Sweden), and admitted that their trade activity and the functions of their Chinese (or Swedish) subsidiaries were arranged or decided by their headquarters. Electrolux China factories were dedicated to serve the local market in China or other Asia Pacific countries, and the same with Sandvik China, SCA China, Tetra Pak China and Volvo Construction Equipment China. Ericsson China and Sony Ericsson China were not only production bases for the local market in China, but also serving for their whole group. Additionally, H&M, IKEA set up their outsourcing office in China for their purchasing activity. Scania had their own sales offices or
related organizations in China, and Huawei had its own sales offices and R&D centre in Sweden.

On the question whether these MNCs’ subsidiaries or other companies were the main partners for trade, answers were different. Electrolux mainly outsourced from companies in China, but not trading in-house, and the same with H&M and IKEA. Ericsson China and Sony Ericsson China sold the finished goods to Swedish market. Sandvik and Tetra Pak mainly exported components to their factories in China, for the production of their Chinese factories. Volvo Construction Equipment sold their products to their Chinese customers. Huawei and Qingdao Pacific Container Co., Ltd. sold the goods to their Swedish customers.

All of the interviewed companies did not have their own fleet, and they bought the transport service. No matter Swedish part as a buyer or seller, the decision right of the purchase of transport service was always on Swedish side, although some of the corporations left a little room for their Chinese partners.
CHAPTER SIX: ANALYSIS OF RESULTS

The author wants to offer a general picture of MNCs` freight transportation activities in China-Sweden trade, and to explore the reasons by comparison with related theories. In this chapter, a brief summary of the MNCs’ transportation activities in China-Sweden trade will be given, and subsequently, the relationship between previous researches on international trade and freight demand and the behaviors of MNCs in international freight transportation in this study will be analyzed.

6.1 MNCs` Transportation Activities

1) Volume. Generally speaking, for the MNCs interviewed, more firms moved goods from China to Sweden than the opposite direction, which is consistent with the fact that China exports much more goods to Sweden than China’s imports from Sweden in recent years. Among the 10 MNCs interviewed, 3 companies exported from Sweden to China. Specifically, Volvo Construction Equipment sold their products to Chinese customers, while Sandvik and Tetra Pak outputed their goods for the further production taken in their affiliated factories in China. 7 companies followed the direction of trade flow from China to Sweden. Specifically, Electrolux mainly did arms-length imports from China to Sweden, in order to get intermediate goods; Ericsson and Sony Ericsson shipped the finished goods made in their production bases in China to Sweden10; H&M and IKEA did arms-length trade, to transport finished goods made in China to Sweden; and two Chinese companies, Huawei and Qingdao Pacific Container Co., Ltd11 sold their finished goods to their customers in Sweden.

2) Trade structure. The description of trade structure can be taken from two aspects. One is to discuss the industrial differences on bilateral trade, and the other is to talk about the purpose of goods traded, to go to the final market (finished goods) or be put into further production (intermediate goods). For the MNCs interviewed, steel industry and paper and board industry mainly exported from Sweden to China, while engineering industry, clothing industry,

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10 This is inferred by the author. Ericsson and Sony Ericsson did not tell the author detailed things regarding their trading partners in China. However, from their annual reports and the function of their production bases in China, the author believes that this inference is reasonable.

11 Strictly speaking, Singapore partners hold more share of Qingdao Pacific Container Co., Ltd. than Chinese peers.
furniture industry in China mainly exported their goods to Sweden. And this is consistent with the situation of bilateral trade between China and Sweden. Among these MNCs, finished goods were the main objectives for trade. And among the 10 companies, Electrolux, Sandvik and Tetra Pak mainly dealt with intermediate goods, and the other 7 companies traded with finished goods.

3) Transport mode. For the transport mode choice of these MNCs, transport by sea dominated, then by air. Volvo Construction Equipment and Qingdao Pacific Container Co., Ltd. were the companies, who just used one mode for the international freight transportation between China and Sweden, and other companies used two modes. From the trade direction, all of the goods from Sweden to China were mainly shipped by sea, and these MNCs were Sandvik, Tetra Pak and Volvo Construction Equipment. The goods from China to Sweden were transported eight by sea or air or the combination of the two modes. For the goods mainly moved by air, the high-value attribute was the common point these products shared, in Ericsson, Sony Ericsson and Huawei; while for the goods mainly moved by sea, some of them were high-value products, but their weight and bulk could not be satisfied by air.

4) Transportation quality. Reliability ranked first among all attributes of transportation, and price ranked second. It seemed that no matter what industries are, what kinds of goods are, on-time pickup and delivery is still the basic and important requirement of firms for carriers.

6.2 Practice & Theories

6.2.1 On Trade Theories

Sandvik and Tetra Pak outputted their goods for the production of their Chinese affiliates, which can be explained by the “old” trade theory. These goods traded were hard to be produced in China, since they were high-technology products. And Sweden is a country with advantage in some specific technology, like steel production and food packaging. Goods produced in China, and then were sold to Sweden, which is definitely consistent with the “old” trade theory, since China has the advantages in abundant and cheap labour. However, the three telecommunication companies, Ericsson, Sony Ericsson and Huawei also told us that China could have the ability to produce and
then to export some high-technology goods.

The vertical-specialization-based trade could not find many examples among the MNCs interviewed in this thesis.

**6.2.2 On Types of MNC-base Trade**

Intra-firm trade are rare to see among the MNCs interviewed. And only two MNCs, Sandvik and Tetra Pak did this in-house trade, the inputs provided by their parents; however, the rest MNCs used arms-length trade.

The business linkages developed by the MNC-based trade for the firms in this thesis have shown that the biggest share is taken by MNC-customer, then MNC-supplier, and last MNC parent-foreign affiliates. It can be inferred that market-orientation is the most important issue for MNCs’ export activities.

**6.2.3 On MNCs’ Strategies and Roles of MNCs’ Affiliates**

Two forms of strategies are common to see about the international strategy for corporates, vertical integration and horizontal integration. The author has not tested MNCs’ international strategy in all of its foreign affiliates, but Swedish rooted MNCs in this thesis were inclined to have plants producing the final good in China, such as Electrolux, Ericsson, Sandvik, SCA, Sony Ericsson, and Tetra Pak.

Generally speaking, the roles of MNCs’ affiliates in this study are more like local implementer, with the strategy “locally producing and locally serving”, including Electrolux China, Sandvik China, SCA China and Tetra Pak China. Ericsson China and Sony Ericsson China are more like specialized contributor. However, the author has not found the role of world mandate played by the MNCs in the research.

H&M and IKEA set up their offices in China to help to find suitable suppliers. Huawei’s R&D centre and sales office s in Sweden aim to provide faster and better service for Swedish customers.

**6.2.4 On Freight Demand Characteristics**

Except H&M and IKEA, all of the MNCs interviewed are manufacturing firms, to some degree.
H&M does not own factories of its own; instead it sets up overseas offices that are responsible sales and contacts with the independent suppliers overseas. During the interviews, H&M highlighted the policy impacting on their imports from China. And it can be inferred that that such kind of linkage by contract is inclined to be sensitive to the policy changes. IKEA is a retailer, and they concerned on the overall cost for their purchase in China.

MNCs’ relationship with its foreign affiliates can be understood by the previous part on MNCs’ strategies and roles of MNCs’ affiliates.

MNCs’ (or its foreign affiliates’) commercial positions in this study are quite different. Electrolux is a buyer (for intermediate goods); H&M and IKEA is a buyer (at destination). Ericsson China, Sony Ericsson China, Volvo Construction Equipment, Huawei and Qingdao Pacific Container Co., Ltd are sellers (at the origin); Sandvik and Tetra Pak are sellers of intermediate goods for their affiliates in China.

All of the interviewed MNCs do not have their own fleet, and they purchase the transport service. No matter Swedish side as a buyer or seller, the decision right of the purchase of transport service is always on Swedish side, although some of the corporations leave a little room for their Chinese partners.

Regarding the firm’s characteristics, it is hard to see obvious influence on freight transportation made by these factors.

Goods’ physical attributes (type of products, weight, and value) have a great influence on the freight demand. Goods with high value are inclined to be shipped by air; but for heavy and big goods like construction machine and robot, although they are very expensive, air freight can not justify the weight. For some firms, the goods’ physical attributes even decide the possibility of export or not. SCA China can not import some materials from Sweden, since the attributes of their products need short distance access to some inputs. Scania Sweden can not export to China, and one reason is that their products are too heavy for roads in China.

6.2.5 On Transportation Attributes

The interviewed companies mainly chose reliability and price as their key concerns of the
transportation attributes between China and Sweden. This reflects that on one hand freight transportation should be controlled in an economic way for cutting down cost; and that on the other hand, MNCs need reliable partners to carry their goods.
CHAPTER SEVEN: CONCLUSIONS

After gathering and analyzing both the secondary and the empirical data in this research, the followings results can be concluded:

1. Although the trade flows between China and Sweden have been keeping increasing in recent years and China has shown stronger ability to export to Sweden, some challenges have emerged from the perspectives of MNC. The first challenge has come from the competition from some other developing countries, which may replace the function of China as production base within some Swedish rooted firms, like Ericsson and Sony Ericsson, since the cost in China has kept increasing. The second competition has come from the East European suppliers, since they have had the cost advantage due to the shorter distance transportation. The third one has been due to the updating production ability of Chinese factories, and therefore the exports from Sweden can be replaced by local supply. However, opportunities have co-existed. The intra-firm trade, like Sandvik and Tetra Pak, may increase, because of the quick development of their Chinese affiliates. And the Swedish products with high quality, like Volvo Construction Equipment, may have good sales in Chinese market in the future, due to the strong demand in China. Additionally, policy changes may be positive or negative to the trade increase, and as a result, the trade trend has been hard to predict, just like the situation H&M has faced.

2. Trade theories have partly worked in this research, but the great heterogeneity of firms together and the changing policies have made the estimation of freight demand to be very difficult. Anyway, to understand the final markets needs and the roles of different foreign affiliates of MNCs could be the key.

3. On the trade type, finished goods have dominated the trade market. Intra-firm trade has not been common among these MNCs, but arm-lengths trade has often been used. The reasons may lie in two aspects. On one side, Swedish rooted MNCs` affiliates in China have usually been defined the role as “local production and local sales”; on the other side, market orientation has seemed to be the main driven force.

4. On transport mode, shipping by sea has been the most frequent choice made by the
interviewed firms, then by air. Commodities with high value have usually chosen air transportation; while others have mainly been moved by sea. Besides the value of commodities traded, the physical attributes of commodities, like size, weight and etc., should also been taken into consideration when deciding transport mode. Characteristics of firms have not made a great influence on the mode choice, but the requirements from final customer and the physical attributes of goods have really did.

5. And generally speaking, reliability, price and lead time have to be the key transportation attributes which MNCs interviewed in this research have most concerned on. It can be inferred that on-time pickup and delivery will still be basic and important requirement of firms for carriers, and that a solid and long time relationship between shippers and carriers will still be expected to establish.

By comparison with the research questions and objectives set up in Chapter 1, the status quo of MNCs’ transportation activities in China-Sweden trade including volume in trade, origin and destination, types of goods shipped, choice on modes, and transportation quality required have been clearly given by this thesis. See Conclusion 1, Conclusion 3, Conclusion 4 and Conclusion 5.

For the theories explaining the situation, the author has used trade theories and relative studies on freight transportation for this paper. For trade theories, they just partly worked in this research, and the vertical-specialization-based trade is not the common reason attracting trade volume, but the final markets’ needs and the roles of different foreign affiliates of MNCs are meaningful to explain the trade occurring. For freight transportation theories, some factors mentioned in previous literature really worked, like the requirements from final customer and the physical attributes of goods characteristics; however, the factor on firms has not made a great influence on the transport demand.

The new insights offered by this thesis may lie in two sides. One is that to understand the final markets’ needs and the roles of different foreign affiliates of MNCs could be the key for knowing China-Sweden freight transportation based on MNC-related trade. And the other is that the heterogeneity of firms still needs future study, in order to produce more fruitful results.
CHAPTER EIGHT: LIMITATIONS AND RESEARCH FOR THE FUTURE

It would have been ideal to select such companies ranked like top 10 exporters or importers among Chinese and Swedish enterprises for interview, and then a clearer picture of China-Sweden would have been seen at the level of corporation. Additionally, if more companies have been involved in, and more primary data would have been obtained, then more generalised findings would have been made. However, the time and resources available can not allow for the further study.

It would have been ideal to conduct a face-to-face interview with the target companies, since telephone interview is not good enough to handle the cross-cultural talk although the interview has been prepared seriously and carefully.

It would have been ideal to choose the interviewee, who has the counterpart position of each company, in order to avoid the misunderstanding caused by their positions in the organization. However, it needs more cooperation from enterprises; and it is too difficult for a student to solve it.

It would have been ideal to investigate the secondary data, since much of them were from the websites of companies, and there is a risk that the company speaks more positive things while avoiding the negative.

The author feels that the work for the future can be carried out in the following aspects:

- More detailed data could be obtained to make a detailed classification of MNCs, in order to re-examine the relationship between firms` characteristics and freight demand.
- Stated Preferences Design could be employed to get the accurate answers from interviewees, with the application of computer science.
- Talk with strategic managers, to understand the corporate strategy.
REFERENCES


http://www.wto.org/english/res_e/statis_e/its2008_e/its08_toc_e.htm


*Journal of the European Economic Association*, 4, 602–611
APPENDICES

Appendix A: Sweden’s 20 Largest Corporations by Foreign Sales 2006

1. Volvo, AB
2. Ericsson
3. IKEA
4. Vattenfall
5. Electrolux
6. Skanska
7. SCA
8. Sony Ericsson
9. Volvo Personvagnar
10. Sandvik AB
11. Scania AB
12. H&M Hennes & Mauritz
13. Coop Norden
14. Securitas
15. TeliaSonera AB
16. SKF, AB
17. Atlas Copco
18. Astra Zeneca
19. Preem Petroleum AB
20. ABB Norden

Source: Ekonomisk Litteratur and Swedish Trade Council
## Appendix B: Trade Structure of Swedish Exports to China in 2007

### Swedish Exports to China by HS Code in 2007 (Million US $)

<table>
<thead>
<tr>
<th>HS Code</th>
<th>Commodity Category</th>
<th>Year 2007</th>
<th>Share %</th>
<th>Change % (2007/2006)</th>
</tr>
</thead>
<tbody>
<tr>
<td>84</td>
<td>Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof</td>
<td>955</td>
<td>30.2</td>
<td>26.5</td>
</tr>
<tr>
<td>85</td>
<td>Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles</td>
<td>667</td>
<td>21.1</td>
<td>-4.7</td>
</tr>
<tr>
<td>72</td>
<td>Iron and steel</td>
<td>303</td>
<td>9.6</td>
<td>44.8</td>
</tr>
<tr>
<td>87</td>
<td>Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof</td>
<td>244</td>
<td>7.7</td>
<td>73.8</td>
</tr>
<tr>
<td>48</td>
<td>Paper and paperboard; articles of paper pulp, of paper or of paperboard</td>
<td>186</td>
<td>5.9</td>
<td>6.5</td>
</tr>
<tr>
<td>90</td>
<td>Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments &amp; apparatus; parts</td>
<td>129</td>
<td>4.1</td>
<td>30.5</td>
</tr>
<tr>
<td>29</td>
<td>Organic chemicals</td>
<td>107</td>
<td>3.4</td>
<td>37.3</td>
</tr>
<tr>
<td>39</td>
<td>Plastics and articles thereof</td>
<td>84</td>
<td>2.7</td>
<td>37.4</td>
</tr>
<tr>
<td>47</td>
<td>Pulp of wood or of other fibrous cellulosic material; recovered paper or paperboard; paper &amp; paperboard &amp; articles thereof</td>
<td>82</td>
<td>2.6</td>
<td>-13.3</td>
</tr>
<tr>
<td>30</td>
<td>Pharmaceutical products</td>
<td>65</td>
<td>2.1</td>
<td>39.8</td>
</tr>
<tr>
<td>73</td>
<td>Articles of iron or steel</td>
<td>63</td>
<td>2</td>
<td>39.2</td>
</tr>
<tr>
<td>74</td>
<td>Copper and articles thereof</td>
<td>57</td>
<td>1.8</td>
<td>16.4</td>
</tr>
<tr>
<td>76</td>
<td>Aluminium and articles thereof</td>
<td>27</td>
<td>0.9</td>
<td>77.2</td>
</tr>
<tr>
<td>94</td>
<td>Furniture; bedding &amp; similar stuffed furnishings; lamps &amp; lighting fittings; illuminated signs, illuminated name-plates &amp; the like; prefabricated buildings</td>
<td>20</td>
<td>0.6</td>
<td>157.7</td>
</tr>
<tr>
<td>40</td>
<td>Rubber and articles thereof</td>
<td>17</td>
<td>0.6</td>
<td>50.7</td>
</tr>
<tr>
<td>59</td>
<td>Impregnated, coated, covered or laminated textile fabrics; textile articles for industrial use</td>
<td>16</td>
<td>0.5</td>
<td>13.9</td>
</tr>
<tr>
<td>8</td>
<td>Edible fruit and nuts; peel of citrus fruit or melons</td>
<td>14</td>
<td>0.5</td>
<td>0.4</td>
</tr>
<tr>
<td>44</td>
<td>Wood and articles of wood; wood charcoal</td>
<td>13</td>
<td>0.4</td>
<td>-20.9</td>
</tr>
<tr>
<td>38</td>
<td>Miscellaneous chemical products</td>
<td>12</td>
<td>0.4</td>
<td>-2.1</td>
</tr>
<tr>
<td>32</td>
<td>Tanning or dying extracts; tannins &amp; their derivatives; dyes, pigments &amp; other colouring matter; paints &amp; varnishes; putty &amp; other mastics; inks</td>
<td>12</td>
<td>0.4</td>
<td>30.8</td>
</tr>
<tr>
<td>86</td>
<td>Railway or tramway locomotives, rolling-stock &amp; parts thereof; track fixtures fittings &amp; parts thereof; mechanical traffic signalling equipment</td>
<td>12</td>
<td>0.4</td>
<td>-80.6</td>
</tr>
<tr>
<td>34</td>
<td>Washing preparations, lubricating preparations, artificial waxes, modelling pastes, etc.</td>
<td>9</td>
<td>0.3</td>
<td>212.7</td>
</tr>
<tr>
<td>75</td>
<td>Nickel and articles thereof</td>
<td>7</td>
<td>0.2</td>
<td>100.2</td>
</tr>
<tr>
<td>83</td>
<td>Miscellaneous articles of base metal</td>
<td>6</td>
<td>0.2</td>
<td>72.1</td>
</tr>
<tr>
<td>68</td>
<td>Articles of stone, plaster, cement, asbestos, mica or similar materials</td>
<td>5</td>
<td>0.2</td>
<td>264.3</td>
</tr>
<tr>
<td>82</td>
<td>Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal</td>
<td>5</td>
<td>0.2</td>
<td>-4.8</td>
</tr>
<tr>
<td>41</td>
<td>Raw hides and skins ( other than furskins )</td>
<td>3</td>
<td>0.1</td>
<td>85.9</td>
</tr>
<tr>
<td>81</td>
<td>Other base metals; cermets; articles thereof</td>
<td>3</td>
<td>0.1</td>
<td>231.2</td>
</tr>
<tr>
<td>49</td>
<td>Printed books, newspapers, pictures and other products of the printing industry; manuscripts, typescripts and plans</td>
<td>3</td>
<td>0.1</td>
<td>13.2</td>
</tr>
<tr>
<td>28</td>
<td>Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals of radioactive elements or of isotopes</td>
<td>3</td>
<td>0.1</td>
<td>104.1</td>
</tr>
</tbody>
</table>

**Sum of the Commodity Listed**: 3,132  
99.1  
18.7

*Source: Ministry of Commerce of the People’s Republic of China*
## Appendix C: Trade Structure of Swedish Imports from China in 2007

### Swedish Imports from China by HS Code in 2007 (Million US $)

<table>
<thead>
<tr>
<th>HS Code</th>
<th>Commodity Category</th>
<th>Year 2007</th>
<th>Share %</th>
<th>Change % (2007/2006)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter</td>
<td>Value of Total Commodity Imported from China to Sweden</td>
<td>3,160</td>
<td>100</td>
<td>17.6</td>
</tr>
<tr>
<td>85</td>
<td>Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles</td>
<td>1,867</td>
<td>28.9</td>
<td>44.7</td>
</tr>
<tr>
<td>94</td>
<td>Furniture; bedding &amp; similar stuffed furnishings; lamps &amp; lighting fittings; illuminated signs, illuminated name-plates &amp; the like; prefabricated buildings</td>
<td>638</td>
<td>9.9</td>
<td>40</td>
</tr>
<tr>
<td>84</td>
<td>Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof</td>
<td>627</td>
<td>9.7</td>
<td>33.6</td>
</tr>
<tr>
<td>62</td>
<td>Articles of apparel and clothing accessories, not knitted or crocheted</td>
<td>470</td>
<td>7.3</td>
<td>25.3</td>
</tr>
<tr>
<td>61</td>
<td>Articles of apparel and clothing accessories, knitted or crocheted</td>
<td>366</td>
<td>5.7</td>
<td>27.7</td>
</tr>
<tr>
<td>73</td>
<td>Articles of iron or steel</td>
<td>238</td>
<td>3.7</td>
<td>45.8</td>
</tr>
<tr>
<td>95</td>
<td>Toys, games and sports requisites; parts and accessories thereof</td>
<td>221</td>
<td>3.4</td>
<td>11.6</td>
</tr>
<tr>
<td>64</td>
<td>Footwear, gaiters and the like; parts of such articles</td>
<td>168</td>
<td>2.6</td>
<td>6.8</td>
</tr>
<tr>
<td>42</td>
<td>Articles of leather; saddlery &amp; harness; travel goods, handbag &amp; similar containers; articles of animal gut</td>
<td>159</td>
<td>2.5</td>
<td>8</td>
</tr>
<tr>
<td>39</td>
<td>Plastics and articles thereof</td>
<td>152</td>
<td>2.4</td>
<td>32.6</td>
</tr>
<tr>
<td>87</td>
<td>Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof</td>
<td>128</td>
<td>2</td>
<td>19.7</td>
</tr>
<tr>
<td>90</td>
<td>Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments &amp; apparatus; parts</td>
<td>119</td>
<td>1.8</td>
<td>10.9</td>
</tr>
<tr>
<td>83</td>
<td>Miscellaneous articles of base metal</td>
<td>98</td>
<td>1.5</td>
<td>51.8</td>
</tr>
<tr>
<td>63</td>
<td>Other made up textile articles; sets; worn clothing and worn textile articles; rags</td>
<td>89</td>
<td>1.4</td>
<td>19</td>
</tr>
<tr>
<td>44</td>
<td>Wood and articles of wood; wood charcoal</td>
<td>81</td>
<td>1.3</td>
<td>36.3</td>
</tr>
<tr>
<td>82</td>
<td>Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal</td>
<td>70</td>
<td>1.1</td>
<td>20.3</td>
</tr>
<tr>
<td>89</td>
<td>Ships, boats and floating structures</td>
<td>69</td>
<td>1.1</td>
<td>-58</td>
</tr>
<tr>
<td>70</td>
<td>Glass and glassware</td>
<td>64</td>
<td>1</td>
<td>51</td>
</tr>
<tr>
<td>40</td>
<td>Rubber and articles thereof</td>
<td>62</td>
<td>1</td>
<td>68.1</td>
</tr>
<tr>
<td>72</td>
<td>Iron and steel</td>
<td>61</td>
<td>1</td>
<td>327.8</td>
</tr>
<tr>
<td>69</td>
<td>Ceramic products</td>
<td>57</td>
<td>0.9</td>
<td>48.3</td>
</tr>
<tr>
<td>96</td>
<td>Miscellaneous manufactured articles</td>
<td>56</td>
<td>0.9</td>
<td>32.7</td>
</tr>
<tr>
<td>3</td>
<td>Fish and crustaceans, molluscs and other aquatic invertebrates</td>
<td>47</td>
<td>0.7</td>
<td>65.2</td>
</tr>
<tr>
<td>48</td>
<td>Paper and paperboard; articles of paper pulp, of paper or of paperboard</td>
<td>35</td>
<td>0.6</td>
<td>47.4</td>
</tr>
<tr>
<td>65</td>
<td>Headgear and parts thereof</td>
<td>34</td>
<td>0.5</td>
<td>18</td>
</tr>
<tr>
<td>28</td>
<td>Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals of radioactive elements or of isotopes</td>
<td>33</td>
<td>0.5</td>
<td>-12</td>
</tr>
<tr>
<td>34</td>
<td>Washing preparations, lubricating preparations, artificial waxes, modelling pastes, etc.</td>
<td>33</td>
<td>0.5</td>
<td>56.4</td>
</tr>
<tr>
<td>81</td>
<td>Other base metals; cermet; articles thereof</td>
<td>30</td>
<td>0.5</td>
<td>60</td>
</tr>
<tr>
<td>29</td>
<td>Organic chemicals</td>
<td>29</td>
<td>0.5</td>
<td>60.3</td>
</tr>
<tr>
<td>71</td>
<td>Pearls, precious or semi-precious stones, etc. &amp; articles thereof; imitation jewellery; coin</td>
<td>28</td>
<td>0.4</td>
<td>23.2</td>
</tr>
<tr>
<td><strong>Sum of the Commodity Listed</strong></td>
<td><strong>6,127</strong></td>
<td><strong>95</strong></td>
<td><strong>31.4</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Source: Ministry of Commerce of the People’s Republic of China*
Appendix D: Transportation between China and Europe

<table>
<thead>
<tr>
<th>Traffic modes</th>
<th>EU-15</th>
<th>U.S. West Coast</th>
<th>U.S. East Coast</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time (days)</td>
<td>Freq.</td>
<td>Time (days)</td>
<td>Freq.</td>
</tr>
<tr>
<td>China</td>
<td>1</td>
<td>1/d</td>
<td>1</td>
<td>1/d</td>
</tr>
<tr>
<td>Air, parcel/belly</td>
<td>4-6</td>
<td>1-5/w</td>
<td>4-6</td>
<td>1-5/w</td>
</tr>
<tr>
<td>Air, economy</td>
<td>17-30</td>
<td>1/w</td>
<td>11-13</td>
<td>1/w</td>
</tr>
<tr>
<td>Sea, container*</td>
<td>16-18</td>
<td>1/w</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Sea + air</td>
<td>19-21</td>
<td>1/w</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Sea + rail</td>
<td>13-21</td>
<td>1/w</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Road</td>
<td>18-21</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>India</td>
<td>13-21</td>
<td>1/w</td>
<td>11-13</td>
<td>1/w</td>
</tr>
</tbody>
</table>

* The shorter time regards the voyage directly between continents, and the longer includes port calls along the actual route or feeder services.

Sources: Websites of American Airlines, DHL, Federal Express, Lufthansa, Maersk Line and Schenker; interviews 2005 with Andersson (DHL), Engelhardt (Schenker), and Sjögren (Volvo Logistics).
d, day; w, week; n.a., not applicable; LSU, logistics service users; LSP, logistics service providers.

Source: Woxenius, 2006