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Carrier selection from a 3PL perspective

A case study of Kuehne + Nagel alliances with carriers in Sweden

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Abstract

Third-party logistics (3PLs) play an important role in overall economy since companies can focus on their core business and contract 3PLs to be in charge of its logistics operation. Many 3PLs do not own all assets in the transportation chain and commonly rely on carriers to ship their client's loads. Therefore, the alliances between 3PLs and carriers are an important element to be considered in this business reality. Past studies investigated relevant aspects when companies choose carriers. However, the academic debate lacks content from a 3PL point of view. Therefore, the purpose of this study is to indicate the best approach to choose alliances with carriers from a 3PL perspective. The research is based on a case study of the 3PL Kuehne + Nagel in Sweden and its client, referred as The Large Swedish Exporter.

Seven important aspects outlined by past studies were tested in a 3PL reality. Those aspects are "Cost", "Reliability in picking and delivery times", "Transit Times", "Ability to deal with unexpected", "IT data capabilities", "Customer Relations" and "Damage Risk". It was found out that 3PLs seem to consider the aspects as a package. Hence, a carrier needs to simultaneously fulfil several different requirements to be a good fit. The highest importance was given for the aspects "Reliability in picking and delivery times" and "Cost". Only the aspect "transit times" seems not to be relevant in this environment. Besides what was pointed out by other authors, "Ability to deal with seasonality" and "Coopetition relationship" have shown to be relevant aspects for 3PL in the Swedish reality. Practical improvements were suggested for the company Kuehne + Nagel considering their relationship with five different carriers.

Key words: Third-party logistics, carrier selection, carrier choice, coopetition, alliance.

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1.0 Introduction

This chapter shows a background regarding the importance of 3PLs and describes the cooperation relationship of alliances between 3PLs and carriers. Thereby, it is presented the studied company, the client, and the carriers. In addition, the purpose of the research and research question is established.

1.1 Background Description

Third-party logistics (3PLs) has an important role in the supply chain. It supports the overall economy because companies can concentrate on their core business and contract a 3PL to be in charge of its logistics operations (Hong et al, 2004). This type of business offers a wide option of services such as intermodal transportation, warehouse, cross-dock, importation and exportation documents and extra value-adding services. Traditional transporters or warehouse companies differ from this model because they can just offer a specific service inside the logistics system while 3PLs can be in charge of the whole distribution system of a company (Mingxiu et al, 2012).

Alliances with carriers is a key decision of most of 3PLs operations. When choosing a carrier, many companies will focus on cost and transit times. However, there exist many other relevant aspects that cannot be easily quantified. Those aspects will differ from company to company (Meixell and Norbis, 2008). To choose the correct carrier is not just selecting the cheapest and fastest, but select an efficient distribution which may be a tool for achieving a competitive advantage (Reimann, 1989)

Alliance can be understood as “an arrangement or relationship between independent business with corresponding goals, established for a specific purpose” (Business Dictionary, 2018). In the case of alliances between 3PLs and carriers, the purpose is to transport shipments for a specific client.

Many of those alliances are made with companies that offer similar services, acting as competitors and cooperators at the same time. Yong et al (2014) refer to this type of relationship as competitive alliance and Cygler and Debrowska (2015) refer to their actors as “coopetitors”.

There are great advantages and risks related to these types of alliances. 3PLs need to be aware of the characteristics of such relationships to better manage their interactions.

1.2 Purpose of the research

Alliances with carriers are an important part of a 3PL business model. However, the literature lacks a research focusing on how 3PLs choose their alliances with carriers.

Kuehne + Nagel Group is one of the largest 3PLs in the world. The company is established in Sweden for 45 years and has long-term agreements with several clients. The focus company will be referred in this paper as “Large Swedish Exporter”. This client holds the largest volume shipped in the country by K+N, its warehouses are located in central and south Sweden and its products are usually sent to different ports in the UK.

The focus of this research will be given to the client’s shipments and K+N Sweden alliances with different carriers to transport such volumes. It will be analyzed the characteristics of the five carriers that holds the majority of the shipments and how K+N decides to designate different volumes for each of them.

1.2.1 Research Question

As a guideline for the research the following research question is proposed.

“What is an appropriate approach to choosing alliances with carriers from Kuehne + Nagel in Sweden perspective?”

1.3 Delimitation of the study

This study has certain limitations in consequence of the availability of empirical findings and time. It will not be the focus of this work to study the effects of choosing different transportation modals such rail, road or maritime, neither are aspects related to different routes. The studied carriers are the ones which K+N already has established alliances, carriers that are not commonly in contact with the company were not considered. Additionally, the view of the studied client has not been investigated.

2.0 Literature Review and Theoretical Framework

This chapter contains the research already performed in the subjects of the study. It starts with an overview of services offered by 3PLs, differences between 4PL and different types of 3PLs. Therefore, it is presented the criteria considered for carriers' selection and it concludes by describing the characteristics of cooperation between companies.

2.1 Third-Party Logistics (3PLs)

Nowadays, it became difficult to have a successful business without collaboration with external partners. The growth of logistics outsourcing through 3PLs is justifiable by benefits such as reduced costs, improvement in performance, access to technologies and focusing on the core business of the company. (Aguzzoul, 2014).

This sector can offer a diversity of activities for different logistics process. Aguezzoul (2014) consolidated such activities in the Table 1.

Logistics processes	Activities
Transportation	Road rail air sea, intermodality management, shipping, forwarding, package express carrier, customs brokering, (de) consolidation, perishable/hazardous goods management, freight bill payment/audit.
Outbound (Distribution)	Merge in transit, order fulfilment/processing, picking, sorting, dispatching, post-production configuration, installation of products at the customer's site.
Warehousing	Storage, receiving, cross-docking, (de) consolidation, perishable/hazardous goods.
Inventory management	Forecasting, slotting/lay out design, location analysis, storage/retrieval management.
Packaging	Design, labeling, assembly/packaging, palletizing.
Reverse logistics	Pallets flows management, recycling, reuse, remanufacturing disposal management, repair, testing/ products serving, return shipment management.

Table 1: Aguezzoul (2014) Activities associated with contract logistics

In 1996, Accenture invented and registered the term Fourth Party Logistics (4PL), describing it as “A supply chain integrator that assembles and manages the resources, capabilities and technology of its own organization with those of complementary service providers to deliver a comprehensive supply chain solution.” (Accenture, 2018). Many authors used the term and

described the differentiation between 4PL and 3PL. Love (2004), Duton (2009) differentiate traditional 3PLs from 4PLs based on assets, the former may have its own assets and resources such as fleet and warehouse, while 4PLs do not have assets. Besides assets, Duton (2009) defends that a truly 4PL should provide services like procurement and supply chain consulting, services which are not usually offered by 3PLs

Lindsey (2014) defines as “non-assets based 3PLs” those 3PLs that do not own the physical distribution of goods, but are in charge of the logistics network, acting as brokers that match the carriers’ capacity, with the shippers’ demand. The primary assets that characterized these types of 3PLs are their expertise, knowledge of the market and information system.

It is defined as “Assets-based 3PLs” those which own assets as warehouses and transportation fleet as trucks, vessels, trains, and wagons. According Carvalho (2016) the main advantage of this type of 3PL is that the supply chain has fewer points of contact and it becomes easier to offer affordable prices.

The logistics company Kuehne + Nagel has strong alliances with carriers that is considered a primary asset. Moreover, the category 3PL describes better K+N’s business model than 4PL, since the company does not offer procurement and supply chain consulting services. Additionally, K+N owns certain assets in some countries and, at the same time, utilizes assets of partner-carriers for distribution of goods. Therefore, it was created a term “Partially assets-based 3PL” which better describe the company for this thesis purpose.

In the Figure 1 it is exemplified the terms “4PL”, “Non-assets based 3PL”, “Partially-assets based 3PL”, ‘Assets-based 3PL’.

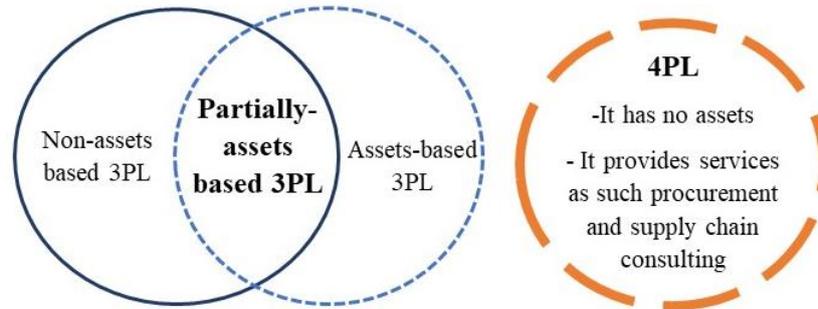


Figure 1: Differentiation between 4PL and types of 3PL

Much research in the area has been developed, mainly with an empirical approach through surveys (Konstatinos, 2007). Different focus was put on outsourcing decision, risks, and benefits (Skjoett-Larsen, 2000; Bolumole, 2001; Wilding and Juriado, 2004), services offering and usage (Murphy and Poist, 2000), and the network level (Larson and Gammelgaard, 2001; Carbone and Stone, 2005). Selection criteria for 3PLs providers is also a recurrent theme of research (Andersson and Norman, 2002; Briggs et al, 2010; Knemeyer and Murphy, 2005). it mostly analyzes the important characteristics for different companies to choose 3PLs.

2.2 Carrier Selection

Researchers have been attracted to this topic over the years. One study performed almost 50 years ago by Baumol and Vinod (1970) investigated how shippers choose their transport by developing a model considering trade-offs between freight rates, speed, dependability, and route losses. Many aspects have been affecting this decision since then, for instance, the change of manufacturing industries for Just in Time (Bagchi et al., 1987), the de-regulation of transportation industries in 1980s in USA, known as the Motor Carrier act (Bardi et al 1989; McGinnis 1990) and advance in technology for data and services (Premeaux, 2007).

Foster and Strasser (1991) conducted their study to find out why shippers and carriers rank selection factors differently. Carriers believed that clients valued price, even when it was said explicitly that they value service. On the other hand, shippers pointed out to value long-term agreements, but did not reward carriers for such agreements. It was concluded that the criteria

for selections should be considered as a package. Additionally, carriers and shippers should reward their partners focused on the true goals of the company.

Gibson et al (1993) demonstrate that the criteria for transportation choice changes when shippers and carriers decide to form a long-term partnership instead of a transaction-based relationship. In this environment the relevant aspects, in importance order, are willingness to meet service expectations, established history of outstanding performance, willingness to focus on continuous improvement, ability to handle special needs and emergencies, willingness to meet cost goals, strong technical capability, and established safety programs. In another study performed some years later, Gibson et al (2002) compared what carriers and shippers value in a partnership. For shippers the attributes valued are cost, effectiveness, and trust. On the other hand, carriers ranked trust, effectiveness, and flexibility as most important.

Premeaux (2002) performed a study that analyzed the development of the concerns on motor carrier selection. It showed that differently from past research, shippers in 2001 were concerned about access to information, consistent carrier performance, solid customer relations, and availability of certain desired services. In similar research developed some years later, Premeaux (2007) discovered that other aspects were also considered relevant for selecting motor carriers, as flexible rates, respond effectively to unexpected situations, and provide information and services through a web electronic-data-interchange. This study shows a shift of technological aspects for carrier choice.

Dobie (2005) introduced a bilateral selection process, where carriers also have a space to develop a selection criteria. It was pointed out aspects that are important for the shippers such as offering timely loads, offering sufficient volume to justify the cost-to-serve, making efficient use of the carrier's freight equipment, and packaging of the goods to minimize loss and damage.

Danielis et al (2005) performed a study with manufacturing companies in Italy showing that shippers prefer quality over price. In other words, they are willing to pay more for reliability and safety of their shipments.

Zsidisin et al (2007) defends that a close relationship between carrier and shipper does not affect on time delivery. However, this proximity is indicated to be beneficial to the willingness of the carrier to commit assets to the shipper during constrain times.

Patterson et al (2010) developed a research in Canada that tested how third-party logistics choose their carrier, different from end-shippers. Five carrier attributes were provided; cost, on time reliability, damage risk, security risk and whether the carrier would send the shipment by rail for a portion of the journey. The author did not consider time required for shipment for believing that this aspect refers to the specific shipment and do not refer to specific carriers. It was concluded that for regular products that are not high value or fragile 3PLs are more cost sensitive than end-shippers. Also, 3PLs are more sensitive for on time reliability. However, damage risk was pointed out as being more important for end-shippers than for 3PLs when considering non-fragile goods. Finally, 3PLs proved to be more resistant to intermodal rail choice than other companies and it is believed that this behavior is in consequence of a bad rail reputation regarding its services characteristics. Williams et al (2013), Lammgård et al (2013), Floden et al (2010) and Meixell and Norbis (2008) oppose the idea of Patterson et al (2010) regarding “transit times”. The authors consider this aspect as important for carrier selection.

In a review of the studies regarding the factors that influence the buyer’s choice of transport services, Floden et al (2010) included studies in European conditions where the customer opinions were considered through surveys and interviews. The authors concluded that studying the attitudes of the decision-makers can be challenging, but it a recommendable approach to reveal the reasons behind the transport service choice. Previous studies showed that after ensuring that a transportation company fulfils basic quality requirements like on-time delivery, transport times and transport damage, the decision is made based on lower price. It was also shown that a low willingness to pay extra for lower environment impact exists.

Lammgård et al (2013) performed a survey among the large manufacturing and wholesale companies in Sweden questioning employees responsible for the purchase of transport services about their purchasing behavior. The respondents showed good knowledge regarding the use of different modals. It was asked for the respondent to allocate weights of 100% between demands for transport according to their importance. Four important aspects were given by the

authors: price, transport time, punctuality, and environment efficiency. The result is illustrated in the figure 2 and shows price as the most important aspect, followed by punctuality.

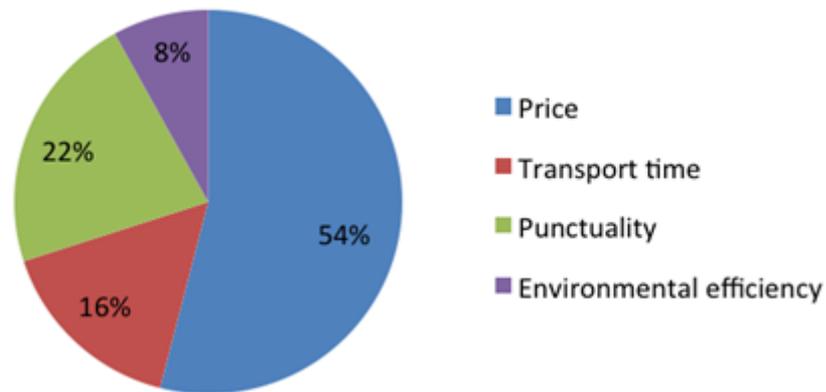


Figure 2: The trade-off between price, transport time, punctuality and environmental efficiency, where the respondents distributed 100% between these four aspects, Lammgård et al (2013)

Less-than-truckload shippers choices for motor carriers were researched by Williams et al (2013). The main aspects for the investigated population was, in order of importance, delivery shipments when promised, pick up shipments when promised, competitive rates and transit times.

In a recent study, Stephens and Ukpere (2015) studied the degree of influence of factors to choose a carrier from a company perspective. The results showed that the most influence is on freight charges, quality of service, trust, price elasticity and customer relations.

In order to achieve a better overview of the main aspects pointed out in nine of the studies described for carrier selection - Gibson et al, 1993; Gibson et al, 2002; Premeaux, 2002; Premeaux, 2007; Patterson et al, 2010; Jonas et al, 2010; Lammgård et al, 2013; Williams et al, 2013; Stephens and Ukpere, 2015, the Table 2 is presented. The important aspects and the number of articles referring to it are ranked in the Table 1. “Cost”, “Reliability of delivery and picking times” and “Transit times” are the overall aspects considered most relevant by the studies.

<i>Aspects</i>	<i>Articles</i>	<i>Rank</i>
Cost	6	1
Reliability of delivery and picking times	4	2
Transit time	3	3
Flexible Rates	2	4
Ability to deal with unexpected	2	4
IT data capabilities	2	4
Customer relations	2	4
Damage risk	2	4
Willingness to meet service expectation	1	5
Continuous improvement	1	5
Outstanding history performance	1	5
Technical Capability	1	5
Effectiveness	1	5
Trust	1	5
Intermodal transport	1	5
Environment efficiency	1	5

Table 2 Relevant aspects for carrier selection ranked

The aspects ranked from 1 to 4 were considered to build a model that will be tested in the case study. The final aspects chosen were “Cost”, “Reliability of delivery and picking times”, “Transit times”, “Ability to deal with unexpected”, “IT data capabilities”, “Customer relations” and “Damage risk”. The aspect “Flexible rates” was not considered due to having a close relationship with the already considered aspect “Cost”.

2.3 Coopetition

Coopetition is defined as a combination of competition and cooperation that is profitable for both companies (Cygler and Debrowska, 2015) and it should be the focus for companies with a strong position in the market, but with lack of resources (Bengtsson and Kock, 1999). In a study performed by Cygler and Debrowska (2015), the significance of coopetitors’ attributes

such size, geographical scope, market and technological positions was analyzed. The results were divided by area between R&D, input supply, products/services, sales/distribution, marketing, logistics, finance, IT, and human resources. The relevant results for this research is regarding the area of logistics, that showed a preference for partner's technological position followed by partner's size.

Research in cooptation is being developed over the past 20 years, but Bengtsson and Kock (2014) in a literature review revealed that still lack of proper definition. A new definition of the term was proposed (Bengtsson and Kock, 2014, p.180); "cooptation is a paradoxical relationship between two or more actors, regardless of whether they are in horizontal or vertical relationship, simultaneously involved in cooperative and competitive interactions".

Yong et al (2014) points out the choices of relationship structures when a company is allying with competitors. Competitive alliance showed similar definition than cooptation and it is recognized when both companies have mixed roles as competitor and cooperator. For this type of relationship, the necessity of a proper governance structure to balance the forces is defended. Competitive alliances will differ depending on characteristics of resources such imitability, levels of transfer, and cross-business permeability, also depending on risks that can be divided into cooperative and performance and finally depending on alliance structures. In a recent study Resende et al (2018) also point out the importance of governance to maintain a business network between competitors and highlight that cooperation leads to innovative competencies.

The necessity of a governance in the cooptative relationship is a recurrent subject. Two types of governance are pointed out by Schreiner et al (2009), structural and operational. Structural refers to the design of the relationship, through contracts and an equity setup. The operational governance refers to a period after relationship establishment and can have formal or social mechanisms. The mutually binding agreements, such as the writing documents with standard operations procedures and expected behavior of each part is considered a formal mechanism. While the self-regulative rules, based on the moral of each company are considered the social mechanism. It relies on human interaction and may substitute or complement formal control (Kale and Singh, 2009).

It is argued that relational mechanisms should be introduced when a cooperative relationship with competitors is established (Faems et al, 2010; Tsai, 2012). Actions such as frequent workshops, events for interaction, and incentives were pointed as important methods by Eriksson (2010).

Schmoltzi and Whu (2012) researched 226 logistic providers that have a horizontal cooperative relationship. The focus was on the post formation management phase to identify the effects that operational governance has on cooperation commitment and cooperation effectiveness. It was concluded that social and formal governance have a substantial performance effect.

The research on co-competition focused on different outcomes, mainly in competitive advantage (Gnyawali & Madhavan, 2001; Lado et al, 1997), knowledge sharing (Hutter et al, 2011; Enberg 2012; Tsai, 2002; Ghobadi & D'Ambra 2012; Luo, 2005), creation of innovation (Huang & Yu, 2011; Li et al, 2011; Zhang et al, 2010), interdependency (Dagnino and Rocco, 2009), managing contradictions and tensions (Oliver, 2004; Dowling et al, 1996; Chin, Chan & Lam, 2008; Lacoste, 2012) and balance of paradoxical relationship (Ingram & Yue, 2008; Nasholm & Bengtsson, 2013; Peng & Bourne, 2009). However, there is a lack of research analyzing the horizontal relationship between different third-party logistics.

In a study performed with Swedish and Finnish companies, Bengtsson and Kock (2000) outlines some characteristics of co-competition between those firms and different types of cooperation with competitors (Fig. 3). One of the findings is that the division between cooperation and competition is settled in relation to the proximity with the customer. The researched Scandinavian companies cooperate in activities far from the customer and compete on activities close to the customer.

Therefore, one of the reasons pointed out for co-competition is the heterogeneity of resources. Different firms hold different resources that sometimes are used as a competitive advantage and in others, best utilized in combination with competitors' resources. In the article it was argued that to establish and maintain a co-competitive relationship, the both behaviors should be split. The benefits of this type of relationship between the companies is the lower cost for developing new products, shorter lead times and each company contributes in its core competence.

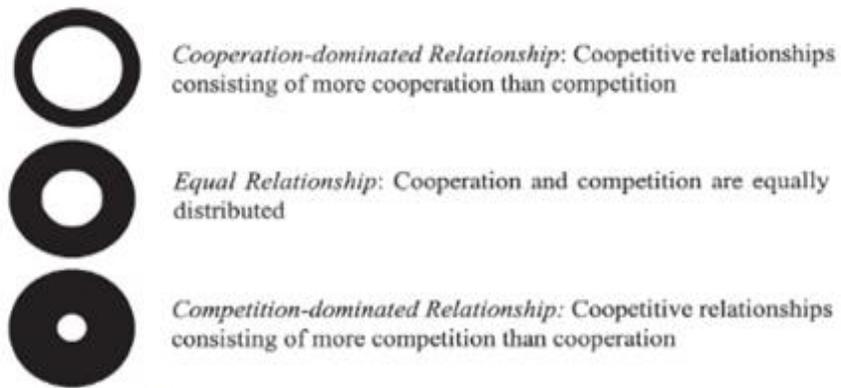


Figure 3: Bengtsson and Kock (2000). Different types of cooperative relationship between competitors

Lindstrom and Polsa (2015) divided the coopetition interaction in output and input activities. The activities that are performed close to the customer, as marketing and sales, are considered output. Therefore, the ones operated far from the customer, as production, logistics, research & development, are considered input. In the study, the level of cooperation between competitors in output activities was analyzed and it was concluded that activeness, geographical distance, and personal resources are success factors for this type of coopetition.

3.0 Methodology and Methods

This chapter starts explaining the research approach with a timeline of the considered steps, followed by a description of the case study performed. Therefore, different methods for data collection are presented. Finally, the validity, reliability and generalizability of this research are discussed.

3.1 Research approach

Some authors defend that it is necessary to distinguish between qualitative and quantitative research, but others consider it no long useful or a false distinguishment (Bryman and Bell, 2011). It is believed that such distinction is useful for this study and depends on different methods. For the majority of the research a qualitative approach was taken. Collis and Russel (2013) affirm that qualitative data is only understood if it is given a context, so it is necessary to first of all collect background information, known as *contextualization*. It is possible to find such contextualization in many chapters of this paper as Introduction (1.0), Literature Review (2.0) and Empirical Findings (4.0). In order to complement this approach for a minor part of the analysis a quantitative approach is taken, namely the point allocation questionnaire, explained in detail in the chapter 3.3.2.

Bryman and Bell (2011, p.28), states that “the use of a mixed methods approach that combined quantitative and qualitative research enable a more rounded and complete pictured to be drawn.”. A timeline of the main steps taken in this study is represented in the Fig. 4.



Figure 4 Timeline of the steps in the research

This project starts with the definition of a problem inside the company K+N and with the development of a research question. Therefore, it is performed in parallel a literature review of the studied topics and the semi-structured interviews and questionnaires. Thereafter, the empirical findings are summarized. Finally, the analysis and practical suggestions are developed. Finally, all findings are compiled in this final report.

3.2 Case Study

This master thesis uses as base a case study carried out inside the company K+N. Anderson (1993) points out that case studies have as objective to describe how things happen, investigating contextual realities. It does not focus on an entire organization, but on a particular issue. It is defended by the author that case studies allow the understanding of the complex realities.

Case studies have been receiving some criticism regarding the lack of scientific rigor. However, it is defended that cases studies help getting a holistic view of a phenomenon (Hartley, 1994). In this research different interviews with employees of K+N and several carriers were performed which enables a greater picture based on different perspectives. Another advantage pointed out by Hartley (1994) is that case studies are useful for capturing an emergent reality

of a company in situations where changes occur in a fast pace. The logistics sector is changing quickly, and this method fits well to answer the proposed research question taking into consideration the present context. Additionally, Flóden et al (2010) defend that studying the attitudes of the decision-makers regarding choice of transport may be challenging, but it is an appropriate approach to reveal the true rational underpinning the decision.

Yin (1993) points out three types of researches for case studies; exploratory, descriptive, and explanatory. The focus of this research will be exploratory, which focus on an existing literature review aiming to understand and explain real situations.

3.3 Data Collection

In this section it is explained how data was collected through interviews, questionnaires, and internal company files.

3.3.1 Interviews

The interviews are used to gather primary data. The semi-structured interview guide was planned carefully containing different aspects to answer to the research question. Noor (2008) affirms that semi-structured interviews offer more flexibility than structured interviews and it is intended to reach different answers while covering the same areas.

The guideline for the interviews was build based on the literature review and it is available in the Appendix 8.1. A pilot test was performed with an employee of K+N and one of the carriers to avoid questions with double-sense or misleading formulations.

Four employees of K+N were interviewed, and their position, characteristics and main responsibilities are described in the Table 3.

Position	Characteristics	Main Responsibilities	Type of Interview
<i>Freight Forwarder 1</i>	Professional with over 10 years of experience in road transportation. Has been working with K+N for many years but shifted companies during this study.	<ul style="list-style-type: none"> ● Handle the communication regarding operational aspects of the shipment with the client. ● Be the operational point of contact with the carriers. ● Prospects new carriers when it occurs a high demand. 	Face-to-face
<i>Freight Forwarder 2</i>	Professional with over 13 years of experience in the transportation sector. Worked in one of the main Ocean freight companies for 11 years and is working 3 years for Kuehne + Nagel.	<ul style="list-style-type: none"> ● Same than Freight Forwarder 1 	Face-to-face
<i>National Sea freight Business Development Manager</i>	Professional with 6 years of experience, including 3 years inside one of the competitors. Works for K+H for over 1 year.	<ul style="list-style-type: none"> ● Assists established clients, including the Large Swedish Exporter ● Prospects new clients 	Face-to-face
<i>Branch Manager</i>	Professional with over 30 years of experience, including 14 years in operations inside one of the competitors. Works as K+N branch manager for 4 years.	<ul style="list-style-type: none"> ● In charge of all clients and operations inside Sweden ● It is the main commercial contact with the Large Swedish Exporter 	Face-to-Face

Table 3 Employees interviewed at Kuehne + Nagel

The first person to be interviewed was the “Branch Manager” whom indicated the “Business development manager” and both “Freight forwarders” as specialists in the subject and specific client’s demands.

Interviews were also performed with employees of different carriers. The company they represent, position, main characteristics and type of interview can be found in the Table 4.

Carrier	Position	Characteristics	Type of Interview
<i>Carrier 1</i>	Team Leader/Inside Sales	Professional with 6 years of experience in forwarding sales, working 5 years for Carrier 1. Oversee all customers in Sweden.	Face-to-Face
<i>Carrier 2</i>	Forwarder	Professional with 4 years of experience as a forwarder, all of them inside Carrier 2. Responsible for exports from Sweden to UK and the connection with line services and import/export departments.	Phone Interview
<i>Carrier 3</i>	Branch Manager	Professional with 17 years of experience and more than 5 years working for Carrier 3. Responsible for the international freight within Sweden.	Phone Interview
<i>Carrier 4</i>	General Manager	Experienced general manager with 28 years in the transportation/ trucking/ railroad industry. Skilled in operations management, freight, sales, ocean transportation, and freight forwarding. Works for Carrier 4 for 18 years.	Phone Interview
<i>Carrier 5</i>	Forwarder	Professional with 31 years of experience as a forwarder, working for Carrier 5 for 17 years. Responsible for exports of FCL through maritime transportation from Sweden to UK and Ireland.	Phone Interview

Table 4 Interviewed employees at different carriers

The “Freight forwarder 2” and the “Business development manager” shared the contact of the interviewees inside different carriers. Each one was chosen based on their experience and knowledge about K+N and its shipments. The interviews were audio recorded and then immediately transcribed by the author. The transcriptions are available upon request.

3.3.2 Point allocation questionnaire

Point allocation, also known as constant sum, is a methodology to distribute a certain amount of points between a set of objects. The number of points distributed indicates the relative

importance given to each object (Bottomley et al, 2000; Brace, 2008). This strategy forces people to think about all options as a whole and not only the isolated statements (Doyle et al, 1997) and it is useful in this research to make people choose which presented statement have higher importance. This type of questionnaire is objective in nature and it carries little risk against bias. The statements proposed can receive full points or no points at all (Timpany, 2016). Lamngård et al (2013) made use of similar technique for assessing logistics purchasing behavior in Sweden, where it was requested to divide 100 points between the aspects “Price”, “Transport Time”, “Punctuality” and “Environment Efficiency”.

As a drawback, it is outlined by Brace (2008) that respondents can find it hard to fill out such questionnaires because it requires efforts to think simultaneously across all items and do mental arithmetic. The difficulty is raised with the number of items in the questionnaire.

Questioning employees from K+N regarding the importance of aspects for carrier selection or questioning employees from carriers which aspects they put more efforts to fulfill, may not measure which ones are their first concern. People may affirm that all aspects are important without weighting the priorities. However, through the point allocation questionnaire it is necessary to prioritize some aspects in comparison to others. This scenario is similar to the companies' reality that have limited resources, as such the 40 points.

Two different questionnaires were build and can be found in the Appendix 8.2 and 8.3. People were asked to allocate points, summing a total of 40 points, between different statements in order to measure different aspects. The seven aspects to be measured, based on the literature review, are “Cost”, “Reliability of delivery and picking times”, “Transit times”, “Ability to deal with unexpected”, “IT data capabilities”, “Customer relations” and “dDmage risk”. Two statements related to each of those aspects are presented. The complexity of filling out the questionnaire increases for the respondents with the number of items and points to be distributed (Brace, 2008). Therefore, the questionnaire was limited to one page with 14 items and 40 points to be distributed.

The points in both statements were summed and each aspect was ranked. The results from carriers and employees of K+N are compared with the distance formula and analyzed in the chapter 5.1.3.

The distance formula is derived from the Pythagorean Theorem and it calculates the distance between two points. (Stapel, 2018). Therefore, the Euclidean distance is taken as distance measurement and it was determined with Microsoft Excel. For each dimension the difference between K+N and the company is squared in order to get only positive values. Then the squared differences are summed to gain one distance measure. The square root of the sum is taken to arrive at the true distance in multidimensional space. Each company is compared with K+N since this is the target. As smaller the result, as similar are the opinion of the carriers with K+N. The complete calculation can be found in the Appendix 8.4.

$$d(x,y) = \sqrt{\sum_i^n (x_i - y_i)^2}$$

3.3.3 Secondary Data

Besides of the literature review already presented in the Chapter 2.0, secondary data was also gathered through organizational documents that are not in the public domain, provided by K+N. Those documents presented in Microsoft Excel spreadsheet format were useful to place the author in the context of the company, triangulate employees' statements and provide precise numbers regarding volumes, price, profits, and seasonality. Bryman and Bell (2011) state that organizational documents are a very important source in case studies using qualitative interviews.

3.4 Reliability, Validity and Generalizability

Case study research has recognized advantages, but its validity, reliability and generalizability are frequently questioned (Riege, 2003). In this chapter, the measures taken in order to increase the validity, reliability and generalizability of this research are described.

3.4.1 Reliability

A reliable research is transparent and absent of errors. It means that if the same research was repeated, the same results would be found (Farquhar, 2013).

The transparency can be reached through careful reference to primary and secondary database (Yin, 2009). It is also recommended to consider the use of tables to present accessible information to the reader (Farquhar, 2013). In this research, all references are stated, and it contains a diversity of tables summarizing the main points described in the text.

All the performed interviews were recorded through a mobile phone to assure that collected data was not misunderstood. Additionally, the interviewer could focus on getting the necessary answers instead of taking notes. The words, the tone, the pauses are also recorded and can be listened more than one time for full understanding. Thereafter, the interviews were transcribed word by word. Audio-recording is supported by Riege and Nair (1994) and Bloor and Wood (2008) as effective strategies to raise reliability.

The data collected through the interviews was transcribed word for word immediately after the session, when the context was recent and clear for the interviewer. The transcribed text was sent to the interviewee for approval and correction of misunderstandings. These described steps aid to secure a solid outcome and are supported by Bloor and Wood (2008).

3.4.2 Validity

The validity of a study is measuring if the investigation performed is what it claimed to investigate (Farquhar, 2013). Different methods were implemented to ensure that valid results were reached.

First of all, different sources of evidence were used to increase the validity. The statements made during interviews were compared with internal documents from the company to protect against research bias (Flick, 1992; Peräkylä, 1997; Jick, 1979). Therefore, Noor (2008) affirms that documentary sources are an important supplement to compensate the limitation of certain methods.

Another way of increasing the validity of a research is to establish a chain of evidence (Remenyi et al, 1998; Yin, 2009). A logic and clear chain of evidence to reach a conclusion was constructed, specifying each collection of data. The reader is presented with every used data in order to answer the research questions.

Thereafter, the research draft of the empirical findings was reviewed by a key informant of K+N to assist with unclear or misunderstanding statements, suggesting improvements for the final document. Yin (1994) states that to have the draft reviewed is a good method to increase validity.

Finally, the findings through interviews were analyzed regarding its coherence and concepts. The evidence of the case study was compared with substantial literature review to increase its consistency. Technique that is supported by Yin (1994).

3.4.3 Generalizability

External validity, also known as “generalizability” relates to the issue whether the results of a specific research can be generalized to other cases. It describes the extent to which the case study’s findings are applicable to not researched cases (Farquhar, 2013). In this thesis, it refers to whether the results about a specific third-party logistics in Sweden can be understood as valid results for a population of companies in this sector.

This is a common claim regarding case studies. Many authors defend that multiple case studies can increase the generalizability of a research (Leonard-Barton, 1990; Johnston et al., 1999). However, this was not a strategy used in this paper due time restrictions for exploring different companies suffering from similar problems.

It is highlighted by Flyvbjerg (2006) that generalization can be reached from a single-case study. He states, p. 225: “Is it incorrect to conclude that one cannot generalize from a single case. It depends on the case one is speaking of and how it is chosen”. Additionally, he argues that generalization tends to be overvalued and the force of example underestimated. The main focus of this research is not to be applicable to a large population but serve as an example of a reality inside one of the largest 3PLs worldwide operating in Scandinavian. It is believed that the founded results can be applicable for other large 3PLs operating at the same geographic space.

4.0 Empirical Findings

This chapter contains the information gathered through semi-structured interviews, point allocation questionnaires with employees of K+N and five carriers as well as information from the companies' websites. At first, it is given a background of the studied company. Thereafter, characteristics of the shipments and findings from the main carriers are presented. Finally, the results of the questionnaires and the view of competition inside K+N are shown.

4.1 Kuehne + Nagel Group

Founded in 1890 in Bremen, Germany, K+N has offices in more than 100 countries with over 74.000 employees and it is one of the world's leading logistics provider. It is the market leader in 3PL maritime transport worldwide and this is considered a competitive advantage in comparison to its main competitors. Regarding air transportation, K+N is the second largest forwarder, placed behind DHL. For road transportation in Europe, the company is the third largest, behind DB Schenker and DHL. Additionally, the company invests in a worldwide network of warehouses and distribution (Kuehne + Nagel, 2018B).

The main turnover market is in the EMEA region which corresponds to Europe, the Middle East and Africa, followed by Americas and Asia-Pacific (Fig. 5).

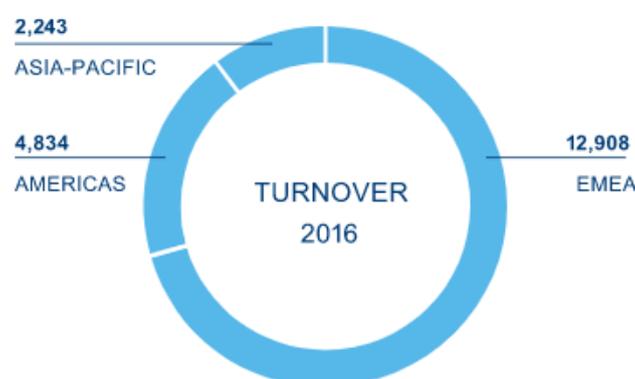


Figure 5 Regional Turnover in Millions of dollars in 2016 (Kuehne + Nagel, 2018B)

Digitalization is one of the focuses of the company. It is the first forwarder to make a platform for quoting, booking, and tracking of sea and air freights through KN Freight Net available.

Investments are being made regarding automation of processes, big data predictive analytics, internet of things and artificial intelligence (Kuehne + Nagel, 2018C). This strategy is explained in an interview with K+N Business Developer (2018): “We’re still a lot of companies (forwarders) but nobody thinks that we are going (to) be able to exist in 5 to 10 years just as an intermediate part between two people booking. So, our method to survive is exactly what is treating us, (it) is technology. That is how we are trying to survive, we are trying to make sure that we out pass the carriers when it comes to everything that has to do with IT, visibility, track and trace, management solutions, all of that, that’s how we are finding our future of existence.”

For the future, K+N is investing in a range of transformative projects focused in three dimensions; customers, technology, and people. Those initiatives will promote a greater customer experience through technology and a long-term plan to retain professional talents (Marle, 2017)

4.2 Kuehne + Nagel Sweden

The company has offices in Sweden for 45 years and nowadays is placed in Gothenburg, Malmö, Stockholm and Norrköping with more than 320 employees. In Gothenburg and Malmö, the company also owns warehouses (Fig. 6).

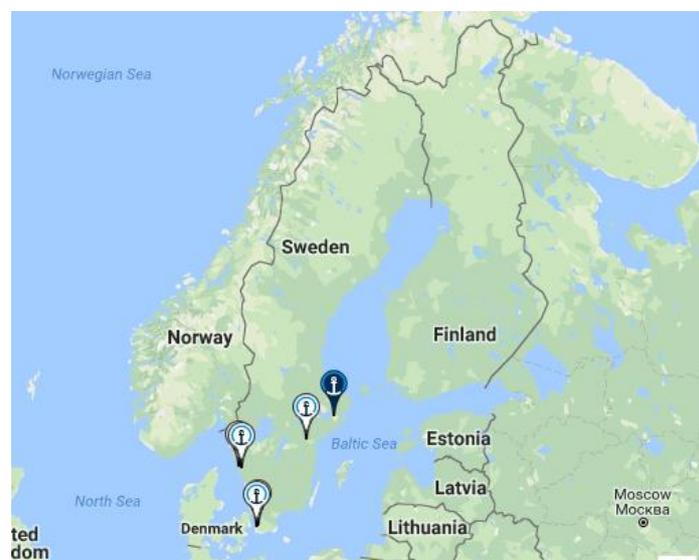


Figure 6 Find Kuehne + Nagel locations in Sweden (Kuehne + Nagel, 2018D)

This research took place inside the office in Gothenburg that is in charge of management of the whole country. Approximately 60 employees work at this location and the spaces are divided between sea and air freight.

The leadership position in 3PL maritime freight is a competitive advantage of K+N Sweden. Many of the clients placed in the country show interest in the reduction of emission from a modal shift from road-rail-airway to sea. The company is looking for new ways of transporting their cargo through maritime containerized transport in Sweden, even considering routes through possible frozen waters in the North (K+N Business Developer, 2018).

4.3 Characteristics of the shipments

The client has a long-term agreement with K+N for moving thousands of TEUs yearly from Sweden to the United Kingdom. In a consequence of those volumes and long-term relationship, the price paid by container has a low profit margin for K+N. The client pays the same price by load, FCL or LTL, independently of the chosen carrier, route, weight, and picking/delivery location. Therefore, cost is an important aspect when selecting a carrier. (K+N Branch Manager, 2018)

The year volume is unstable, with peaks from March till July and November, in response to the summer, Christmas and New Year's Eve, following a high demand for transportation in the region. The seasonality is a challenge that K+N needs to overcome. The high volumes during those months demand a temporary rise in volume from the partner carriers. Some of those carriers may be unavailable, unreliable or charge high rates that cannot be covered with the price paid by the client (K+N Branch Manager, 2018). Thus, one important aspect for K+N to choose a carrier is their capability to deal with their high demand from March to July and November.

Regarding the number of carriers used to transport the volume, different strategies can be approached. K+N Branch Manager (2018) believes that the best strategy would be to work with few carriers and designate high volumes for each of them. He defends that this strategy has a low cost per TEU, a higher reliability and low operational cost because it is not necessary to have employees to deal with shipments separately. However, he affirms that K+N Group shows

concerns regarding the risks of losing the client for one of the carriers if a high percentage of the volume is directed to a single source.

4.4 Main Carriers

At first, during semi-structured interviews employees from K+N were requested to point out the main alliances with carriers for the client Large Swedish Exporter and its important aspects of differentiation. Thereafter, the five main carriers pointed out were interviewed face-to-face and over the phone. The main findings are summarized in this section.

4.4.1 Carrier 1

The main carrier alliance is the Carrier 1, that transports only FCL. They have a rail located in Central Sweden which is entirely dedicated to Large Swedish Exporter's volume that delivers the containers weekly for short sea shipping. The whole transport is usually performed only through rail and short sea in Sweden, without the need for trailers. Despite the carrier transporting a high part of the total volume and holding the lowest rates, this alliance is not perceived as risky by K+N Sweden. K+N Branch Manager (2018) claims that Carrier 1 is not capable of offering the same package of services needed by the client as for instance warehouses in Sweden and UK.

Carrier 1 perceives a good client to be one that is understanding and able to discuss problems in a productive way. "It is important to have a good tone in the daily basis, be able to discuss if there is any obstacle in the way".

When questioned if there is a shortage of capacity during the summer, Carrier 1 affirms that capacity is usually not a problem. He explains that the company can duplicate the number of wagons available without the need of checking for capacity, just advising two weeks in advance. If even more capacity is necessary, he believes to be able to cope, but needs to check ahead. The only capacity constraint might occur if the loads need to be picked up in a location different from the usual warehouse in Central Sweden, because they have few road haulages in the region which might already be dedicated to K+N.

About the summer of 2017 in Sweden, he affirms that was "out of ordinaire" for all carriers and initially occurred as a result of the conflict at the Port of Gothenburg. Carrier 1 believes

that the Port of Helsingborg accepted to receive a higher volume than they were used to handle, and it became an issue for companies that missed a berthing window to book a new one. For summer of 2018, he believes that Carrier 1 has a higher priority inside the port and similar problems will not exist.

The weight of the loads is an important aspect to be considered by Carrier 1. He explained that the limitation follows the legislation in UK. Indeed, Government UK (2018) affirms on its website: “In the UK, with some exceptions, the maximum vehicle weight is 44 tons gross (truck, fuel and load) and has up to 6 sets of axles. Most foreign vehicles coming to the UK have 2 axles on the tractor and 3 on the trailer, which limits them to a weight of 40 tons both here and in their home state.” Nowadays, the limitation established by Carrier 1 for K+N shipments is 25 tons. Carrier 1 told that there is a way of changing such limitation. It is possible to cross dock the loads and thereafter carry them by different trailers in the UK. He states that this service may be negotiated for K+N with no extra cost.

Regarding the services offered to other clients, Carrier 1 affirms that door-to-door is the main solution offered by the company. It was highlighted that they can transport 45 pallets through short sea, which is not usually offered by other companies. Carrier 1 also told that they can offer warehouses in Sweden and UK through an intermediary, the company do not own warehouses on these locations.

The commercial contact is made between both headquarters in the UK, but the operation daily basis communication is handled by both offices in Gothenburg, Sweden by phone and email. Even based at the same city, employees from both companies never met face-to-face.

Carrier 1 affirms that K+N is a major customer for the company because the volume of the Large Swedish Exporter contributes to a considerable part of the total volume in Sweden. In consequence of offering similar solutions, K+N along with other 3PLs is seen by Carrier 1 as a mix between client and competitor.

4.4.2 Carrier 2

Carrier 2 is used by K+N to transport FCL through road haulage and ferry boats from Central Sweden to the UK. The frequency of the service is weekly, and the company holds the second largest percentage of the total volume.

It was affirmed that there is no capacity constraint with the company during the summer because the part of the route made by road is not too long and they have almost the same number of trailers then containers. However, there is a weight limitation of 26,5 tons for the loads.

This alliance is considered risky by K+N Branch Manager (2018) because this carrier can offer similar services to the client like LTL and an owned warehouse in the UK. Carrier 2 recognize the competition relationship in this alliance and affirms to deal with it through a long-term close relationship, based on honesty and transparency. “If the Large Swedish Exporter comes to us and says that (they) will not do anything more with K+N and would like to do with us, I wouldn’t say no, I would of course talk to K+N about it.” The communication is made by emails and, occasionally over the phone. People that are point of contact in both companies never met face-to-face. It was booked a meeting between both parts, but it needed to be canceled.

The importance of having a close and open relationship with the clients was highlighted because it makes it easy to solve unexpected situations. It is required “(...) that we have an open relationship, that we can speak to each other, no hiding from both sides”. For Carrier 2, a good client is the one that is able to pass as much information as possible previously, as picking place and date, number, and weight of containers.

There are two issues mentioned about the Large Swedish Exporter’s shipments. First, sometimes the loads are not available for picking up at the stipulated time, so the company misses the time slot. Second, the complete information regarding the loads does not always come before pick-up times, such as the total weight tonnage which can cause some operational difficulties for Carrier 2. This lack of information reflects the client’s delay to inform K+N.

4.4.3 Carrier 3

An agreement between the Carrier 3 and K+N with a low volume of containers and good rate was made. The FCLs are shipped from South Sweden, through road till a port, where it is sent by short sea to UK. The objective of this agreement is to experience a new alliance with this carrier. Carrier 3 holds just a small volume and it is not perceived as a competitor by K+N Branch Manager (2018) in the moment.

Carrier 3 affirms to be looking for all type of clients and highlights the importance of having companies with good credit. About the offered services, he affirms “We can offer door-to-door in LTL or full trucks, express parcels both domestic and international.” They also own a warehouse in Sweden but not in the UK. “Most of services nowadays are booked at spot, but they are looking for long-term clients.”

During the summer, there is no shortage in capacity, guarantees Carrier 3. It is explained that they are part of a trailer pool with high capacity of loose trailers that are sufficient, even in the summer.

The contact with K+N personnel is made by email and phone, but people from both companies never have met in person. Carrier 3 affirms that the level of competition depends on the country. In Sweden, K+N is seen simply as a client.

4.4.4 Carrier 4

K+N usually contact Carrier 4 when the shipments are too heavy. This carrier transports through road from central Sweden to a Port in southwestern Sweden.

Carrier 4 can provide road transportation, ro-ro shipping, bulk shipping, and door-to-door solutions for its customers. They are searching for long-term clients that can provide a continuous demand. It is desired to know the rough demand beforehand, so it is possible to forecast the volume for specific areas and establish the necessary partnerships.

Some characteristics for being a good client were pointed out. First of all, it is considered important to have financial stability because there are reasonable costs for operating in certain areas of the world, as in Sweden. It is also desired to work with responsible clients that are

willing to have the best practices like following the standards and having the proper insurance. Information was also mentioned as being essential. The driver needs to know everything about the cargo as for instance correct picking and delivery times, place, and security requirements for the load. He stated, “Our job is very simple, (it) is moving things from (point) A to B and, if we do in the right manner, the job can be quite simple, but lack of information is one of the things that makes (it) difficult”. Additionally, a good partnership was also highlighted. It was affirmed that it is desired to have a “good feeling” about the client and “good lines of communication”.

Carrier 4 affirms to suffer from shortage of capacity during high demand periods, for instance during the summer and Christmas. The trailers are destined to long-term clients, proportionally to the volume that such clients book during other times of the year.

The cooperation relationship is recognized by Carrier 4. It is affirmed that K+N is an important client and they have been working together for several years, mainly in Germany and the UK. It is also identified that they are part of the same business and have certain level of competition “(...) within the industry that we work in it is going to have common business, shall we say, when we are both after the same account and that needs to be understood, there is no monopoly”. However, it certain rules for approaching clients were shown. “We are a neutral operator, we will not approach an existing client of K+N when we take an order. We won't be going to this specific client directly”. Carrier 4 concludes “So K+N is both a client and a competitor and we see them as a long term commercial partner”. In Sweden, Carrier 4 says that they have no point of contact, but they know a few people that work for K+N in UK.

4.4.5 Carrier 5

Carrier 5 is also usually chosen when the shipments are too heavy. This carrier transports through road from central Sweden to a Port in southwestern Sweden. Carrier 5 offers different solutions such as sea freight, air freight, door-to-door and warehouses in Stockholm and Gothenburg. Inside the UK, they have an agent that can provide warehouses in the North and South. Rail freight is not possible because the trailers do not have a hook pack to load the containers inside wagons.

The ideal client for the company is loyal, flexible, and understanding because “Sometimes things change in the last minute and there is nothing we can do about it.”. During the summer, they also suffer from a shortage of vehicles. The trailers are usually distributed evenly between the clients. However, it was highlighted that the price is an important aspect too. “There is also something about profit in the loads, I mean, if we have a client that pays more than other client, we take this in consideration”

Long term customers are an interest of Carrier 5 and they keep such relationship through communication and “make them feel that they can rely on us, that we would do the best for their goods and their traffic”. Personal interaction is seen as important, but with K+N most of the communication is made by email, almost never over the phone. Carrier 5 talks to many different people inside K+N, so she does not have any close interaction with someone individually.

K+N is perceived as a competitor by Carrier 5 because both companies are carrying the same goods at the same market. Regarding the specific demand from the Large Swedish Exporter, K+N is a client.

4.4.6 Summary of main characteristics

The carriers are summarized in the Table 5 according the type of load, modal, price, frequency, weight limitation and seasonality.

Carriers	Type	Modals	Price	Frequency	Route	Weight Limitation	Seasonality	Competition
1	FC L	Rail + Container Ship	Lowest	Weekly	Hallberg - Helsingborg - Tilbury	25 tons	No	Not perceived as competitor
2	FC L	Road + Container Ship	Low	Weekly	Kopparberg/Örebro/Asp holmen - Vasteras - Hull	26,5 tons	No	Perceived as competitor
3	FC L	Road + Container Ship	Low	Weekly	Lahom - Helsingborg - Tilbury	25 tons	No	Not perceived as competitor
4	FC L or	Road + Ro Ro vessel	High	Daily	Kopparberg/Örebro/Asp holmen - Gothenburg - Immingham	27 tons	Yes	Perceived as

	Carrier 1		Carrier 2		Carrier 3		Carrier 4		Carrier 5	
	<i>Points</i>	<i>%</i>								
Damage Risk	4	10%	10	25%	7	18%	5	13%	10	25%
Cost	4	10%	2	5%	3	8%	3	8%	2	5%
Ability to deal with unexpected	8	20%	8	20%	5	13%	7	18%	6	15%
Customer Service	8	20%	9	23%	9	23%	8	20%	8	20%
Reliability in Picking and delivery times	7	18%	7	18%	7	18%	10	25%	9	23%
Transit time	5	13%	2	5%	3	8%	3	8%	2	5%
IT data capabilities	4	10%	2	5%	6	15%	4	10%	3	8%

Table 7: Carriers' questionnaire results

4.6 K+N view of coopetition

According K+N Business Developer (2018), the coopetition for 3PLs has its origin when the forwarders start to request “named accounts”. He explains that ten to fifteen years ago 3PLs did not need to identify the company that owns the shipment, it was just requested information about the product itself. For example, the carrier would just see K+N Sweden sending steel to K+N China. Nowadays, they ask the name of the client, the volume, the product, and many other sensitive information to share with a direct competitor.

He affirms that different companies have different strategies, for example, in the shipping industry while one large container carrier is looking for small customers that ship from 200 to 300 containers a year, other large container carrier competitor directs its efforts to larger companies and 3PLs.

The companies in alliances with K+N have, as he calls it, “Gentleman’s agreement”. It is a well understood agreement in the sector, not officially written down, that follows some principles. At first, customers that a 3PL is intermediating for another 3PL must not be “attacked”. However, if there is a shift of intermediators, the “Gentleman’s agreement” is not valid anymore and the 3PL is free to reach that client. He concludes: “Do I like when they attack my clients? No! But I have no objective measure of pressure, I am not in the right anymore because I left them behind. I went to someone else to do the business, so they want the customer directly.”

When questioned if formal binding agreement with any of the carriers exist, he affirms that the only written document is a contract that established the rate to be applied for a specific route and type of load. No additional information as working standards, volume or behavior regarding the client is stated in the contract.

5.0 Analysis

This analysis chapter is based on the literature review in comparison to the empirical findings and points allocation questionnaires. It is divided in three different sections; influential aspects in carrier choice for 3PLs, competition and gap analysis between K+N and carriers.

5.1 Influential aspects in carrier choice for 3PLs

Patterson et al (2010) opposes other authors (Williams et al, 2013; Lamngård et al, 2013; Meixell and Norbis, 2008) and defends that “transit times” is not an aspect to be considered when choosing a carrier since this is a specific characteristic of a route, independently of the selected carrier. This idea is supported by the questionnaire results where “Transit times” showed low importance for K+N, with 4,5% of points, and all other carriers, with an average of 7,5% of points.

Besides “Transit times”, the other aspects received a balanced amount of points (Table 6), which supports Foster and Strasser (1991) idea that the criteria for selection should be considered as a package. “Reliability in picking and delivery times” showed to be the most important aspect for K+N with 22% of the points, followed by “Cost” with 19% of the points. Thus, it can be concluded that the researched 3PL is mainly looking for a reliable carrier that, at the same time, is capable of offering a low price. This result is similar to the literature review, where “Cost” has the first place and “Reliability in picking and delivery times” takes the second place (Table 2).

Patterson et al (2010) found 3PLs more sensitive to cost and on time reliability and less sensitive to damage risks. This is supported by the questionnaires’ results since “Reliability in picking and delivery time” had 22% of points, “Cost” had 19% of points and “Damage Risk” had 13% of points.

Considering the reality in Sweden, seasonality is an important aspect for carrier choice pointed out by K+N Branch Manager, Business Developer, Freight Forwarder 1 and 2 (2018) and it did not shown relevance in the literature review. During the summer, the company has difficulties to find carriers with available capacity and the preference is given to the ones that are able to

transport the desired volume. The interviews with carriers indicate that such constraints are usually related to capacity on trailers for road transportation. Other modes, as rail and short-sea, seem to not lack space during the summer.

Zsidisin et al (2007) defends that a close relationship is beneficial to the willingness to commitment of assets during periods of shortages. This idea is partially supported by Carrier 4 and 5 once they affirmed to designate their trailers to long-term clients but also Carrier 5 signalized the willingness to pay more as a relevant aspect.

The selection criteria pointed out by carriers was different from the proposed by Dobie (2005). The author indicated that timely loads, volume to justify the cost-to-serve, efficient use of the carrier's freight equipment, and well-packed goods to reduce damage is important. The interviewed carriers are looking for other characteristics such as clients that are willing to have a close relationship to discuss problems, be understanding and send all the necessary information. It is also shown to be important to have companies as clients with a good financial situation.

5.2 Coopetition

Cygler and Debrowska (2015) outlines technological position and size as important aspects for preference for alliances with coopetitors within logistics sector. K+N is heavily investing in technology and it is between the largest 3PLs worldwide (Kuehne + Nagel, 2018B), which puts the company in a good place to negotiate with the best carriers.

Yong et al (2014), Resende et al (2018), Schreiner et al (2009), Faems et al (2010), Tsai (2012) and Schmoltzi and Whu (2012) highlight the importance of governance mechanisms for coopetition relationships. Those mechanisms can be divided between formal and social (Kale and Singh, 2009; Schreiner et al, 2009). Regarding formal mechanisms, K+N Business Developer (2018) affirms to establish only rates definitions on its contracts, however lacks more information regarding agreements standard of operations and expected behavior of each part.

Concerning social mechanisms, it can be concluded from all the interviews with Carriers that most of communication is made by email. Occasionally employees from both companies talk over the telephone. Usually face-to-face interaction does not occur. No carrier could point out during the interviews a situation when employees from both companies had met in person. The lack in communication toughens the possibility of existence of social mechanisms.

Furthermore, it is believed that the “Gentleman’s agreement”, explained in Chapter 4.7, seems to be a strong and known social mechanism in the 3PL industry in Europe. Kale and Singh (2009) affirm that such mechanism may substitute a formal control, which seems to precisely explain the relationship where the non-verbalized agreement substitutes a formal contract for both parts.

The “Gentleman’s agreement” appear to be supported by statements of Carrier 2 and 4. At first, Carrier 2 explains the transparent attitude that can be expected in case of an approach coming from the Large Swedish Exporter. Thereafter, Carrier 4 affirms that they will not approach a specific client of K+N, although both companies are free to compete for other customers. Bengtsson et al (2000) supports the “Gentleman’s agreement” as a good practice for cooperation when it was affirmed that for such relationship to be established and maintained both behaviors, competitor, and cooperator, should be split.

The carriers are responsible for transporting the client’s loads for K+N and such service can be concluded that has proximity with the customers. Therefore, according Bengtsson et al (2000) the relationship between K+N and the carriers suffers from a considerable level of competition. Different from Lindstrom and Polsa (2015) who consider logistics as an input activity, which occurs far from the customer, from a 3PL perspective, such activity can be considered output for taking place close to the customer.

Lindstrom and Polsa (2015) also explains that heterogeneity of resources may be a competitive advantage and also promote cooperation. This motivation precisely describes K+N and the Carriers. K+N has warehouses in Sweden and the UK, technology, market knowledge and the client. Therefore, the carriers have the transportation chain through road, rail, and short-sea. None of the Carriers owns warehouses in Sweden and only Carrier 2 has one warehouse in the UK.

5.3 Gap analysis between K+N and the Carriers

Two different questionnaires to evaluate the important aspects of a carrier were executed. At first, fourteen employees of K+N distributed points considering the most important aspects when choosing a carrier. Thereafter, the similar task was also required from the carriers which was to distribute points proportionally to the aspects they put more efforts to fulfill.

It was calculated the Euclidean distance between the answers given by the different carriers, considering K+N answers as the baseline. It was not considered different weights for each position of the rank; however, the gap was measured based on the same aspects. Close distribution of points made by K+N and carriers supports Foster and Strasser (1991) affirmation that aspects should be considered as a package, therefore the same approach was taken to this analysis. The results are presented in the Table 8. The complete calculation can be found in the Appendix 8.4.

Carriers	Distance
4	4,24
1	5,32
3	5,33
5	6,83
2	8,01

Table 8: Distance of points between carriers and K+N

In order to complement a qualitative approach, a quantitative method was executed. The objective of the questionnaires is to analyze quantitatively the aspects most commonly pointed out in the literature review. However, the aspects seasonality and cooperation, related exclusively to the universe of 3PLs in Sweden, were not considered.

Carrier 4 has the lower distance between the points given, however they suffer from constraint in capacity when K+N needs a high demand. On the other hand, Carrier 1 has the second place and no capacity constraint. The similarity on the aspects that both companies consider important may be one of the reasons for Carrier 1 be responsible for the higher transported volume of the Large Swedish Exporter. Additionally, Carrier 3 has a very close result to Carrier 2 and no capacity constraint which may indicate a good company for an alliance.

6.0 Conclusion

This chapter summarizes the key findings of this study which answers the research question. It is also suggested some practical improvements for the company K+N with focus in the client the Large Swedish Exporter. In conclusion, it is highlighted future research topics.

6.1 The Research Question

This master thesis studied the important aspects for third-party logistics when allying with carriers. In order to get a better understanding, a case study with the company Kuehne + Nagel focusing on one of its clients, the Large Swedish Exporter and differently carriers that the company commonly work with was performed. The following research question was proposed to guide the study: *“What is an appropriate approach to choosing alliances with carriers from Kuehne + Nagel in Sweden perspective?”*.

Different research regarding carrier choice was analyzed and the most common aspects were ranked. The terms “Cost”, “Reliability of delivery and picking times”, “Transit times”, “Ability to deal with unexpected”, “IT data capabilities”, “Customer relations” and “Damage risk” were chosen as a framework to be tested from a 3PL perspective. Past studies about the complex cooperative relationship between companies were also presented.

When choosing an alliance with a carrier, 3PLs seems to consider the aspects as a package, a carrier needs to simultaneously fulfil several different requirements to be a good fit. The highest importance was given for the aspect “Reliability in picking and delivery times”, followed by “Cost”. On the other hand, the aspect “Transit Time” did not show relevance for 3PLs and may be explained by Patterson et al (2010) statement that the duration of the shipment is a route characteristic and does not rely in a specific carrier.

Besides what was pointed out in the review literature, “Ability to deal with seasonality” and “Coopetition relationship” have shown to be important aspects when a 3PL is allying with a carrier. Such aspects seem to be a common concern in Sweden and are also perceived by the carriers.

The “coopetition relationship” between K+N and the carriers suffers from a high level of competition because their services occur with proximity to the customer. This type of relationship can be dealt with operational and structural governance mechanisms. Besides the “Gentleman's agreement” explained by the Business Developer of K+N (2018), the company did not seem to have any other governance mechanism.

Finally, it was shown that 3PLs may differ from other companies when choosing a carrier. Besides the aspects pointed out by other authors, for this sector the “Ability to deal with seasonality” and the “Coopetitive relationship” is also relevant.

6.2 Practical Suggestions for K+N

In this chapter practical improvements for the problems pointed out by the company Kuehne + Nagel and the client called “Large Swedish Exporter” are suggested.

6.2.1 Seasonality

The client has a higher demand from March to July and November and K+N employees stated during the interviews to have difficulties to find carriers that are available to transport those volumes during this period. In this section, two alternatives to deal with the problem are suggested; different pricing for the client or negotiate no cost for cross-docking with Carrier 1.

Different pricing for the client

Carrier 1, 2 and 3 affirmed to rarely suffer from capacity shortage since the part of the route using trailers is not too long. When questioned the reason for sending the shipments by trailers the employees of K+N argued that it was, most of times, as a result of a high total weight. Certainly, it exists a limit of weight and different rates established by each carrier (Table 5).

It is possible to hire Carriers 4 and 5 to send shipments to a limit of 27 tons but sourcing on spot is not the strategy preferred by those carriers. They value long-term clients and give the priority to them and to who is willing to pay more. In consequence, the rates for K+N during the summer are usually higher than the company expect to pay.

The rate paid by the client to K+N is independent of the route, carrier, or tonnage of loads. Therefore, it is an expected behavior from the client to fill up the loads till the maximum tonnage allowed in order to increase its financial performance. In order to avoid such behavior, it is suggested to propose two different rates to the clients based on the total weight of the shipment, a lower rate for under 25 tons and a higher from 25 to 27 tons.

The client may disprove this strategy. Therefore, the possibility of a lower rate than practiced nowadays for shipments under 25 tons should be analyzed. On the other hand, for shipments from 25 to 27 tons, the rates should be high enough to cover the cost of sending by trailer and still be profitable for K+N. The increase of shipments carried under 25 tons with Carriers 1, 2 or 3 is going to facilitate the operation for K+N staff in Sweden and for the carriers and a lower cost. K+N

Business Developer (2018) affirmed that clients in Scandinavian are usually interested to reduce the emission of gases of its transportation chain. Therefore, it can be argued to the client that shipments under 25 tons will have lower environment impact and will also be cheaper.

Negotiate no cost for cross-docking with Carrier 1

It is understood that the rates practiced nowadays already have a low profit margin and may not have space for a different pricing, so a second suggestion was also developed.

Carrier 1 affirmed to be able to transport heavy loads if cross dock is performed. This service usually has an extra cost, but Carrier 1 signaled in the interview that for K+N it may be possible to negotiate with no cost. K+N should consider having a face-to-face meeting with the Internal Sales Person of Carrier 1 located in Gothenburg to understand how this new solution works and negotiate it with no extra charge for K+N. It should be analyzed if this option will incur an extra cost after cross-dock for a second trailer and longer transit times. This suggestion will cope with the unavailability or high price of the road carriers during the period but overall costs should be observed.

Therefore, instead of trailers, during the high season loads can be sent preferentially with the following carriers:

- Till 25 tons → Carriers 1, 2 and 3
- Till 26,5 tons → Carriers 1 and 2
- Heavier than 26,5 tons → Carrier 1

As a drawback for this solution, it needs to be considered that increase the volumes carried by Carrier 1 may also increase the dependency in the alliance and the risk of losing the client for Carrier 1.

6.2.2 Coopetition

It exists a mixed relationship of cooperation and competition between K+N and the carriers they alliance with. Some practical improvements to deal with such complex interaction are suggested in the sections below.

Governance Mechanisms

Based on the literature review, K+N is investing in technology, is one of the 3PL market leaders and has a heterogeneity of resources. Therefore, it is the type of company that coopetitors look for in an alliance. Based on the interview with carriers, K+N also fulfill an important characteristic, namely to be financial stable. On the other hand, the carriers also pointed out that it is important to have a close relationship with the clients. K+N do not seem to promote personal interaction between employees of the company and the carriers.

Based on the literature review, K+N should consider investing in different governance mechanisms to deal with the coopetitive relationship. As structural governance, the one incorporated during the design of the alliance, the relationship should be established based on formal mechanism. It is suggested to develop a contract that describes the responsibilities and the expected behavior from both parts in the coopetitive agreement. In response to the settled alliance, the carriers commit to do not compete with K+N for the clients they are carrying the shipments.

Regarding the operational governance, it is believed that social mechanisms are important to maintain a coopetitive relationship. K+N should consider organizing different events with each

carrier's employees and members of the sea freight department. (Eriksson, 2010). The event can take place in their office in Gothenburg, with activities that boosts the interaction between people, expose operational difficulties and propose solutions for improvement of the relationship.

Considering long-term relationships, Foster and Strasser (1991) defends the importance of a rewarding system focused on the true goals of the company. K+N should consider a reward mechanism, when objectives of the company are fulfilled, as transporting the necessary loads during the high season, picking, and delivering the shipments in the stipulated times, great customer service, handling well unexpected events, between others. The rewards should be directed at the employees inside the carriers that work directly with K+N, taking into consideration the carriers' code of conduct. An example of rewards are cinema tickets or gift cards for stores or restaurants.

Balance volume distribution

During the interviews all the carriers affirmed to be able to perform a diversity of services that characterize them as 3PLs. All the companies are looking for the same clients, in the same regions. The main attention should be paid to Carrier 1 and 2. Besides both companies possess the assets for transportation, Carrier 2 also owns one warehouse in Sweden and held the second largest volume transported in 2017. Carrier 1 does not own any warehouse in UK or Sweden but held the largest volume in 2017. The governance mechanisms suggested in the section before should be mainly considered to deal with the competition with Carrier 1 and 2.

Besides the risk of losing the client, high volumes cause interdependency between the companies (Dagnino and Rocco, 2009). K+N should evaluate the transportation performed by Carrier 3 and the possibility to rise the volume shipped by them from south of Sweden. The results of the questionnaire answered by Carrier 3 shows that both companies value relevant aspects for the shipments with similar intensity and have potential for working well together. Additionally, in order to balance the volumes, K+N should consider designating more shipments to Carrier 2.

6.3 Future Research

The research was performed with focus in only one K+N client. This client has shipments that are usually FCL and has the possibility of transportation through multimodal solutions. Therefore, the preference for carrier attributes may differ if it is researched the operations of a different client. It would be relevant to have a different perspective from different clients inside K+N.

Due to time restriction only one 3PL was analyzed in this study. Consequently, a relevant future study may be the comparison of other 3PLs in Scandinavian and the important aspects for them. Thereafter, it can be concluded that the behavior in choosing carriers may change in different parts of the world. Therefore, it would be relevant to perform similar studies outside Scandinavia and compare the results.

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8.0 Appendix

8.1 Semi-Structured interview guide for Carriers

- Tell me a bit about what you do inside your company
- When your company handles a shipment, which requirements you make sure to fulfill?
- Which characteristics are important for a client to have to be a good client for you?
- During the summer, when there is a large demand and a shortage of vehicles. How your company choose the clients? Who gets the vehicles?
- Thinking about the demand from the Large Swedish Exporter, what are the main difficulties regarding the shipments?
- What type of services your company can offer to a client? Door-to-door solution? Intermodal transportation? Warehouses?
- Is it the interest of your company to have long-term clients? What are the important aspects when developed a long-term relationship with a client?
- How important you see personal interaction with the clients?
- How your company see K+N? As a client? As a competitor? Do you see a mix of both? Why?
- How do you interact with K+N? Emails, phone calls, in person? How well do you know the person that is the point of contact at K+N?

8.2 Points Allocation Questionnaires - Carriers

Taking into consideration your clients, distribute different amount of points depending on the importance you give for each aspect below. Which of the services would you put more efforts to give to a client? You need to distribute a total of **40 points**.

- Do not bother if some statements sound similar to you, this is part of the research.

Statement	Points
Assure that the products will be delivered without any damage	
A discount in the total price to the client	
Ability of making changes in the last minute	
Give personal attention to the customer, answering all the request and finding a personalized solution for them	
A low price	
Assurance that a product will be picked up and delivered in time according to the agreement	
A route with a reduced transit time	
Offer electronic access to information about the shipment	
Avoid delays in the delivery of the shipment	
Answer fast calls, emails, and other communication	
Offer real-data of the shipment through interconnected IT system	
The products will be delivered with no missing or broken parts	
Deliver the shipment before than other carriers	
Ability of solving unexpecting problems	

! Please sum all the points to make sure that all **40 points** were distributed!

8.3 Points Allocation Questionnaire - Kuehne + Nagel

Distribute different amount of points depending on the importance you give for each aspect below when choosing a carrier. You can distribute a total of 40 points

- Do not bother if some statements sound similar to you, this is part of the research.

Statement	Points
Get products delivered in perfect condition, do not receive broken products.	
Get a discount in the total price	
The ability of a carrier deal with last minute	
Receive personal attention, answers to all requests and know that the carrier put efforts to find a personalized solution.	
A low price	
Assurance that a product will be picked up and delivered in time according to the agreement	
A route with a reduced transit time	
Have electronic access to information about the shipments	
Avoid delays in the delivery of the shipment	
Receive fast answers to calls, emails and other communication	
Have real-data of the shipment through interconnected IT system.	
Know that the products will be delivered without any damage or missing parts	
Delivery of the shipment before than usual routes	
The ability of a carrier to solve unexpected problems	

! Please sum all the points to make sure that all **40 points** were distributed!

8.4 Calculation of the distance between carriers and K+N

The Distance Formula

$$d(x,y) = \sqrt{\sum_i^n (x_i - y_i)^2}$$

Difference Squared of each aspect using K+N as index

Carriers	Customer Service	Damage	Picking and Delivering in Time	IT	Deal with unexpected	Price	Transit Times
3	9,00	3,46	3,17	1,66	0,61	9,00	1,49
5	4,00	23,62	0,05	2,92	0,05	16,00	0,05
1	4,00	1,30	3,17	0,50	4,93	4,00	10,37
2	9,00	23,62	3,17	7,34	4,93	16,00	0,05
4	4,00	0,02	1,49	0,50	1,49	9,00	1,49

Sum of the Squares and Route of the sums

Carriers	Sum of squares	Route of Sums
3	28,39	5,33
4	46,69	6,83
5	28,27	5,32
1	64,11	8,01
2	17,99	4,24