UNIVERSITY OF GOTHENBURG
SCHOOL OF BUSINESS, ECONOMICS AND LAW

MOVING FORWARD IN INDIA

An Analysis of IKEA's Indian Distribution Network Development

Master's Thesis in Logistics & Transport Management

Gunnar Löfstedt

Supervisor: Johan Woxenius

Graduate School

Date: 27 May, 2018

Abstract

Warehouses and distribution centers form an integral part of the supply chain. However, determining how many are needed to effectively supply a market is a complex question. This is especially true when entering a new market. IKEA has long been a company heavily focused on efficient logistics operations and is set to enter the Indian market in November 2018. This thesis identifies the main differences impacting distribution between the European and Indian market and investigates how these differences can impact IKEA's distribution strategy in India. To conduct this case study, several in-depth interviews with IKEA personnel based in both Europe and India were conducted and their answers were contrasted to the existing literature base. Additional comparisons were also made with another interviewee from the private freight transport sector in India. The findings revealed that while there are similarities between the European and Indian market in terms of geographical size, potential local sourcing and ownership structure, there are significant differences in terms of available infrastructure, land acquisition, and state legislations. The result is that deliveries in India are much less reliable from a time standpoint which would suggest the need to pursue a decentralized distribution strategy.

Acknowledgements

First and foremost, I would like to thank my supervisor Johan Woxenius for his support and feedback throughout the thesis. Secondly, I would like to thank my former manager Anders Lindqvist for providing help and inspiration in this project and for the recommendations of whom to contact for interviews. Special thanks are also extended to the interviewees who partook in this project and provided invaluable insights. Without their aid, the project could not have been completed.

Abbreviations

3PL – Third Party Logistics Provider

CDC – Central Distribution Center

DC – Distribution Center

DDC – Decentralized Distribution Center

FDI – Foreign Direct Investment

ICD – Inland Container Depot

MNC – Multinational Corporation

NDC – National Distribution Center

RDC – Regional Distribution Center

Table of Contents

List of Figures

1. Introduction

In this chapter, the general background and the case company will be introduced. The problem, purpose, and research gap along with the research question will also be presented.

1.1 Background

Warehouses or distribution centers (DCs) have long formed an essential part of a supply chain. Over the years, the size and functions of DCs have changed significantly. In the early 20th century, most DCs were smaller warehouses which stored finished goods. Today, they take a wide variety of forms depending on the type of goods flowing through, the region in which they exist, and purpose. However, in addition to the function they fill, there are also a wide array of differences between different countries. Though there is a substantial amount of work dedicated to the development of distribution networks, with particular focus on the European and US context, the amount of literature focusing on the developing nations, such as India, is limited (Ng & Cetin. 2012).

Ever since India joined the World Trade Organization (WTO) in 1995, it has gradually liberalized trade legislation to attract more Foreign Direct Investment (FDI). Naturally, with its large domestic market abundance of cheap labor many have been viewing India as the next market to invest in. However, while growth rates have remained fairly high since the early 1990s, they have not reached the levels seen by countries such as China. As a result, the total GDP of India has remained comparatively low (Dash & Sharma, 2011). There are several explanations about why GDP growth has been slower than what many hoped for. Despite opening its market to FDI, foreign companies have faced many challenges in India. One of the most common challenges relates to the poor state of the national infrastructure. Indeed the positive correlation between infrastructure development and GDP growth has been established and confirmed by several authors including Simon & Natarajan (2017). The challenges related to the state of the infrastructure undeniably impacts the logistics costs.

However, there are also other challenges which stem partly from the sheer size of India. Due to the numerous states of India there are a wide array of different laws which impact business operations. Previously, each state had their own form of taxation which led to a very complex tax structure for companies operating in several states. Though this has been addressed with new legislation and introduction of the Goods and Services Tax (GST) in 2016, other hurdles remain, especially in regard to infrastructure needs and land acquisition (Haralambide & Gujar, 2011. Deloitte, 2014. Sunitha & Chandra, 2017). All these factors have a direct impact on the

distribution strategies of companies. These challenges will likely also be faced by the Swedish furniture retailer IKEA which is in the process of establishing itself in the Indian market, with its first store opening in Hyderabad later in 2018.

1.2 Case Company Description

Efficient logistics operations have been at the heart of IKEA's operations ever since it was founded in 1943. This logistics focus eventually led to the development of one of the most defining characteristics of the company, the unassembled furniture in space reducing flat packaging (Klevås, 2005. Wever, 2011). This focus has also been mirrored in its use of transport. IKEA has a history of utilizing intermodal transport in Europe primarily in efforts to reduce transport pollution. Though IKEA's own rail service was discontinued in 2004, intermodal transport is still utilized to this day in combination with long distance trucks (Roso, Woxenius & Olandersson, 2006). Early on, IKEA was also able to utilize the benefits of international sourcing. With the Swedish suppliers primarily supplying competing furniture retailers, IKEA expanded its sourcing base abroad to countries like Poland which was geographically close and had more affordable labor. These factors would eventually form an integral part of IKEA's strategy as they expanded. Today IKEA is the world's largest furniture retailer with 403 stores in 49 countries. 275 of these are located in Europe, 56 are located in North America and 47 stores are in Asia (Inter IKEA Group, 2017). The company also has approximately 1220 suppliers in 55 countries including Poland, Sweden, France, Russia and China (IKEA, Purchasing, 2018. IKEA Industry, 2018). Though Europe accounted for approximately 81% of IKEA's turnover in the early 2000s, other markets have grown over the years (Johansson & Thelander, 2009). As of 2018, Europe accounted for approximately 75% of the market.

The global supplier network means that in order to be able to deliver the products to the stores, there needs to be an efficient distribution network. After the first Indian IKEA store opens in 2018, the aim is to open 25 stores in India by 2025 with Mumbai, Bangalore, New Delhi Chennai, and Gurgaon earmarked as primary areas (Govind, 2017. Jain, 2017. Financial Express, Nov, 2, 2017). Currently much of the distribution network is only in the planning stages. However, IKEA already has several suppliers in India with whom they have collaborated with over the past 30 years. These connections will likely play an increasingly important role as IKEA expands production in India to meet the 30% required production volume established by the Indian government. Meanwhile, the remaining 70% will still be imported from abroad (IKEA India, 2018. Malviya, 2018). Naturally there are a wide array of

challenges that require attention. With the aim to rapidly expand their position in the Indian market, the distribution network needs to be able to facilitate timely deliveries to the stores. This is particularly challenging in a market notorious for the poor state of its infrastructure as well as multiple other challenges that can stall progress.

1.3 Problem

In recent years, the number of companies relying on centralized distribution centers (CDCs) has increased substantially. The main reason for pursuing such a strategy is to cut costs (McKinnon, 2009). However the downside with this strategy is that companies are instead increasingly reliant on one location and good connectivity. Whereas this may not be too problematic in North America or Europe this may not be true for other parts of the world. With its growing economy, massive population and low labor costs, many companies such as IKEA are eyeing India as the next market to enter. However, India is renowned for the poor state of its infrastructure and high amount of bureaucracy (McKinsey & Company, 2010. Deloitte, 2014). Since IKEA is a logistics focused company, these challenges are particularly relevant as they will have a direct impact on the effectivity of IKEA's distribution and warehousing.

1.4 Purpose

The purpose of this research is twofold. First and foremost, the aim is to determine to what extent the existing theoretical framework about distribution centers can be applied in an Indian setting and what the key differences are between India and the western hemisphere, primarily Europe. The aim of this paper is to expand on the current literature base by providing a case study about this topic. Secondly, the aim is to produce insights that can be utilized by IKEA when developing their operations in India.

1.5 Research Gap

Though plenty of research about distribution centers has been conducted such as that of McKinnon (2009) Cidell, (2010) and Rushton, Croucher, & Baker (2014) most of these studies have been conducted in either North America or Europe. The amount of research focusing on India is currently limited as noted by Ng & Cetin (2012).

1.6 Research Question

In order to appropriately study the phenomena, the following research question will be studied;

How can IKEA develop their distribution network in India compared to how it is in Europe?

In order to answer this question, there are several sub questions that need to be addressed. These are as follows:

1. Is there a notable shift in IKEA's ownership structure between Europe and India?
2. How do local governments impact IKEA's warehouse location selection in Europe and India respectively?
3. How do differences in infrastructure and freight transport in the European and Indian market affect IKEA?
4. How many distribution centers will IKEA use to serve the Indian market compared to the European market?

1.7 Scope

Since this is a single case study, the scope of this paper is limited to IKEA's distribution in the European and Indian market. While the aim is to expand on the existing literature base by providing an in-depth case study with results that are applicable in other situations, it is acknowledged that certain findings may be specific for the case study company and the industry it operates in. Nonetheless, the factors analyzed should provide insights to the limitations of the Indian market and aid future research within the academic and professional communities. It should also be acknowledged that this thesis is using the perspective of a western company entering the Indian market. As such, there are certain limitations in the scope. In addition, the intention of this study is not to create new theories but merely apply existing theories in a different geographical context.

2. Methodology

In this chapter, the methodology used to produce this thesis will be introduced and explained. Thereafter, the reasoning behind the method selection will be examined and further elaborated.

2.1 Research Approach

First and foremost, it has been argued that a researcher should clearly define what research approach will be applied as this impacts the type of data that will be collected. The two dominant options to decide between are qualitative or quantitative studies. Qualitative studies rely on non-numerical data as sources for information whereas quantitative studies rely primarily on numerical data as sources (Saunders, Lewis, & Thornhill, 2009). Since this thesis is aimed at comparing the distribution strategy of IKEA to existing literature, the qualitative research method was selected. It was also argued that the qualitative method is best suited for

researchers attempting to create or expand on existing theories from the data and information gathered (Saunders, et al. 2009).

2.2 Scientific Philosophy

Among researchers, there are three primary scientific philosophies: positivism, interpretivism, and hermeneutics. As positivism is closely linked to mathematical analysis and inferential statistics and is primarily used within the natural sciences, it is not particularly suitable for this research (Lee, 1991. Saunders, et al. 2009). Interpretivism focuses more on the relations between different people and the role that each of them play (Saunders, et al. 2009). In contrast, hermeneutics focuses entirely on textual analysis and is most commonly used among researchers studying differences in language (Butler, 1998). Therefore, it is not particularly suitable for those studying the operations of a company.

Furthermore, those who use the interpretivistic philosophy typically rely on fewer, but more in-depth interviews than many of the other philosophies (Saunders, et al. 2009). Due to the qualitative nature of this study this philosophy was considered to be the most suitable.

2.3 Scientific Approach

There are three main scientific approaches. These are identified as, inductive, deductive, and abductive (Dubois & Gadde, 2002. Saunders, et al. 2009). An inductive study is made by first gathering information and thereafter tying these findings to a theory (Locke, 2007). This approach of case study methodology was also referred to as Theory Generation by Ketokivi & Choi (2014). As indicated by the name, this approach is best suited for researchers attempting to produce new theories. Since this is not the purpose of this thesis, the inductive approach was not chosen.

In a deductive study, on the other hand, researchers begin with a model or theory as a base which the observations and findings are compared to. The deductive approach has been criticized due to the limited amount of suggestions about how that type of research would be conducted (Barratt, Choi, & Li, 2011). However, other authors have argued that the deductive approach is highly suitable for qualitative case studies when the point is to either confirm or falsify an existing theory (Locke, 2007).

An abductive study utilizes systematic combining which is a process of continuously combining the theoretical framework and the empirical information in order to produce a hypothesis (Baral, 2000. Dubois & Gadde, 2002). The abductive approach has been argued to be particularly suitable for research that utilizes case studies as a research strategy due to the unique

opportunities that case studies provides researchers to develop theories (Dubois & Gadde, 2002). It has also been argued that the abductive approach is best suited if the purpose is to use an existing theory and expand on it (Ketokivi & Choi, 2014).

Since this thesis investigates IKEA and their operations in India, this thesis will utilize the case study research strategy, which will be explained in greater depth in Chapter 2.4. Since the purpose is to apply a set of theoretical assumptions in a new context, here India, the abductive approach was found to be most useful.

2.4 Research Strategy

Since this paper aims to compare a theoretical framework with the findings from a company the case study research strategy was selected. While this strategy has been criticized by several authors for lacking a clear approach and guidelines of how to apply the strategy, is has also been argued that since each case is unique, a clear set of guidelines that would be applicable in all circumstances would be difficult to develop (Eisenhardt, 1989. Stake, 1995). In order to address this issue, Stake (1995) developed three categories of case studies. These were defined as: instrumental, intrinsic, or collective case studies. An instrumental case study is defined as a case study in which a case company is studied in order to produce insights that are applicable in several contexts. This is in contrast to the intrinsic case study which only aims to produce insights that are applicable in that particular context. A collective case study, on the other hand, is a case study that has several focus points, e.g. multiple companies or individuals. While this paper utilizes information from numerous sources and interviewees, there is but one company that serves as the focus of the thesis the aim of which is to produce insights which are applicable to other companies. As such, this case study is an instrumental case study.

2.5 Data Collection

2.5.1 Case selection

One of the key requirements of an instrumental case study is that it can provide insight into a particular issue. As previously mentioned, IKEA is an international Multinational Corporation (MNC) which is in the process of establishing itself in the Indian market. Many other western MNCs are also attempting to establish themselves in the Indian market due to its growing economic strength and consumer demand. In addition, IKEA is a highly relevant company to research due to its emphasis on efficient logistics operations, which is the focus of this thesis.

A key criteria mentioned by Stake (1995) relates to accessibility. In order to produce a case study, the author needs access to interviewees as well as other information from that company.

In this instance, the reason why IKEA was selected as a case study company was due to the researcher's previous work experience at there. Therefore, the researcher was in a unique position to utilize these previous experiences and contacts made to gather the relevant material, conduct the relevant interviews and produce this thesis. Additional information regarding logistics operations in India were gathered through a field trip to Bangalore, where IKEA's Indian Corporate Offices are located. Face to Face interviews were conducted with both IKEAs Distribution Operations Manager and a board member of an Indian trucking company during this trip.

2.5.2 Interview Method

The two primary interview methods are labelled as either structured or semi-structured. The main difference between the two interview methods is that in a structured interview, the interviewee is not allowed to deviate from the topic whereas in a semi-structured interview, the interviewee is allowed to deviate and more freely expand on the questions asked (Saunders et al. 2009). In order to gain access to more of the insights that the interviewee may have, the semi-structured method was chosen.

A combination of face to face interviews, interviews via skype and follow up interviews via email were conducted. The interview guides can be found in the appendix, 10.1 and 10.2. The process of conducting interviews via email have been criticized due to the possibility of missing certain information since it is difficult to interpret tone or expression (Lee, 1994). Another critique is that the time lag between question and answers may result in unfocused answers and limits the possibility to ask follow up questions (James & Busher, 2006). This is especially relevant when the semi structured interview method is chosen. However, by combining face to face interviews and interviews via skype, some of these issues can be addressed. Though it will not be possible to observe body language when conducting email interviews, it has been argued that the tone of the interviewee can still be understood, especially if there have been face to face interviews previously (Lee, 1994).

Interviews were conducted with 4 interviewees. The interviewees were selected based on their familiarity with the topic and on the recommendations from other interviewees. This is referred to as networking or snowball sampling by Collis & Hussey (2013). An interviewee from outside IKEA was interviewed in order to gain additional viewpoints. This interviewee was selected based on their knowledge of the topic and previous associations with the author. The titles and the type of interview each interviewee participated in are outlined below:

Interviewee Name (as denoted in thesis)	Position	Number of Interviews and Interview Method
Interviewee 1	Distribution Operations Manager - IKEA India	1 Interview via Phone 1 Interview via Email 1 Interview Face to Face
Interviewee 2	Multi-Channel Network Design & Implementation Manager -EU	1 Interview via Phone
Interviewee 3	Global / EU Network Distribution Design Manager	1 Interview via Skype
Interviewee 4	Member of company board -Private trucking company in India	1 Interview Face to Face

Table 1. Summary of Interviews and Interviewees

2.5.3 Secondary Data

Lumsden's framework (2006) of factors impacting warehouse and DC location served as the basis of what secondary information to gather. A wide array of academic articles were selected based on relevance, impact factor, and times referenced. These articles were complimented with several newspapers articles as well as case studies produced by several leading consulting firms. These sources were used to obtain up-to-date information as well as in-depth studies about specific subjects for which there was a lack of academic research, such as a study comparing local attributes for warehousing across the largest cities of India.

The articles focused primarily on general infrastructure and infrastructure development in India and Europe. Issues related to land acquisition were also studied and a wide range of articles about warehouses & DCs and different types of ownership were studied as well. To find relevant articles, google scholar was used extensively in combination with course material gathered during graduate studies in Sweden and India.

2.6 Method for Data Analysis

Though there is no standard format to apply when analyzing information gathered in a case study there are several recommendations that researchers can apply. One of the methods Saunders, et al, (2009) recommend a researcher undertake is to write short summaries of the key topics. It was argued that this would help the researcher find similarities and differences between the different sources of information. This step should be complemented by transcribing the interviews in order to help highlight some of the key themes (Saunders, et al. 2009).

Similarly, Collis & Hussey (2013) suggested the following three steps when analyzing data (Pg. 157):

- "Reducing the data
- Displaying the data
- Drawing conclusions and verifying the validity of those conclusions"

The first step of reducing the data involves simplifying and restructuring the data that has been gathered. This can be done by "using a pre-existing theoretical framework or one that emerges during the data collection stage to provide categories into which the data can be fitted" (Collis & Hussey, 2013. Pg. 159). Once the interviews were transcribed, fitting the information into the relevant categories introduced in the literature review was straightforward. Using similar categories also makes it easier to display the data in a manner that is easy for the reader to follow. Likewise, Eisenhardt (1989) argued that once a sufficient amount of primary information has been gathered from the case company and secondary information from literature, the researcher should study them until distinguishable similarities appear.

2.7 Research Trustworthiness

2.7.1 Reliability

For research to be deemed trustworthy and of scientific value, it needs to be both reliable and valid. A study which is not reliable can, by definition, not be valid. In order to produce a reliable study it is recommended to answer the following three questions (Easterby-Smith *et al*. 2008. Pg. 109. In Saunders, et al. 2009. Pg. 156):

1. "Will the measures yield the same results on other occasions?
2. Will similar observations be reached by other observers?
3. Is there transparency in how sense was made from the raw data?"

In relation to the first question, it is important to consider the interviewees that are selected. A particular employee may have very different opinions and answers from their colleagues and may respond differently depending on the circumstances. The time of the day and the day of the week can all impact the interviewee's mood and response (Saunders, et al. 2009). One of the easiest ways to tackle this issue is to conduct several interviews at different times with the same interviewees.

Since this study is conducted by a single researcher, questions regarding bias must be addressed. This is referred to as observer bias and relates to Question 2. One way to reduce observer bias

is to have other colleagues read through the questionnaire before the interview takes place and compare notes after the interview. Though this is a time consuming process it can help uncover potential faults or sources of bias for the researcher. Similarly having colleagues read through the study will also help in determining whether or not it is clear how the researcher understood and interpreted the raw data, as described in Question 3.

2.7.2 Validity

In terms of validity there are two types, namely, internal and external validity. Internal validity can be defined as: "the extent to which the findings can be attributed to the interventions rather than any flaws in your research design" (Saunders, et al. 2009. Pg 143). For qualitative studies, internal validity is directly impacted by the questionnaires produced for gathering primary data. Here, particular emphasis is placed on whether or not the interviewee understands the question to its fullest extent and whether or not the interviewer understands the information provided by the interviewee (Saunders, et al. 2009). The second aspect that must be considered when producing a questionnaire is that the answers will measure what the researcher set out to measure. One way of tackling this issue is to have several preparatory interviews with colleagues from both inside and outside an academic setting to determine if the questions are adequately comprehensible. In addition, the interviewees of this research also received copies of the paper before the publication to read and comment on. This is referred to as respondent validation by Gibbs (2007) and was undertaken to ensure that the answers provided by the interviewees were correctly understood by the researcher. There are also additional benefits to utilize respondent validation. If the interviewee was mistaken about certain information provided during the interview, they would have the chance to clarify and correct themselves. This is particularly important as the interviewer may have correctly interpreted the information provided by the interviewee but if the information provided was incorrect, it could impact the validity of the research (Gibbs, 2007). In addition, utilizing respondent validation could also impact the reliability of the study. If an answer was provided due to a specific circumstance, such as the time of day impacting mood, as mentioned in 2.7.1, the interviewee would now have the chance to either reword their answer or retract certain parts if the answers were the result of the circumstance at the time rather than fact.

External validity is commonly also referred to as generalizability and refers to the extent to which the findings produced in the study can be generalized for other studies. This is a particularly important aspect to consider when producing single case studies as the findings produced are based on a single company. However, proponents of the case study research

strategy have argued that it is not the sample in and of itself which is of primary concern but rather the findings produced (Barratt et al. 2011). Though it is not certain that the findings will be generalizable, this can be deduced by producing additional studies in the future (Saunders, et al. 2009).

2.8 Ethical Implications

Before conducting the study, there are multiple ethical considerations the researcher needs to make. In general it is recommended that the researcher: "should not subject those you are researching (the research population) to embarrassment, harm or any other material disadvantage" (Saunders, et al. 2009. P.g 160).

This also relates to the ethical issues raised by Blumberg, Cooper & Schindler (2005) on whether or not the findings in the research can be classified as good. The key argument was that research that produced more harm than good could not be justified. Due to the nature of this research, the primary costs would be related to the time the interviewees spent participating in the research as well as the potential material disadvantage. Since this is an in-depth case study about one company, there is a risk that the information produced herein could have been of classified nature. To avoid any material disadvantage, the interviewees were therefore allowed to read through the paper before publication. Though this raises the question of participant bias, this issue was tackled by discussing the contents in depth and negotiating which parts could be included and reformulated without being removed. Another point raised by Saunders, et al. (2009) relates to the issue of transparency. It has been argued that interviewees who are not informed of the purpose of the study may feel deceived or may even feel that the research can negatively impact them or their careers. Keeping true to this view all the interviewees were fully informed of the purpose of the study and the reasoning behind the interview questions. Furthermore, special care was taken to ensure anonymity for interviewees who requested it.

3. Theoretical Framework

In this chapter, the concepts of warehousing and distribution centers are explained and the two underlying inventory models in distribution networks are introduced.

3.1 Warehousing

The term warehouse has often been used interchangeably with the term Distribution Center (Higginson & Bookbinder, 2005. Rimiene & Grundey, 2007. Higgins, Ferguson & Kanaroglou 2012). However, there are some important distinctions to make. Even though the two terms are often used interchangeably there are several types of warehouses and the DC is just one of them, as Higginson & Bookbinder (2005) pointed out. Though this separation may seem trivial, it is an important distinction to make as early as possible before conducting further research due to the specific requirements each DC has. Higginson & Bookbinder (2005) divided up the modern DCs into seven categories according to the different key functions they filled. These were defined as: make bulk/break bulk consolidation center, cross-dock, transshipment facility, assembly facility, product fulfilment center, distribution center for returned goods and miscellaneous other roles. However, these separations can provide limited help at times since many DCs perform several functions, as Higginson & Bookbinder themselves pointed out (2005). Therefore, for the purpose of this study, it is more useful to rely on the definition utilized by Higgins, et al. (2012) which was initially developed by Notteboom & Rodrigue (2009). Here, they argued that DCs are logistics centers which provide 3 primary functions, (Higgins et al. 2012. Pg. 11):

1. "Transfers: the contents of maritime containers are transferred into domestic containers or truckloads.
2. Cross docking: the contents of inbound loads are sorted and transloaded to their final destinations.
3. Warehousing: a standard function still performed by a majority of distribution centers that act as buffers and points of consolidation and deconsolidation in supply chains"

This definition also closely matches that of Higginson & Bookbinder (2005) who stated that DCs are a supply chain node that serve to facilitate "storage of intermediate or finished goods; consolidation of orders; and transportation" (Pg. 43). DCs can be a variety of sizes depending on the products and the volume they have to handle. Naturally, the size of the market or the amount of sales impacts the volume that a DC has to handle, however, the distribution strategy utilized also has an impact. This will be studied in depth in the upcoming section.

3.2 Decentralized vs Centralized Distribution

There are two dominant inventory models for a supply or distribution network; decentralized or centralized distribution. Companies that rely on multiple locations for their inventory needs use a decentralized inventory model whereas companies that rely on a single location for their inventory needs use a centralized inventory model (Schmitt, Sun, Snyder & Shen. 2015). These two models will be studied and explained in depth in the following section.

3.2.1 Decentralized Distribution

If supply risk is a larger issue than demand risk, many companies opt for a decentralized inventory model. In this model, several locations serve as storage or distribution points in order to reduce supply risk. The logic is that if suppliers are unreliable for any reason, the risk can be mitigated by having inventory at several locations. This is referred to decentralized distribution centers or DDC and is related to risk diversification (Snyder & Shen, 2006. Schmitt, et al. 2015). For instance, if a region has two cities named City A and City B, and if the company supplying City A and City B were to have a high supplier risk, the company would be more likely to rely on multiple distribution locations, perhaps one in City A and one in City B, to decrease this risk. If there is a disruption in the supply to the warehouse in City A, the company will still most likely be able to serve City B as it has a separate warehouse (Schmitt, et al. 2015). Several factors impact supply risk such as production issues, weather (which may impact delivery times), administrative issues at the supplier's end, border controls and availability of transport. Generally speaking, the greater the distance between the supplier and DC or DC and the customers, the greater the supply risk (Zsidisin & Ellram, 2003). The term "supply risk" was also referred to as a company's "anpassningförmåga" by Lumsden (2006) and can be translated into adaptability. Another potential advantage to having several DDCs that was emphasized by Lumsden (2006) is that it can decrease total transport distances. Indeed, if a very large country is served entirely by one DC, the total transport distances will be very high. This relationship is shown below:
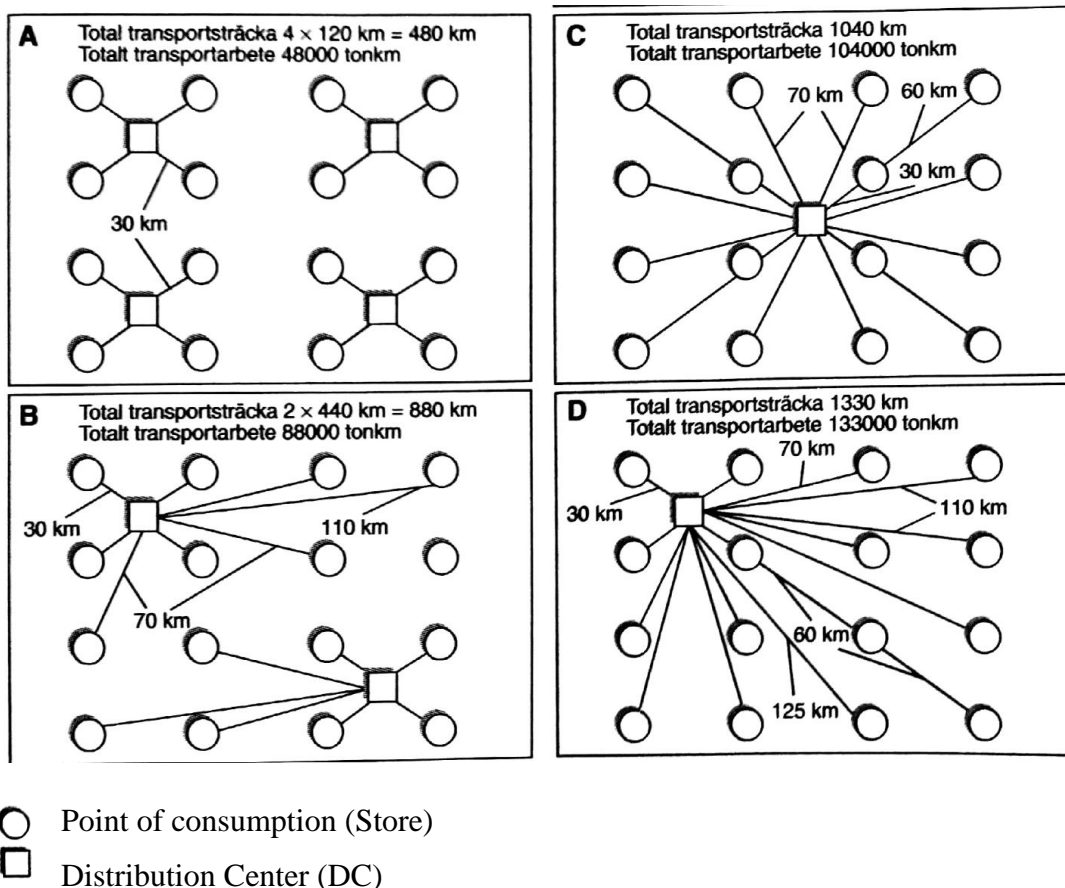
Figure 1. Transport Distances in Centralized vs Decentralized distribution. Source: Lumsden, 2006. Pg. 623.

○ Point of consumption (Store)

□ Distribution Center (DC)

Note: Total Transportsträcka = Total transport distance

In this scenario, it should be noted that the transport distances are primarily shorter for outbound goods, i.e. goods moving from the DC to the store. If we consider inbound goods, one needs to take into consideration the source of production. If the DC is in a country with several production centers total transport distances can still be shorter. However, if there is one production center or one area where all the imported goods arrive, such as a port, the inbound transport distances may be larger, similar to the situation described in quadrant D in fig 1. Therefore, it is important to find a balance between inbound transport distances and outbound transport distances.

Though most warehouses and DCs constructed prior to 1970s would have been classified as DDCs, the development of these has steadily declined since. The downside with DDCs is that overhead costs, as well as rent and employee costs are typically higher. Logically, the more DCs that are managed by the same company the more complex the organization becomes and the higher costs associated with coordination are. With many companies increasingly focused on cutting costs there was an increase in focus on developing CDCs (Chandra & Jain, 2007.

McKinnon, 2009. Rushton, et al. 2014). However, with the recent growth of e-commerce, there has been a renewed interest in developing more DDCs. There are two primary reasons for this. The first is related to response times. Oftentimes e-commerce customers expect short deliver times which means that e-commerce companies have to have their DCs located near their customers (Lau, Jiang, Ip & Jiang, 2010). The second reason is in relation to transport costs. Due to the nature of e-commerce, outgoing volumes are rather small and most of the parcels can be defined as low density. Each customer typically only buys one or a small handful of products each time meaning that economies of scale can be difficult to achieve even if each geographical area has several customers. Therefore, it stands to reason that many e-commerce retailers try to minimize the distance between the DC and the customers (Bendoly, Bretthauer & Venkataramanan, 2007. Mattarocci & Pekdemir, 2017). McKinnon (2009) also argued that IT developments enable efficient management of inventory from a central location, even if the inventory is dispersed in several locations, which was previously a restriction for a decentralized distribution strategy. Nonetheless, it should still be noted that many companies in the e-commerce sector still utilize some type of decentralized distribution in combination with a more central location where products with lower turnover are typically located (Mattarocci & Pekdemir, 2017).

3.2.2 Centralized Distribution

In order to reduce demand risk, many companies rely on centralized warehouses as key distribution points or CDC. The logic is that if there is uncertain demand in a larger region, costs can be saved by pooling the resources together (Schmitt, et al. 2015). This is often also referred to as risk-pooling (Snyder & Shen, 2006). Using city A and city B again as examples, if these cities have uncertain demand, it is often considered wise to rely on a central distribution location somewhere in-between these two cities so that the inventory can be stored at a single location. If city A were to see a large surge in demand for a certain product whereas city B does not experience that same surge in demand, the inventory at the single location can more easily be pooled together and shipped to city A to meet the demand. Later, if B experiences the same surge, but at a later date, ideally the stock levels will have been replenished and the inventory can be shipped to city B. Though it may sound simple, there are a wide array of factors which can impact demand risk or demand variation depending on the product sold. Any number of events can impact demand risk. Whereas some are more predictable, such as a change in seasons, others such as natural disasters, are more difficult to predict. Any such fluctuation in

demand can impact an organization negatively if there is a lack of extra inventory, or buffer (Zsidisin & Ellram, 2003).

The compared cost is also important to mention. Due to the reliance on a single location, it is far easier to achieve costs of scale for a CDC. This means that even if total transport distances increases, as suggested by Lumsden (2006) in Figure 1, there could still be cost savings due to fact that the vehicles have a higher fill rate or due to a potential modal shift in transport. Due to the higher volumes and longer distances, transport volumes could shift from road to e.g. rail, which is more competitive when distances and volumes are high. Other sources of increased efficiency in terms of costs include lower compared rent, lower overhead costs, decreased need for supervision, and fewer employees for the same volume (Rushton, et al. 2014). Such benefits are indeed attractive and have been mirrored by an increase in demand for larger warehouses. In the UK, for instance, the amount of floor space grew an average of 2.5% between the years of 1998 and 2004 (McKinnon, 2009). Similar trends have also been witnessed in the US particularly since the late 1990s. As warehousing needs shifted from being production oriented to consumer oriented, the need for larger centralized storage locations increased (Cidell, 2010).

An additional factor that could help explain this trend is the fact that it is becoming increasingly common for smaller and midsize companies to outsource their warehousing needs to a third party logistics provider (3PL). It has been estimated that approximately 65% of the European DCs (EDC) are handled by a 3PL (De Koster & Warffemius, 2005). The impact this has is that these 3PLs typically have several customers and are thus more likely to use a single large facility to service all of them (Higginson & Bookbinder, 2005). Overall, it should be mentioned that CDCs are more common in mature markets as it is easier to determine the costs of inbound and outbound freight volumes and achieve costs of scale in transport as mentioned by Matarocci and Pekdemir (2017). While the use of CDCs present companies with a multitude of benefits, there are still certain drawbacks with this approach. Though land constraints are frequently among the top factors, an additional factor is the increased traffic volumes on a single, or very few routes as mentioned by Hesse & Rodrigue (2004).

3.2.3 Expanding the Literature Base

However, in most instances these two categories of DCs are insufficient to describe what companies rely on. While smaller companies may only rely on a single DC for inventory, this is rarely the case for larger companies and while many larger companies rely on several DCs, the number that are utilized vary greatly depending on the type of products, size of company and the distances between suppliers and end customers. As argued by Snyder & Shen (2006),

most companies experience both demand and supply uncertainty to a certain extent, and thus are likely to use some type of mix between CDC and DDCs. The relationship between number of warehouses and costs is perhaps best described by McKinnon in the image below:
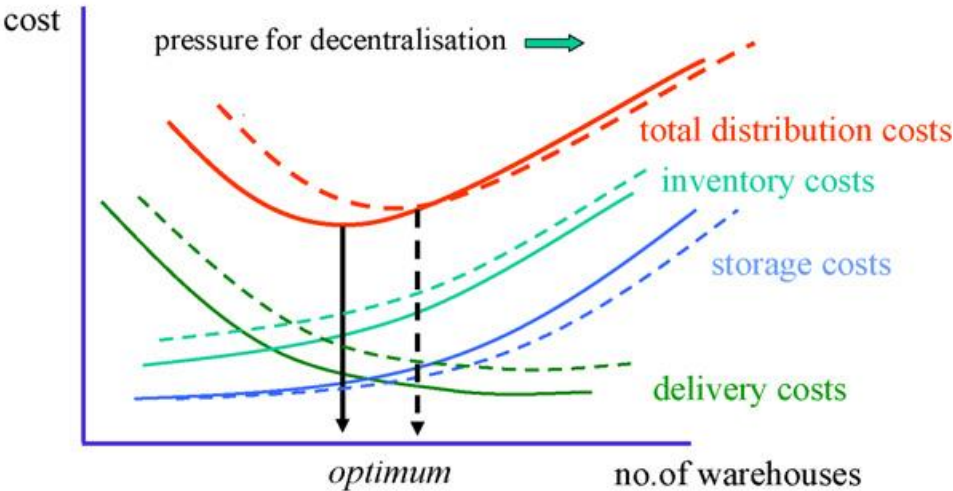
Figure 2. Number of Warehouses and Costs. Source: McKinnon, 2009, pg. 297.

As visible in the figure above, there is a relationship between cost and the number of warehouses. For most companies, the reliance on a single DC can bring about substantial costs due to the higher associated distances. Using the figure above, this would correspond to higher delivery costs as the distances between the customers or stores and the DC are larger, as shown previously in Figure 1 (Lumsden, 2006). However, in the other extreme, having an excessive amount of small DCs scattered throughout an area also has substantial costs as depicted in Figure 2. This is due to the fact that inventory costs in the large number of DCs would increase due to the higher overhead costs and number of employees required. If inventory costs were to increase substantially, this would cause the corresponding curve to rise, which would decrease the optimum number of warehouses. In contrast, if delivery costs were to increase instead, the optimum number of warehouses would increase. As McKinnon stated: "The centralisation of inventory, which has been a dominant logistics trend over the past 40 years, may be reversed by steep increases in the cost of freight transport and reductions in its speed and reliability." (2009. Pg 297). This reasoning is closely linked to Lumsden's argument about transport distances (2006).

Once again, the need to separate between different types of centralized and decentralized DCs is emphasized. In an order to produce a more accurate description, Rushton, et al. (2014) emphasized several other categories of DCs. These were defined as central (CDC), national (NDC), regional (RDC) or local DCs in ascending order in terms of number of warehouses per area. This approach was also previously adopted by Notteboom & Rodrigue (2010) using the US and Europe as examples with the following images:
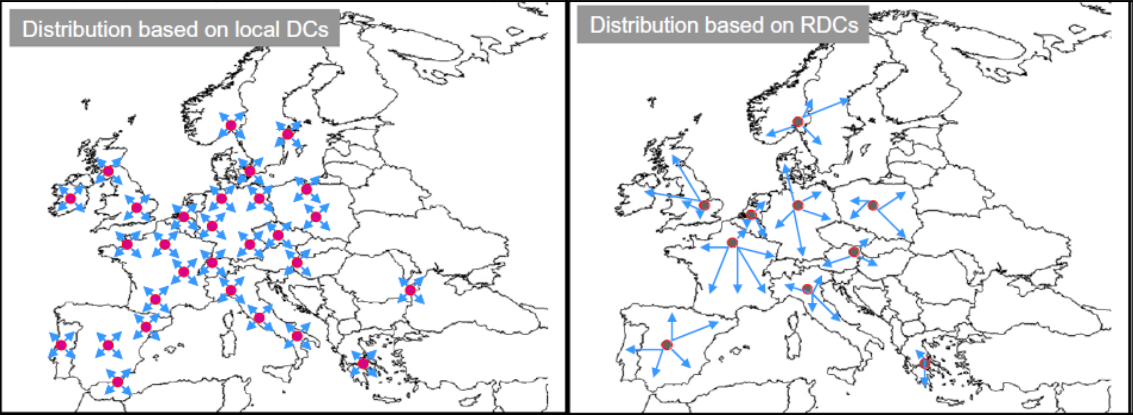
Figure 3. Local DCs and RDCs in Europe. Source: Notteboom & Rodrigue, 2010. Pg. 504.
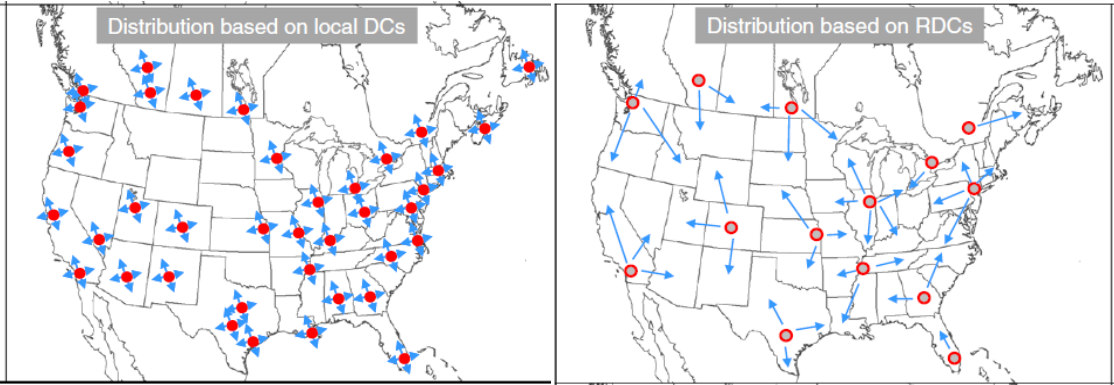
Figure 4. Local DCs and RDC in USA. Source: Notteboom & Rodrigue, 2010 pg. 505.

As visible above, both local DCs and RDC have several DCs within the same market, however, the number of DCs vary substantially. While this approach adds a degree of complexity to the discussion, the general principles introduced previously still apply. The larger and fewer DCs there are, the more cost efficient and the more beneficial it is from a demand risk standpoint. On the other hand, the more DCs there are the lower the supply risk is (Snyder & Shen, 2006. Notteboom & Rodrigue, 2010. Rushton, et al. 2014. Schmitt, et al. 2015). As shown in Figure 1, there is a need to find an optimal number of warehouses to fit the needs of each company (McKinnon, 2009).

4. Factors Impacting Location Selection & Number of DCs

In this chapter, a general framework detailing factors that impact warehouse location selection will be examined and applied in a European and Indian context.

4.1 Lumsden's Framework

While most scholars agree that establishing a DC somewhere in between the customers and the supplier base is generally the most cost efficient there are a wide array of factors that affect the suitability of a location. As previously emphasized, one needs to analyze how the local conditions impact the supply and demand risk. However, which local conditions that should be considered must be determined in advance in order to stay true to the scope of the study. In his work, Lumsden (2006) analyzed several factors that impacts location selection. These are summarized in the image below:

Figure 5. Framework of Factors Impacting Warehouses and DC Location. Translated from Lumsden (2006) pg 613.

Though this framework may appear complicated and daunting at first sight, many of these factors are heavily correlated. For instance, room for expansion, proximity to markets/competitors, ability to provide service, and proximity to industrial hub or industrial hub or major city, are all factors which are strongly correlated. A DC cannot for instance, be located too far from either the end market where the customers are, or too far away from the production base. Being located far from both or either would increase transportation costs and diminish the DC's ability to adequately provide the service it is meant to provide. Naturally, all these factors directly impact and are impacted by the land a company can acquire to build a DC on. As such, Land Acquisition serves as an excellent title for a category which can encompass these factors.

The ability to secure loans and ability to secure grants are both related to securing financing, which is a topic directly related to the ownership structure of a given DC. How a company decides to proceed with ownership of a particular plot of land or DC impacts how it can negotiate terms with the local government. A company may seek to lease their DC from the government rather than construct one on their own and therefore the availability of buildings that the local government has at hand and the personal contacts the company has are factors that impact the negotiating terms. This topic has also been explored by several authors such as De Koster & Warffemius (2005) who have studied the impact that ownership structures have on productivity and costs in warehouses and DCs.

A DC must also be located somewhere near infrastructure as without any supporting infrastructure, the DC can hardly provide the intended service as, once again, transportation costs would increase at an unsustainable rate. Infrastructure Accessibility already is a category that encompasses several factors, such as rail & rail terminals and highways. These have been studied in depth by several authors including, Cidell (2010) and Rodrgiue, Comtois & Slack (2006). Therefore, this category shall be included but will remain under a separate heading. Tradition is primarily relevant when referring to IKEA's European operations. One major reason why many of IKEA's activities are conducted in Älmhult is due to the fact that IKEA was founded there. When referring to IKEA's Indian operations, this factor is a moot point since IKEA has only recently entered the Indian market. Hence, this is not a topic that will be pursued in this thesis.

4.2 Issues of Land Acquisition

Though the choice of strategy relies extensively on advanced cost predictions and extensive calculations there are naturally, additional factors that impact the choice of strategy. In the

model introduced by Lumsden (2006), he stresses the importance of availability of buildings, room for expansion, ability to provide service and proximity to industrial hub or city. These factors are directly related to land acquisition. The availability of land thereby also directly impacts the strategy chosen. Depending on the local circumstances, there may be limitations to each strategy. While a large CDC will require a lot of consecutive land parcels, smaller DDCs will require several small parcels of land.

Contrary to what may be the most optimal location in terms of distances and other beneficial circumstances, many times the plot of land a company seeks may simply be unattainable. As Adams, Russell & Taylor-Russell (1993) argued, one of the unique characteristics of land as a resource is that one cannot relocate it to wherever there is demand. As succinctly put by Mark Twain: "Buy land, they are not making it anymore," (McIntyre, 2009). While this constraint may sound obvious, it adds several restrictions to how companies can operate in any given area. Since most companies seek areas with similar attributes, such as accessibility to roads, there is likely to be stiff competition for land acquisition (Hesse, 2004. Notteboom & Rodrigue, 2010). Any area with several competitors seeking land for development purposes will likely experience a surge in pricing. The type of DC that a company wants to develop has a direct impact on the amount of land required and in turn, the chances of acquiring such land. Whereas a local or regional DC can have a floor space ranging from anything in between 50,000 and 100,000 m2 many national DCs are likely to go well beyond those sizes (Hesse, 2004). Though such demands may not be an issue in countries where there is plenty of land available or where each parcel of land is rather large, this is certainly an issue in areas where land ownership is more fragmented.

In Europe, challenges related to land acquisition vary significantly between the different countries. In a report written by Shalak & Turk (2006), the regional differences for logistics development were analyzed and the following image was produced:

Figure 6 Land Prices in Europe. Source: Shalak & Turk, 2006. Pg. 46.

While some of the numbers presented above may be outdated, what is important to note is the relationship of land costs and country. As shown above in Figure 6, land costs appear to be lowest in France, Western Germany and Eastern Europe, while Italy, Spain, Central & Eastern Germany and the East coast of Sweden appear to have the highest land costs. Of course, the price of land is only one of the factors that impacts land acquisition and warehouse development. For instance, though land prices in Britain is one of the highest in Europe, Britain along with Germany and France account for approximately 65% of the total industrial/logistics investments in Europe with the Nordic countries like Sweden accounting for a sizeable part of the remaining investments (Mattarocci & Pekdemir, 2017). One must also bear in mind public concerns and unemployment rates. Countries or regions with comparatively high employment rates and with a population resistant to warehouse or DC construction are less likely to be accommodating towards companies attempting to expand their warehouse activities and can impact the price of land and a company's attempt to acquire it (Shalak & Turk, 2006). While there are a significant number of companies in Europe that specialize in purchasing parcels of land in strategic areas and aggregating them into a single plot of land, the local governments still play an important role due to the fact that they control which areas can be designated under the appropriate zones (Raimbault, Andriankaja, & Paffoni, 2012. Mattarocci & Pekdemir,

2017). Therefore, another challenge is once again, related to the ever evolving government priorities.

Land acquisition has been noted to be a particularly prevalent issue in India, especially for foreign companies. Here, one of the main factors that complicates land acquisition is the highly fragmented land ownership. Unlike many European countries, the plots of land in India are rather small. This means that any construction which requires large plots of land cannot occur until land is purchased from a large number of land owners. Consequentially, the more landowners that are involved, the smaller the chance is to secure the land purchase, especially at a reasonable cost (Raghuram & Mehta, 2011. Levien, 2012). In addition, the higher the number of landowners involved in a land acquisition, the higher bargaining power they possess. Even if only a fraction of the affected land owners increase demands, entire infrastructure projects can be shut down or stalled for several years (Thomas, Kalidindi & Ananthanarayanan 2003. Levien, 2012). Furthermore, since the majority of land that is suitable for industrial development is agricultural land, special government permits are also required before the land can be converted into industrial land that can be constructed on (Haralambide & Gujar, 2011). In many instances, land has to be first acquired by the government before the foreign company is allowed to develop it for their purposes. However, in recent years, there have been so called land wars between land owners, (primarily farmers) and local governments attempting to acquire their lands which have resulted in prolonged legal disputes (Narain, 2009. Levien, 2012).

4.3 Ownership Type

There are several different options available for DC development. The most common of these are; Public warehouses, Government warehouses, Private warehouses, Bonded warehouses, and Co-operative warehouses (PWC, 2011). Many of these categories have overlapping features. For instance, both Public and Government warehouses are warehouses that are owned by the government and can be leased by private operators. The main difference between the two appears to be related to size and number of private operators that use them at the same time. This distinction however, is not shared by everybody. Some scholars simply use the term Public warehouse as a broader term that encompasses both and many scholars only use two terms, Public or Private to describe the type of ownership for warehouses and other logistics terminals (Bask, Roso, Andersson, & Hämäläinen, 2014. Kay, 2015). For the sake of simplicity and based on the available literature, this thesis will rely on the two broader definitions of warehouse ownership which will be studied in depth in the upcoming section.

4.3.1 Public Warehouses

Public warehouses or DCs are "Warehouses, licensed by the government to private entities, individual or cooperative societies to store goods of the general public" (PWC, 2011, pg. 6).

One downside relates to location selection. Oftentimes, the private company has limited power in deciding where the DC or warehouse is to be located as it is already constructed by the government. Though a government may have several warehouses in several locations, this may not always be the case. Furthermore, depending on the type of warehouse, the company in question may have limited options in terms of renovating the warehouse to fit their needs. This is also due to the fact that public warehouses often have several tenants who may have different needs due to the wide range of products which can result in certain inefficiencies (Taniguchi, Noritake, Yamada & Izumitani. 1999. De Koster & Warffemius, 2005). However, the advantage of using public warehouses is that a company can more freely switch to another location if the company's needs were to change (Hesse, 2004). It is often also possible to negotiate low interest funding which can lead to extensive negotiating with the local government with regard to hiring practices (Taniguchi et al. 1999).

In Europe, public engagement in warehouse development varies significantly. One reason why the UK and Germany are still competitive even though land costs are higher is due to the higher levels of automation which decreases labor costs (Shalak & Turk, 2006). Other factors, such as legislation regarding operation hours or regarding building permits also impact the decision making. Lately however, there has been a decrease in public support for warehouse development. This is mainly due to the increasing awareness of pollution and due to rising rates of automation in warehouses. Automation typically has a negative impact on public support due to the fact that it is often associated with lower employment levels. This is because a new warehouse or DC that is highly automated is less likely to employ as many semi-skilled or unskilled workers. An additional factor that will undoubtedly impact the willingness of a local government to construct a warehouse or DC is the rapid depreciation of many DCs. New equipment and a rising demand for larger DCs to reduce overhead costs have rendered many smaller warehouses built in the mid-1900s obsolete (Mattarocci & Pekdemir, 2017).

In India, there are a wide array of public warehouses. Though most of these are dedicated to the agricultural business, they can still be an attractive option due to their widespread availability and excess land connected to the warehouses (Jain & Raghuram, 2013). Furthermore, if certain criteria are met, the company can secure government subsidies which could help dramatically

reduce operating costs. These subsidies can be related to leasing costs, operation costs, or even fuel costs depending on the negotiated contract (Haralambides & Gujar, 2011).

Following a string of policy reforms made to encourage an increase in participation from private companies in infrastructure projects, India has seen a surge in expansion in the logistics sector, including in warehousing and distribution (PWC, 2011). The primary method of involving the private sector is by establishing Private-Public Partnerships (PPPs). Normally this means that the company will lease public warehouses in exchange for certain fees and other conditions agreed upon in the concession agreement. The majority of warehouses in India are publicly owned (Haralambides & Gujar, 2011). Many public warehouses are, however, outdated and have reportedly lacked sufficient power supply, IT infrastructure, temperature control and measurements to accommodate more rapid offloading of goods. Most public warehouses have also been criticized for their insufficient size and capacity (Chandra & Jain, 2007. PWC, 2011. Jain & Raghuram, 2013). The small size of the warehouses are important to mention as oftentimes they have smaller internal measurements which impacts the type of forklifts that can be used for offloading as well as the speed of offloading, depending on the height of the loading bay. These restrictions are particularly important to note as it has been estimated that roughly 80% of the warehouses in India are primarily manually operated (Jain & Raghuram, 2013).

Since there is a great degree of negotiation involved in order to utilize public warehouses, there is significant variability in attractiveness between different areas or regions simply based on how cooperative the local government is in those areas. This is particularly important to note when analyzing India as there are numerous states and, due to its large population, there is also substantial variety between the different local governments. Aspects such as risk assumption or losses due to delays in for instance, land acquisition can be major sticking points in negotiations between local governments and private companies (Thomas, et al. 2003).

4.3.2 Private Warehouses

A private warehouse is a warehouse which is oftentimes owned by the same company that stores the goods in that warehouse (Malz, 1994). This type of warehouse or DC allows the company to more freely modify the space in terms of location, size and organization to best suit its needs. However, one of the primary downsides with this ownership structure relates once again to land acquisition. Private companies rarely have land available and therefore have to purchase it. There are additional complications. Since the warehouse is private, it can be more difficult to negotiate with the government to get various permits. In general, the process of establishing a

private warehouse or DC can prove very time consuming depending on which local government the company in question is negotiating with (Jain & Raghuram, 2013).

Establishing private warehouses has been noted to be particularly challenging in India, especially for foreign companies. One of the main issues is, once again, related to land acquisition. Currently, many of the privately owned warehouses in India are very small compared to their European or US counterparts (Chandra & Jain, 2007. Jain & Raghuram, 2013). Part of the reason why, is that, as previously mentioned, private companies are typically not able to purchase land for the same price as the government. While the government already has a vast amount of land available at its disposal and can secure additional large swaths of land for development as Special Development Zones, private companies have to purchase land at market values (Haralambines & Gujar, 2011. Jain & Raghuram, 2013). In the past, many private companies ran the risk of double taxation depending on the states they were active in. If a company was operating in several states, they often resorted to locating a warehouse or DC in every state they operated in even if this was illogical from an efficiency standpoint (Mulky, 2013). This issue has since been addressed and countered with the introduction of the standardized Goods and Service Tax (GST) in 2016 (Mitra, 2006. PWC, 2011. Sunitha & Chandra, 2017). Even with the introduction of the GST, it should still be noted that certain structural limitations will likely remain for some time as documentation requirements need to be updated and employees need to undergo training for the new taxation system.

4.3.3   Third Party Logistics Providers (3PLs)

In other developments, many warehouses or DCs are built and owned by other companies than those that are using it. This has become a growing trend in the US in particular. One of the key reasons behind this primarily relates to the fact that this method can offer companies greater freedom in choice of location. Indeed, since the company leasing or renting the warehouse does not actually own it, the company can choose to relocate to a different area at substantially lower costs than if they owned it (Hesse, 2004. De Koster & Warffemius, 2005). This method is, in contrast, not as common in Europe where it is more common that the companies own the warehouses themselves. However, the region has also seen a similar growth in interest. One driving force behind this change can be related to the fact that many governments in Europe have become increasingly hesitant to devote large swaths of land for industrial or logistics development (Raimbault, et al. 2012).

Many times, these warehouses are operated by a Third Party Logistics provider (3PL). These are private companies that offer their logistics services to other companies. A growing number

of private warehouse operators are 3PLs. This means that they have several smaller or midsize companies that they serve in one DC (Higginson & Bookbinder, 2005). Since a 3PL typically serves several companies, its ability to customize the warehouse to accommodate a particular type of goods flow is limited. In fact, it may not be in the interest of the 3PL to change the warehouse too much as these changes can quickly become redundant if the customer decides to leave. The lack of customization ultimately creates some inefficiencies for companies with very large volumes (De Koster & Warffemius, 2005). Due to the wide array of restrictions regarding private ownership, 3PLs do not have a strong presence in India. It is estimated that only 10 % of the Indian market is served by 3PLs compared to 57% in the US and 40 % for Europe (Mitra, 2006).

4.4 Available Infrastructure

As has previously been established, the access to and the availability of supporting infrastructure also plays a crucial role in distribution network development. The availability of supporting infrastructure impacts the choice of transportation mode, transportation time, and reliability of transport. This is a factor that differs significantly from country to country, as well as between regions. Though there is a wide array of topics that could be placed under the category supporting infrastructure, the main points of focus will be on port connectivity, rail connectivity and road connectivity as these were the factors highlighted by Hesse (2004), Cidell (2010) and Notteboom & Rodrigue (2012) and are the most relevant factors to analyze as the products sold by the case company, IKEA, are typically heavy and sold in great numbers. As such, other factors such as airport infrastructure are not included.

4.4.1 Maritime Connectivity

For many countries, ports serve as the primary access point for products traveling great distances. Therefore, traditionally, any company reliant on imported goods was also reliant on good connectivity to major ports. In recent years, there has been a recent surge in hinterland development in many nations. The term dry port refers to the development of inland terminals, that function as an extension of the port. Much like at an actual port, services such as customs clearance, container depot, and coordination with 3PLs are conducted from the dry port (Rodrigue & Notteboom, 2012). Some dry ports even function as DCs, whereas others simply serve as a node or pit stop, before the goods continue on to the next leg of the journey to the DC itself. Regardless, the development of inland terminals means that DCs do not always have to rely on direct connectivity to the port but can instead rely on good connectivity to its inland

terminal. Realizing these benefits, an increasing number of DCs have therefore been constructed near dry ports (Ng & Cetin, 2012).

Though there are substantial trade volumes between countries within Europe, ports play a crucial role in facilitating economic growth. While Europe imports vast amounts of products from countries in Asia and North America, there are also substantial exports. However, with the rise in global trade and imported products to Europe, many ports have struggled to keep up with the developments. Acquiring new land for port expansion is a costly endeavor and with the growth in ship sizes, the number of stops in Europe have decreased as container flows are concentrated in increasingly few locations. As a result, competition has increased substantially (Notteboom & Rodrigue, 2005). In order to improve port productivity, there has been a rapid growth in hinterland development throughout Europe with Germany, France, Spain, Italy and Poland as examples (Notteboom & Rodrigue, 2010). More recently, public concern regarding the negative environmental impact of ports has also increased resulting in increased resistance to port expansion (Puig, Wooldridge & Darbra, 2014. Lam & Notteboom, 2014. World Bank, 2017). These pressures are important to note as ports that do not have support from the public will likely face resistance from the local government as well, which can negatively impact port operations and productivity.

In India, the largest port, Jawaharlal Nehru Port, or Nhava Sheva International Container Terminal (NSICT) as it is often called, is located outside Mumbai and handles approximately 40% of India's container traffic (Salhotra, 2007. Ng & Cetin, 2012. Raghuram, Udayakumar, & Prajapati, 2017). During the past 10-15 years many ports, including NSICT, have expanded their operations further inland in order to improve service levels and reduce congestion at the port. These inland ports are referred to as either dry ports, or Inland Container Depots (ICDs), Since the majority of ICDs in India are publicly owned, it is unlikely that they will serve as a DC for a single company but rather, as an intermediate loading or storage point (Ng & Cetin, 2012). A prominent source of delays and extra cost, however, is India's long history of corruption and pilferage at the ports and customs clearance. Many times, certain officers will delay customs clearance of certain products in hopes of receiving additional money. In addition,due to low levels of security at many ports and terminals, the risk of losing goods due to theft, i.e. pilferage, is high (Subramanian & Arnold, 2001). Generally speaking, there are not many inland waterways in India that function as routes for freight transport. Therefore, the primary modes of transport that connect the port to a DC or a supplier to a DC are typically rail or road (McKinsey & Company, 2010), which will both be analyzed in the following sections.

4.4.2   Rail Connectivity

Though the interest in developing DCs that can utilize rail transport has previously been tepid, there has been a growing interest (McKinnon, 2009). Indeed, the growing body of literature supporting various forms of intermodal transport and the increasingly widespread adoption of the dry port concept has further encouraged many companies to develop their rail connectivity, especially those that import substantial amounts of goods (McKinnon, 2009. Hanaoka & Regmi, 2011). However, one of the limitations with relying on rail as a transport mode is the lack of flexibility. To justify the use of a train carrying cargo, not only do volumes need to be high, the distances have to also be rather substantial (Roso, Woxenius & Lumsden, 2009). Therefore, it stands to reason that it is either larger DCs or DCs that are in an area where several other DCs and other companies exist with high enough volumes that prioritize rail connectivity (Rodrigue, 2008). Furthermore, if goods are heavily concentrated on a single source of transport, such as rail, there are also limited options to substitute the goods with another mode of transport should disruptions arise. This relates to the argument brought forth by Hesse & Rodrigue (2004) in regards to over relying on a single or very few supply routes.

When referring to the use of rail in Europe, there are several factors that need to be considered. Though other markets, such as the US, which have more prominent rail usage have primarily relied on private actors to build and utilize the rail services, Europe has not had the same approach. For instance, regarding the rail operators, most are nationally owned and for a long time government owned rail operators were mostly resistant to allow other operators to utilize the same tracks. Though the government monopoly of the European railroads gradually changed, the process was slow. Multiple legal hurdles had to be addressed and involving the private sector would prove to be a time consuming process (Woxenius, 1994. Lewis, Semeijn, & Vellenga, 2001. Beria, Quinet, Rus & Schulz, 2012). Different standards related to locomotives and signaling systems have also had a negative impact on the competiveness of rail. Most importantly however, many countries in Europe have had different gauge sizes (Lewis et al, 2001. Zunder, Islam, Mortimer & Aditjandra 2013). This meant that if goods were being transported between two countries with different gauge sizes, the goods would need to be offloaded and loaded onto a different train. Not only does this create substantial costs, it also drastically increases the amount of time it takes for the goods to be transported. The issue of costs needs to be addressed in particular. The high costs have led many rail operators to limit the frequency and number of connections to only the most profitable areas. This has, in turn, caused many companies to shy away from rail usage (Kreutzberger & Konings, 2016).

Though there has been a growth in interest to establish good rail connections for supporting infrastructure elsewhere in the world, the rail infrastructure in India remains lacking. While private actors in Europe have become increasingly active in the rail market, the rail market in India is still government run (Cidell, 2010. Kurosaki & Singh, 2016). The result is that it is typically more expensive than its private counterparts would be. It is estimated that between 70 and 75% of the total transportation cost has to be paid to the state run Indian Railways as a haulage cost, and though there has been an increase in volumes transported by rail, there is a lack in appropriate terminals or dry ports (EY, 2013. Kurosaki & Singh, 2016). Since goods normally have to be transferred from the trains to trucks for the last leg of the journey, having good terminals is paramount for rail competitiveness. Slow transferal times or delays due to other forms of processing greatly impacts the costs for companies. Growing traffic volumes in certain areas has further strained the capabilities of the rail network resulting in a rise in congestion. This has caused reduced speeds on the tracks and thus delays have become all the more frequent, particularly on routes such as the Mumbai-Delhi rail link (Haralambides & Gujar, 2011. Deloitte, 2014). In other regions, one of the main factors impacting rail competitiveness is the low frequency of rail services prevalent in several ports. As a result, road has remained a more popular alternative even over long distances (Cook, Das, Aeppli, & Martland 1999. Ghosh, et al. 2011. EY, 2013).

4.4.3   Road Connectivity

As mentioned previously, one of the primary considerations impacting the decision making for DC location is the access to major roads. Regardless of which other transport modes are used in other legs of the journey, the vast majority of goods are still reliant on a truck for the final leg. Therefore good connections to the road network are paramount for DC locations both from the port and to the final destination (McKinnon, 2009. Cidell, 2010. Notteboom & Rodrigue, 2012). This has caused most major warehouses to relocate outside the city center in order to avoid congestion.

In Europe and particularly within the EU, zone road transport has become increasingly prominent. Due to the limitations with rail transport and the slow adaption of restricting legislation, companies in Europe have increasingly relied on road transport. With the introduction of cabotage and other pieces of legislation, road transport has experienced a period of substantial deregulation. Cabotage was defined by Sternberg, Filipiak, Hofmann, & Hellström as: "national road freight transport undertaken by a foreign haulier," (2015. Pg. 15). While the introduction of cabotage addressed the shortage in truck drivers, there are rising

concerns that in the near future there will be a shortage of drivers once again. As the current workforce retires and as trade volumes continue to increase, the shortage of drivers will become all the more pressing. Similar shortages can also be seen in North America where, much like in Europe, there has been a growing interest in automated trucking services (Shankwitz, 2017). One automated trucking solution which has received attention is platooning which would allow a single driver to control several vehicles with the help of sensors on the vehicles. Platooning may also reduce fuel consumption as these vehicles would have the possibility to drive in very short proximity of each other, thus reducing the air drag force (Farokhi & Johansson, 2013. Shanwitz, 2017) While these developments have the potential to circumvent the shortage of drivers, it will still take several years to implement new laws allowing their utilization in the market. In the meantime, it is likely that transport costs will rise as competition for available drivers increases.

India has one of the largest road networks in the world, with 3.3 million kilometers of road in 2007 and 4.7 million kilometers in 2011 (Singh, Sandhu, Singh, & Joneson. 2007. Ministry of Road Transport and Highways Transport Research Wing, 2012). Between the early 60s and late 90s, as the Indian economy grew the share of freight that was transported via road rose from 11% to 60% (Cook, et al. 1999). Unfortunately, much of the existing road network is currently either in disrepair, causing traffic delays due to forced lower speeds, or are insufficient in width, once again causing lower speeds and traffic delays (Singh, et al. 2007). Much of the road network is also facing issues of congestion, not only due to the disrepair of many stretches but also due to the growth in vehicle ownership which has for several years outpaced road construction. These combined effects have resulted in higher costs for road usage compared to many other parts of the world. In fact, there are estimates that road haulage is 30% more expensive in India than in the US (Deloitte, 2014). However, the higher flexibility and lower transit times between the different modes means that many continue to rely on road as a primary mode of transport even if it is inefficient at its current state (McKinsey & Company, 2010. EY, 2013). Therefore, choosing an appropriate location for a DC becomes even more important.

The most viable option is to locate a DC near a national highway. Not only are these highways of higher quality, they also serve as major traffic arteries to the largest cities in India such as Mumbai, Bangalore, Delhi or Calcutta which is typically where the company's target markets are located. Though these highways only accounted for 1.4% of India's total road network, they account for more than 40% of freight transport by road (Mitra, 2006. Mitra, 2008). Granted, due to the high traffic volumes there will likely be a substantial amount of congestion on those

roads, however, due to the poor state of many other roads and the high levels of congestion overall, most companies have few other options. In a research report targeted towards potential investors, Knight Frank Industries produced a report about the suitability of each region in India for major warehousing or DC development. Here, they highlighted several areas that are not only large metropolitan areas but also have good connectivity to highways that connect these cities. The major highways in India can be seen in the image below:

Figure 7. Road Network in India. Source: Jonas Lang LaSelle Meghraj, 2016. Pg. 14.

When analyzing the competitiveness of road transport services, one must also consider the transport service providers. There are a wide array of private operators in India that offer their services at a low cost. However, there are substantial challenges that need to be addressed. Not only is the industry highly fragmented and unorganized, many of the service providers have very small fleets with smaller vehicles. Chandra & Jain (2007) further argued that:

"The transportation industry … comprises owners [sic] and employees with inadequate skills, perspectives or abilities to organize or manage their operations effectively. Low cost has been traditionally achieved by employing low level of technology, low wages (due to

lower education levels), poor maintenance of equipment, overloading of the truck beyond capacity, and price competition amongst a large number of service providers in the industry." (pg: 4).

Collectively, these issues result in decreased performance and reliability. Moreover, since most of the transportation companies have very small fleets, this also means that companies that need high volumes of goods to be transported may have to rely on several transport companies. This increases the level of complexity of the logistics operations.

5. Findings

In this chapter, the findings from the interviews and field trip will be presented. The first half of the chapter will focus on the European market and the second half will focus on the Indian market.

5.1 IKEA's European Distribution Network

Since Europe is IKEA's largest market with 275 stores, there will naturally be several DCs to supply them. There are also different ways to calculate the number of warehouses as several locations have more than one building that serves as a DC. If one considers the locations that have several buildings as a single DC, IKEA has 16 DCs serving the European market, with Germany, Italy, and Poland containing the largest DCs and additional smaller ones located in Britain, Sweden, France, Spain, Russia, the Netherlands and Belgium as visible in the image below:
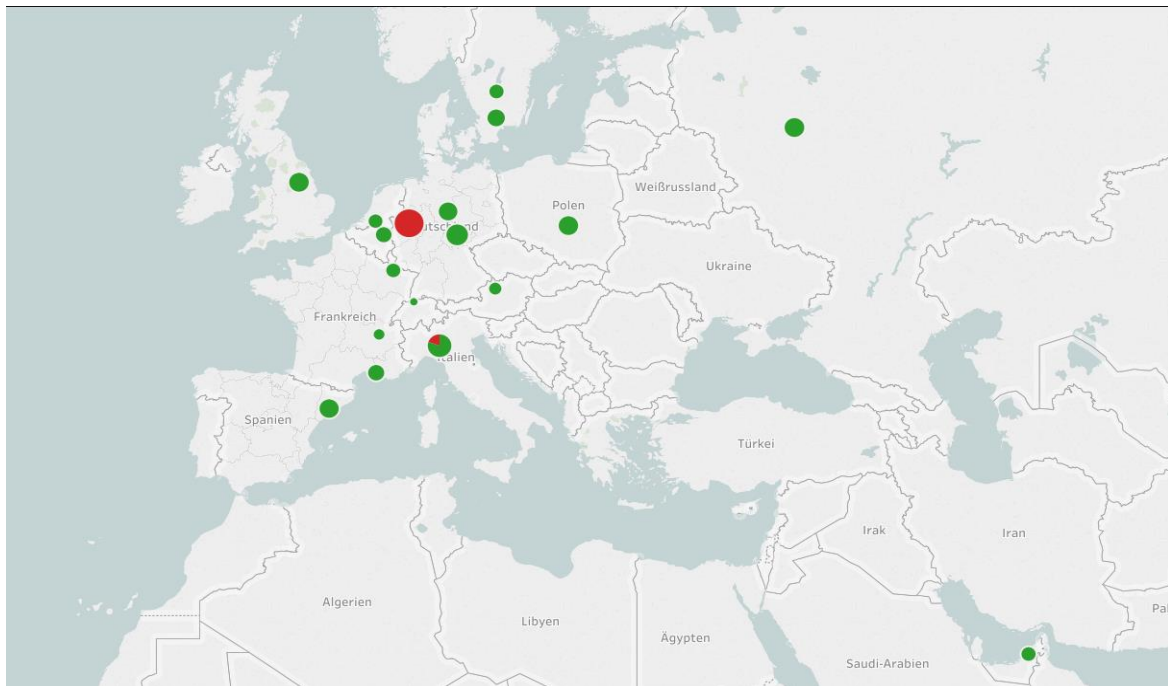
 11 subregions = 11 High flow DCG, in 13 countries

 2 Low flow DCG, in 2 countries

Figure 8. IKEAs European DCs. Source: Interviewee 3

Note: DCG = Distribution Center Group.

High Flow = Larger products or package of several products (typically large enough to fill a pallet).

Low Flow = Smaller individual products that involve more handling.

As seen in the image above, there are two DCs with low flow products, one in Germany and one in Italy, that serve the entire European market. The other 15 are for products that are larger or that are delivered in bulk, such as pillows which are typically delivered in a larger box. One can see that the concentration of the DCs roughly corresponds to the market sizes within Europe. For instance, Germany, being the largest European market also has the highest number of DCs which are also rather large. Smaller markets, such as Switzerland, is served by a single small DC whereas Sweden is primarily served by two mid-sized DCs. A large DC is typically defined as being approximately 200,000 m2 whereas a midsize is between 100,000 and 150,000. The DC in Dortmund which is marked with a large red circle in the map above is the largest at 300,000 m2. One reason for the high number of DCs, according to Interviewee 2, also

relates to the comparatively large products. This would also explain the imbalance between low flow and high flow DCs as low flow products are per definition significantly smaller and require less space. This was also noted as a factor that set IKEA apart from other companies and their distribution networks as most other companies sell smaller products that require less space. Several of the DCs are also located fairly close to where the suppliers are located, with Poland, Sweden, France and Russia serving as excellent examples (Interviewee 3). Interviewee 2 was careful to note a development that is not visible in the image above, and that is the introduction of customer DCs. These function as smaller DCs where customers can go to collect items that have already been ordered and picked in advance. These DCs are typically smaller but hold a wide variety of products. Depending on the popularity of this concept this can also impact the distribution system.

5.2 Issues of Land Acquisition & Ownership Type

In Europe, IKEA typically owns the land that it builds on. Not only does ownership provide the company with an increased sense of security, as there is no other landlord that can dictate new terms, it is also considered an investment. Land typically increases in value and can thus be considered an asset for the company.

Challenges related to negotiations with the local government have become increasingly prominent. Many local governments have become less supportive towards companies trying to build large warehouses or DCs on their lands. DCs typically have high traffic volumes which contribute significantly towards noise pollution and increase traffic risks in the area. Though previously these negative impacts were contrasted to the number of people that the DCs could employ, increased automation has meant that employment numbers have dropped.

In addition, there are few plots of land that fit all the requirements IKEA has. Bearing in mind the size and infrastructure requirements, any land parcels that fit the requirements can be located far apart. However, the increased competition from several other retailers is perhaps the most challenging factor. Both Interviewee 2 and 3 noted that e-commerce retailers such as Amazon are rapidly expanding their distribution network and oftentimes these companies have requirements that closely match those of IKEA, meaning that the competition for suitable land parcels is increasing.

Ownership type

Though IKEA typically prefers to own the buildings and the land, there has in recent years been a shift in practice. In order to secure markets early on, IKEA has started to utilize the services

of other logistics providers while IKEA constructs its facilities, a process that can take up to six years. This strategy enables IKEA to offer its products while its facilities are still being constructed.

An additional development is that an increasing number of warehouses or DCs, while still being owned by IKEA, are operated by a 3PL. This means that IKEA will own the land and construct the building according to its own specifications but a 3PL will be in charge of the logistical operations and employees within the building. This is typically done if there is a 3PL which is more efficient than IKEA and can help reduce costs. Other times, IKEA simply hires the 3PL so that IKEA can improve its own operations based on how the 3PL operates (Interviewee 3).

5.3 Available Infrastructure

5.3.1 Maritime Connectivity

There are several ports which support IKEAs distribution network. Though it stands to reason that Hamburg is the port that handles the most in terms of volume as it is the closest sizable port to IKEA's largest DC which is located in Dortmund, there are several other ports which support other DCs. While both Interviewee 2 and 3 stated that most of the goods in Europe are directly transported from the points of production to the stores, approximately 20% of the products are imported and many of these imported products are transported to the DCs. However, there are substantial exports to IKEA stores located outside Europe, further emphasizing the need for good port connectivity.

5.3.2 Rail Connectivity

According to Interviewee 2, rail connectivity is also a high priority. Though it was emphasized that the DCs hardly ever are directly linked to a rail terminal, it is rather common to be located nearby a rail terminal in order to utilize intermodal transport. This is particularly true for inbound goods. The vast majority of rail utilization by IKEA is either between the harbor and DC or from the suppliers and DC. The reason for this is that rail is most cost beneficial to use over long distances and these longer distances are typically only found between the harbor and DC or the producers and DC. For outbound goods, that is goods going from the DC to the stores, rail is hardly utilized due to the comparably short distances and the smaller volumes that are transported to each store.

Interestingly enough, though IKEA has a long-established history of utilizing rail, the percentage of goods that use this mode of transport has actually decreased over the past 20 years. One of the reasons for this decrease is linked to the lack of profitability for shorter distances of rail. This is also a factor many rail operators have realized, meaning that there are

several stretches of railway which are no longer serviced, including stretches to smaller towns and regional DCs. Another issue that has proven particularly troublesome relates to the different gauges that are used in Europe. This is particularly true for rail connectivity between Eastern Europe and Western Europe.

5.3.3 Road Connectivity

Due to the lack of rail connectivity, good road connectivity is paramount for developing a DC. Even if rail is utilized, a truck will still be used for the last mile of the transport, meaning that for both inbound and outbound freight, flows will be by road. As such, road connectivity is crucial for IKEAs operations. This is especially important in Europe since, as previously mentioned, a substantial amount of IKEAs goods are produced within Europe. Interviewee 2 argued that due to the production locations the distances and volumes between the point of production the DC and the stores may not be long enough to justify the use of rail. There are, however, growing reservations regarding the use of road. One of the primary sources of concern relates to capacity, or the number of available drivers. Currently Europe is experiencing a severe shortage of drivers. While the deregulation of the road transport sector enabled companies to utilize cheap labor from many countries in Eastern Europe in particular, many of those currently employed in the trucking sector are expected to retire soon. This means that within the near future, the currently existing shortage of suitable drivers is likely to increase drastically.

5.4 IKEA's Distribution Network in India

As stated previously, IKEA plans to open 25 stores in India by 2025 with the first to be opened in Hyderabad later in 2018. The primary areas where IKEA plans to open most of the remaining stores clusters near or in the cities of Mumbai, Bangalore, New Delhi Chennai, and Gurgaon, as well as a few additional stores in Hyderabad (Govind, 2017. Jain, 2017. Financial Express, 2017). Though most of the distribution network in India has yet to be developed, there are ongoing negotiations and plans being evaluated. One of the prevailing plans, according to Interviewee 1 and 3, is to develop 3 larger DCs located to each larger market; Delhi, in the north, Mumbai, in the central west, and Bangalore in the south.

5.5 Issues of Land Acquisition & Ownership type

It was argued by both Interviewee 1 and 3 that land acquisition was one of the greatest challenges with operating in India. Since land ownership is highly fragmented in India, IKEA would be required to purchase land from a wide array of land owners in order to secure a plot large enough for their needs. To tackle these issues, IKEA therefore aims to collaborate closely with the local governments to help aggregate the land masses. Essentially, this is a process

where the local government purchases the land from the various owners and aggregates it into one land mass that is later sold to IKEA. While this process can prove to be a bit slower and more costly due to the associated negotiations with the government, once the process is complete, IKEA can bear the full rights of the property. This is advantageous for many reasons. Not only does it allow IKEA to develop the land as they see fit and operate undisturbed by any "landlord" as they call it, the process of having the government first purchase the land before IKEA acquires it from the government also decreases the risk of various land owners or people who previously had any claim to the land try to lay claim to it later in the future after IKEA has constructed their facilities. Similar to the operations in Europe, having full ownership of the land and structures is also a considered beneficial from an investment standpoint and IKEA typically has the same approach in every market they enter, with China being a notable exception due to the fact that private ownership of land is not legal there. It should be noted, however, that the process of negotiating with local governments to aggregate and purchase land masses can prove to be very complex. Sometimes, the state Industrial Development Authority, which is the branch of local government responsible for industrial land development, is only interested in selling a long-term lease rather than full ownership of the land. While in most areas they view the construction of a DC favorably due to the potential employment opportunities, this can remain a sticking point. It is in this regard that the differences from state to state become more apparent. In addition, once the land masses have been aggregated, the competition to acquire the parcels of land increases simply due to fact that the land parcels are now larger and more attractive. Meaning that even though IKEA may have gone through a cumbersome process of negotiating with the government to aggregate the pieces of land, another firm may simply outbid them and purchase it. Furthermore, there is no guarantee that IKEA will be allowed to own the land.

Another challenge in India was related to available workforce. While DCs are typically constructed in more regional areas due to the higher availability of land, one issue is that there is often a lack of qualified employees in rural areas. This has been argued to be a particularly prevalent challenge in India as most of the warehouses there will have rather low levels of automation. Long term employee availability is also a topic that deserves special attention. Currently, the education levels of the Indian population is increasing rapidly.

Though there are an ample number of public warehouses available, most of these would not fit the high number of specifications that the IKEA warehouses have. An example of a private warehouse located outside the Whitefield rail terminal in Bangalore can be found below:

Figure 9. Poorly Maintained Warehouse. Photo taken by Author.

As visible, not only is the warehouse older and poorly maintained, the size is also rather small. It is also worth mentioning the poor state of the tarmac outside the building and the overgrown trees by the exterior walls. Another example of a nearby warehouse can be found below:

Figure 10. Warehouse with Ground Level Loading. Photo taken by Author.

Here too, the size of the warehouse is relatively small and though it has been better maintained, one issue is that the warehouse is not raised, meaning that offloading occurs on ground level. While there are many new warehouses of higher standards being built, it is not always guaranteed that they would meet the wide array of other requirements IKEA has. The reason

why it is important to mention public warehousing is that when entering the Indian market, many companies are forced to enter a partnership with an Indian national or Indian company. This can impact the amount of flexibility the company has in making its own decisions. Interestingly enough, according to Interviewee 1, IKEA is the first 100% foreign company to enter the Indian market. As such IKEA has a greater amount of flexibility, which decreases the attractiveness of public warehouses. Combined with the limitations brought forth previously, public warehouses would likely require substantial investments for them to fit the specifications that IKEA has. Using a public warehouse would also limit the extent to which IKEA can select the location which is also a high priority for the company.

5.6 Available Infrastructure
5.6.1   Maritime Connectivity & Customs Clearance
Since IKEA will locally source approximately 30% of value of the goods that they will sell in India, there are substantial amounts that are imported from abroad. As the largest port and as one of the largest targeted market, the Nhava Sheva International Container Terminal in Mumbai serves as the primary port for imported products. As such, one of the primary supporting infrastructure that was required was good connectivity to the port (Interviewee 1).

However, there was also a particular emphasis placed on the customs clearance in the port. Much like any other port, once the products reach the port they need to go through customs clearance. This process can take anywhere from 1 or 2 days to 15 or 20 days or in the worst-case scenario, more than 30 days. This depends heavily on the type of products that are imported. Due to the protectionist policies towards the local industries in India, products, such as textiles, that can be produced locally typically take the longest to pass through customs as they have the most stringent quality control. The port thereby presents IKEA with a challenge as it serves as a primary artery of goods and hence, potentially one of the greatest source of delays. This bottleneck could cause further disruptions. In addition, many ports in India have an extensive history of corruption. It is not uncommon for port employees to demand bribes to let the courier pick up the containers. If the bribe is not paid, chances are the container will remain at the port, which increases the risk of pilferage. This is a sensitive issue with IKEA as IKEA has a long standing tradition of refusing to pay any bribes (Interviewee 1).

5.6.2   Rail Connectivity
Though IKEA typically attempts to utilize rail as much as possible in order to drive down costs and improve sustainability, this has proven to be very challenging in the Indian market. In particular, it was argued by Interviewee 1 that the general lack of reliability meant that it was

not a viable option. Not only did the lack of existing trains and personnel mean that it was very difficult book regular slots, it was also a problem to ensure that the goods would be delivered on time. The amount of time it took to transport goods by rail varied substantially which could cause substantial issues related to planning and resource availability. This is closely associated with the lack of private rail operators. Since much of the train industry in Europe is privatized there is an increase in competition for the rail companies to achieve certain service levels in order to be allowed to operate on those routes. Since the railway network in India is almost entirely operated by the state these incentives are not as prominent. As a result, the service levels are lower and delays are commonplace. It is also important to mention the issue many Indian government agencies have related to bureaucracy. Many institutions have become bogged down by excessive paperwork which negatively impacts the efficiency and may also disrupt delivery times.

An additional challenge that was considered to be the largest source of disruption and the cause of most reliability issues was related to pilferages. As Interviewee 1 argued: "One of the biggest pilferages on the logistics network is however, within the rail network" which could result in products within containers going missing or, at times, entire containers disappearing. In general, an issue with using rail is that the containers are often stationary for extended periods of time at various terminals after they are offloaded from the train. This means that there are plenty of opportunities for thieves to open the containers and steal any products within.
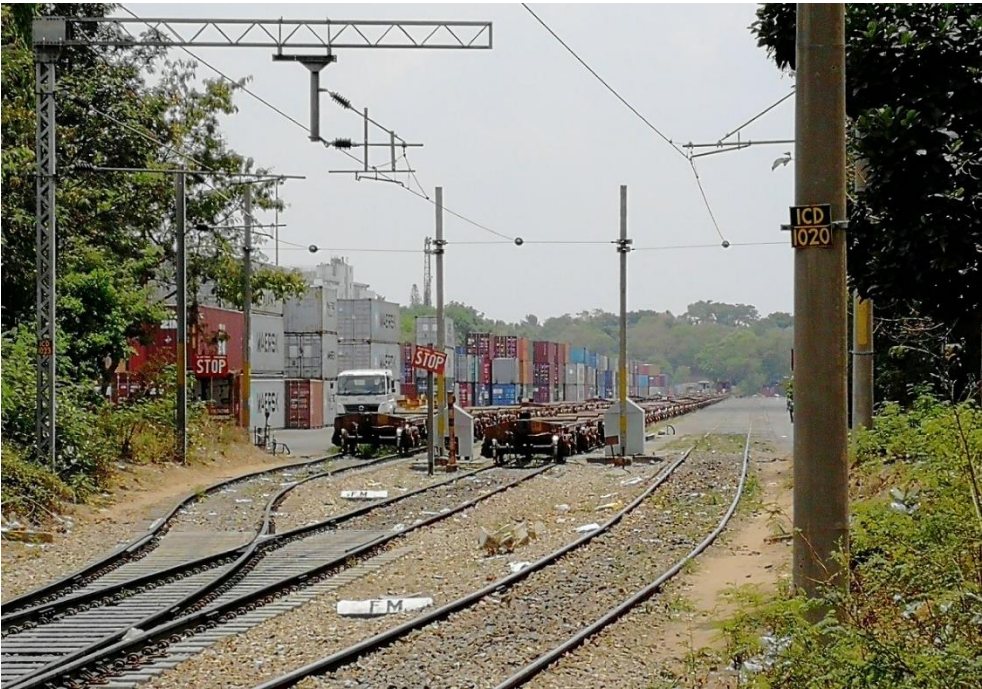

Figure 11. A Rail Terminal with a Large Unfenced Area. Photo taken by Author.

An issue many terminals in India face is the lack of proper fencing around the facility. As visible in the image above, there are often wide gaps in the surrounding fences which enable easy access for thieves who may try to steal products from the containers. Though many terminals attempt to solve this issue by having a large amount of guards, the open space in the fence still increases the risk of pilferage. There is also an issue with corruption. It is not uncommon for employees at the checkpoints or terminals to hold products until they receive a bribe. For these reasons it is not uncommon to see signs such as in the image below:
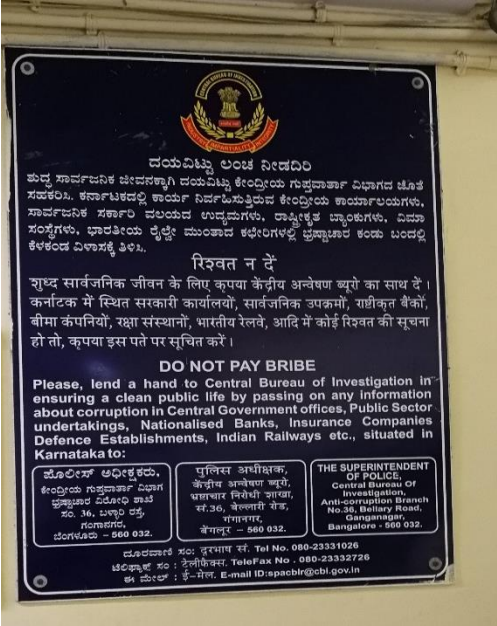

Figure 12. Sign Located at the Rail Terminal Office. Photo taken by Author.

Moreover, due to the frequent delays associated with rail, it is not uncommon for the trains to remain idle even when loaded with goods, meaning that even when the containers are on the train, pilferage remains a significant issue. This problem was less prominent with road transport simply due to the fact that if trucks are transporting goods, they are rarely stationary for similar durations of time.

5.6.3   Road Connectivity

The lack of proper safety regulations was also emphasized to negatively impact transport times. As stated by Interviewee 1, many of the roads are "used for almost every purpose, people walking, or people driving trucks and everything in between." The wide array of vehicles that use the roads naturally impacts the speed at which the vehicles can travel and also negatively impacts safety standards on the roads. It is common that a heavy truck will use the same road as pedestrians, bicycles, cars and other light vehicles. Accidents not only cause substantial costs in terms of lost goods and productivity, but oftentimes also mean that a new delivery needs to

be made as damaged goods are rejected at the warehouses and DCs. As a result, there is also a significant delay in the delivery of goods.

An additional issue raised by both Interviewee 1 and 4 was related to the wide array of different state laws. This can cause certain delays especially as the goods typically have to travel through different states and as each state may have different required documents. Furthermore, there are often strikes as well, which can halt the goods transport. This was a particular issue that was raised by Interviewee 4 who argued that while these strikes normally only last between 24 and 48 hours, they usually occur several times a year.

Due to the different state laws, most trucks are forced to stop at the border checkpoints and hand in substantial amounts of paperwork. Here, the issue of corruption also becomes apparent as it is not uncommon for delivery trucks to be stalled at the checkpoint until a bribe is paid. While Interviewee 4 argued that it is possible to circumvent this issue by transferring the goods from one vehicle to another one from within the state that the goods are to be delivered to, this is a time consuming process. This issue is especially relevant as many transport companies in India have rather small fleets of trucks and oftentimes, another company has to help in instances of delayed transport at the border checkpoint. However, there are several recent developments that have had a positive impact. Interviewee 1 mentioned that the introduction of the GST has also reduced the amount of paperwork required and other steps, such as the introduction of the E-way Bill has also dramatically reduced the amount of required paperwork. Effectively the E-way Bill functions as a summary of all the paid taxes and value of the goods all of which can easily be accessed digitally. Combined with the GST, which eliminated the local state tax differences, the opportunities for the employees at the border checkpoints to demand a bribe have decreased substantially. Furthermore, IKEA is very careful when selecting a courier or transport service provider. Before selection, careful care is taken to evaluate their business and financial performance in order to determine if the courier has a history of corruption. Irregularities in the company's financial documents is typically a strong indicator of corruption. This is an important process to undertake as a courier with a history of paying bribes at the checkpoint will likely be forced to continue paying bribes according to Interviewee 1.

It is also commonplace for transport companies to overload their vehicles in order to reduce costs. This is particularly important to note as many truck companies are small and may therefore only have a limited number of trucks at hand to meet the demands of companies such as IKEA. Therefore, it is commonplace for companies to overload their vehicles. Not only do these practices increase the damage caused to the vehicles, which in turn increases the risk of

delays due to required maintenance, it also increases the risk of traffic accidents. Many cities in India also do not allow heavy trucks to travel on their roads during the day time. Naturally, any delays which compromises the timing of transport in the cities would create further delays as the vehicles would have to wait outside city limits until they are allowed to enter or take an alternate route, which creates even further delays (Interviewee 4). Due to these weaknesses in transport, the DCs in India will need to hold more inventory than their European counterparts and thereby their turnover of stock will be lower than in Europe. In short, this means that if a European DC has a storage capacity of 100,000 m3 they should have a turnover of stock that is 500,000 m3. In India, this number may be 300,000 m3 (Interviewee 1).

Though these issues present significant challenges for companies, there are several steps IKEA has taken in order to tackle them. First and foremost, IKEA has several strict guidelines regarding the safety and quality standards of the vehicles. Secondly, security personnel perform several vehicle checks at the DCs while they are being loaded. Factors such as weight, tire pressure, safety, maintenance level, among other things are all examined closely on every vehicle that enters the facility. These factors are also considered when evaluating the performance of the couriers. However, since most couriers or transport companies in India are rather small, the number of companies that can transport the high volumes required by IKEA are rather limited. Effectively, there are only two vendors or couriers that are large enough to meet demand and who control the vast majority of the market; Ashok Leyland, and Tata. Companies that have a large market share in Europe are hardly present in India (Interviewee 1).

6. Analysis

In this chapter, the information brought forth in the literature review will be compared and contrasted to the information brought forth in the findings.

6.1 Issues of Land Acquisition and Ownership Type

In Europe, there are several challenges related to land acquisition. Though there are differences from country to country within the continent, one challenge has been particularly prevalent. Many local governments are increasingly resistant towards having large DCs in their municipalities. The growing rates of automation has in particular proved to be a sticking point for many officials as this typically translates to fewer employment opportunities for unskilled or semi-skilled workers. This is important as new employment opportunities were for a long time a key factor that many local governments sought. With that benefit now diminished, the downsides of a DC have instead become more prominent. Furthermore, due to the growth in e-

commerce, there has also been a growing demand for suitable parcels of land, in terms of location and size. The rise in competition combined with the effective decrease in supply has provided IKEA with several challenges, especially as sales continue to grow and as IKEA develops its Customer DC services which require more warehouses. Due to these challenges, IKEA has begun to utilize 3PLs to a greater extent. This represents a shift in strategy. Whereas previously the company was largely opposed to utilize other logistics service providers, they have now started to use them more, even though this is primarily done on a temporary basis while IKEA constructs their DC. Though certain countries in Europe may also have fragmented land ownership, the process of aggregating several small pieces of land into one is normally done by a separate private company which specializes in purchasing land at strategic locations, as was also indicated by Mattarocci & Pekdemir, (2017). This decreases the government involvement to a certain degree in Europe.

Contrary to many local governments in Europe, many local governments in India are interested in having a DC located within their municipality. The large available workforce and low cost of employees means that warehouse and DC development are still viewed upon favorably among many municipalities as it can reduce unemployment and produce tax revenue. However, there are issues related to feasibility. Much like Haralambides & Gujar, (2011) argued, one of the main challenges that IKEA is facing in India as well is related to land acquisition. Since the land is very fragmented and there are multiple owners involved, purchasing many pieces of land for construction purposes can prove very complicated. In order to tackle this issue, IKEA has been collaborating closely with the local governments and allows them to first buy the pieces of land from the landowners and then aggregate them into one single property which IKEA can purchase. Though such an approach decreases certain risks, it has the potential to turn into a long legal battle which can result in significant financial costs. Once the land has been aggregated it is also possible that other companies outbid IKEA for the parcel of land. Furthermore, there are also differences in whether the local governments allow IKEA to buy the land or simply buy a long term lease of the land. Such details can become major sticking points in negotiations.

6.2 Available Infrastructure

6.2.1 Maritime Connectivity & Customs Clearance

Good connectivity is very important for IKEAs European operations. Though most goods sold within Europe are produced in Europe, approximately 20% is produced outside Europe. Due to the sheer size of the European market, this translates into rather high volumes. There are also a

substantial amount of goods produced in Europe which are later exported. Good connectivity to a port is particularly important between the DCs as the DCs contain large volumes of products and serve many stores. It is also between the ports and DCs that the benefits of intermodal transport are realized due to the comparatively long distances between the two.

Naturally, good connectivity to the ports is also important in India. Since IKEA is very reliant on imported goods, the company is reliant on good connectivity to the port much like Salhotra, (2007) and Ng & Cetin, (2012) claimed. The vast majority of the goods are imported via Nhava Sheva International Shipping Container Terminal in Mumbai, meaning that any disruptions at the port or any of the interlinkages greatly impacts the rest of the distribution in India.

One of the main issues mentioned was in fact directly related to customs clearance. Depending on the products and country of origin, the goods can be held by customs clearance for anything from 2 or 3 days to well beyond 30. Though this problem will be partially addressed as IKEA produces more goods locally, the amount of goods imported will still likely remain at rather high levels. Therefore, this bottleneck will continue to disrupt the supply line and continue to cause additional costs for the company unless solved. Similarly, many ports have issues with corruption. Historically corruption at the ports in India has been rife and many companies have been refused accessibility to their containers or products until a fee is paid as mentioned by Subramanian & Arnold, (2001). IKEA addresses these issues in part by simply refusing to pay. If demands for payments persist, the local authorities are contacted and their superiors are forced to deal with the issue. Though this is a slower process which is likely to cause substantial delays, the goal is that eventually such demands will end and the goods will be allowed through without unnecessary delays. Granted, the delays in the early operations will likely cause substantial costs but in the long run, transport and delivery will be more reliable as the demands for bribes cease. Meanwhile, it should also be mentioned that while good harbor connectivity will continue to be important for IKEAs distribution network development, it would be unwise to develop the network as a port based network, at least from a long-term perspective. Especially bearing in mind the fact that IKEA intends to further develop the manufacturing base in India.

6.2.2 Rail Connectivity

As stated previously, IKEA primarily utilizes rail for long distances, typically between the harbor and DC or production and DC for their operations in Europe. However, for shorter distances, the share of rail freight has actually decreased. This is partially due to the poor reliability but mainly due to the fact that many rail operators no longer provide their services for smaller towns or shorter distances. Similarly, IKEA's own attempt to operate a rail service

notoriously failed in 2003 (Dahlquist, 2003) and other projects, such as the Southeast link, or Sydostlänken as it is called in Swedish, which was a collaborative effort by IKEA, Vovlo and the Port of Karshamn, have not been able to move beyond the planning stages and was pointedly not included in the transport authorities' project outline spanning from 2018 to 2029 (Trafikverket, 2013. Lindeborg, 2017). The European rail network has also proven to be costly to use due to the different gauges. As Zunder et al. (2013) argued, the different gauges used in Europe drastically reduces the competitiveness of rail and this has been noticeable for IKEA's European operations. Nonetheless, even though the share of rail freight has decreased, rail still plays an important role for the European distribution network.

Much like Cook, et al. (1999) and Ghosh, et al. (2011) argued, it has also proven challenging to utilize rail in India. Most of these challenges are directly related to reliability. Oftentimes, rail connections can prove to be unreliable either due to various delays, or due the lack of available trains and personnel which was argued by Ghosh, et al. (2011) to be the one of the most prominent sources of delays. The lack of appropriate terminals combined with growing freight volumes also means that congestion has increased which also creates further delays. Oftentimes, this means that the scheduling can be rather difficult as the personnel are often occupied on different routes. These shortcomings have also been echoed by several consulting firms, including Deloitte (2014), PWC (2011) and McKinsey & Company (2010). The rise in congestion is also particularly important to note because, as mentioned by Haralambides & Gujar, (2011) congestion is an issue very prominent in Mumbai and its port, where IKEA will be importing most of its goods.

Interviewee 1 stressed that one of the largest factors that impacts reliability is related to pilferage. Apparently the amount of goods that are lost to pilferage are significantly higher when rail is utilized than when road is utilized. This is partially due to the fact that containers are often left idle for extended periods of time which increased the likelihood of the products within them being stolen. In addition, due to the weaknesses in the rail infrastructure and the associated frequent delays as mentioned in the report produced by Deloitte (2014), it is not uncommon for pilferage to occur while the containers are on the train. This is an issue that requires more attention from the academic community as the number of studies beyond the works produced by Subramanian & Arnold (2001) focusing on freight transport and pilferage appears to be limited. This issue is also one that has not been as prevalent in Europe, which is another reason why the rail network in India is substantially less reliable in comparison.

6.2.3   Road Connectivity

Road has remained the dominant mode of transport in Europe. Much like Sternberg et al. (2015) argued, the loosening legislation and introduction of cabotage meant that many companies have been able to use drivers from other countries such as Poland and Bulgaria. However, concerns regarding future availability of drivers have increased as many of the current drivers will be retiring and there appears to be a limited number of drivers to replace them. Though recent developments within the road transport industry such as platooning have fostered widespread debate, there are many obstacles that need to be addressed before it can be considered a viable option. In the meantime, transport costs in Europe will likely increase as the demand for new drivers exceeds the supply.

In India, there were also several issues that impacted road reliability. Naturally, issues such as congestion, weather or road quality, which have been well researched by authors such as Singh, et al. (2007) and Mitra (2008) were mentioned as among the most prominent issues impacting transport speeds. The lack of safety was also emphasized however, as it not only meant that the general transport speeds were reduced, it also directly impacted the likelihood of an accident occurring, which could in term jeopardize the entire shipment and result in substantial costs. This is a particularly important issue to note since many of the private truck companies employ under qualified drivers, and operate poorly maintained trucks which are often overloaded as mentioned by Chandra & Jain (2007) and one of the interviewees.

Even if IKEA has strict guidelines, there are always risks that the courier will attempt to cut corners to reduce costs as was mentioned by Interviewee 4. Though performing security checks at the DCs undoubtedly decreases the risk of non-qualified vehicles being used, other issues, such as whether or not the driver is qualified will likely remain to some degree. In addition, there will likely be some variance in how carefully the vehicles are examined. External factors such as how alert the individual performing the security check is, or how much time is allocated can all negatively impact the thoroughness of the security checks. The result is that there will always be a certain risk that there will be a roadside accident due to an unqualified vehicle being used. While this may be true in Europe as well, it should be noted that most of the governments in Europe have stricter regulations regarding vehicle standards and do not allow certain vehicles to be used. One should also mention that even though there are several private couriers or transport companies in India, there are effectively only two which are large enough to meet IKEA's needs. As such, it is far from unlikely that these two couriers have vehicles which do

not match IKEA's standards and that these vehicles may be used at times when the proper vehicles are not available.

Nonetheless, road transport maintains several benefits. In contrast to rail, in the event of a transport route being compromised, there are multiple other routes available. Even if the risk of a delay increases due to the use of a different route, it is important to note that there is a higher likelihood that the goods will be in motion than if rail is utilized. As such, the risk of pilferage decreases substantially when road is utilized. Though this is associated with issues of flexibility which were discussed by Hesse & Rodrigue (2004), Roso et al. (2009) and Kreutzberger & Konings, (2016) the relationship between pilferage and goods in motion is one that is less researched.

In terms of road congestion and DC location, one must also bear in mind the challenges related to employee skillsets. Though it may be tempting to construct a DC in a rural area where there is more land available and where congestion is less prominent, the rural locations are often accommodated with lower numbers of potential employees, especially those who possess the required skillsets. This is a prominent issue in India which was also highlighted in the PWC report (2011). In addition, due to the fact that education levels and demands for more prestigious jobs are increasing rapidly, one must secure long-term employee availability. Rural areas with less population density thereby present an additional challenge in the long-run. The limitations brought forth by higher traffic levels need to be addressed in particular as most of the freight transport within India will be limited to road due to the issues brought forth previously.

Returning to the map produced by Jonas Lang LaSelle Meghraj, (2016), one can see the major highways and the cities they connect to. As seen in Figure 13, areas such as Bangalore (No. 4), which are large markets in and of themselves and are in close proximity to highways which connect them to other markets such as Chennai (No. 3, East) or Hyderabad (No. 6, In North Central), could serve as an excellent location for an early DC. Similarly, Mumbai (No. 2), in addition to being the largest container port, is also a large market and has strong connections to both North and South. New Delhi, (No. 1) also meets these criteria with strong connections southbound to Hyderabad, and eastwards to Kolkata (No. 5).

Figure 13. Road Network in India. Source: Jonas Lang LaSelle Meghraj, 2016. Pg. 14

Here, the issue with different state laws and corruption at the border checkpoints becomes quickly apparent. Since in most instances the goods have to be transported across several state borders, the risk of delays associated with issues with paperwork or demands for additional payments in the form of bribes, increases substantially. Fortunately, recent legislation and the introduction of the GST has decreased the required paperwork substantially. These developments also decreases the opportunity for state border personnel to demand bribes. In the event that such demands persist, IKEA will use the same approach as they do with port authorities and simply refuse. Again, this approach will likely cause delays in the short-term however, the goal is that these demands will decrease and as a result, create a more reliable and cost efficient transport solution in the future.

6.3 Number of DCs and Size of DCs in Europe

Though the quality of infrastructure is rather high in most of the European countries that IKEA operates in, the company still has several DCs there. In fact, presently 16-18 DCs serve the European market. This can partially be explained by the fact that Europe is still, by a large margin, IKEA's largest market. Since the European market accounts for approximately 75% of

IKEAs sales volume, there will naturally need to be more DCs. Here it is also important to note that between the early 2000s and 2018, total sales revenue and volume in Europe still increased even as other markets experienced rapid growth. Furthermore, it was argued that benefits with centralization and size only exist until warehouses are approximately 200,000 m2 at which point overhead costs typically begin to increase again. In such instances, automation would be needed to further increase productivity as was done with the DC in Dortmund. That would, however, require high investments. While the warehouse in Germany serves as an excellent example of a larger and highly automated DC, this is most often not the approach that IKEA uses. Oftentimes, IKEA opts to build new DCs. This may seem contrary to what McKinnon (2009) argued in relation to transport costs and size of DCs, especially since the road infrastructure in Europe is rather well developed and since there are substantial volumes sold in Europe. Nonetheless, one should bear in mind that there are also a wide array of suppliers which are active within Europe. This means, much like Lumsden (2006) argued, that if there is too much centralization total transport distances will increase. This is especially important to note as the main benefit behind centralization relates to achieving greater costs of scale. However, if costs of scale are already high, the potential cost savings decrease. Furthermore, since IKEA is currently expanding their business model by introducing Customer DCs, the decentralized distribution strategy is more reasonable as emphasis is then placed on customer responsiveness rather than achieving higher economies of scale, which is a similar approach to what many online retailers are using, as mentioned by Bendoly, et al. (2007) and Mattarocci & Pekdemir, (2017).

6.4 Number of DCs and Size of DCs in India

Bearing in mind the factors analyzed in the previous section, the main focus of IKEA as for any retailer, is related to reaction time. This is particularly true as IKEA is new to the market and is therefore more likely to have sales forecasts which will need to be frequently updated. The lack of experience in the market also means that it is more likely that there will be significant delays as certain products are sourced from outside India. There may also be several delays, as mentioned previously, due to the unreliable infrastructure and strikes or delays in customs clearance. These factors all impact the supply risk and would all indicate that IKEA should utilize a decentralized distribution strategy with several smaller DCs to supply the market once IKEA has managed to secure a position in the market. In the early stages, the prevailing plan is to utilize 3 DCs to support the first 25 stores in India. Each DC is aimed to supply a major cluster of stores which will be developed in the northern region of India, near New Delhi, the

Central region near Mumbai, and the southern region, near Bangalore. This is evidence of regionalized distribution strategy as indicated by Notteboom & Rodrigue, (2010). These DCs will likely be similar in size to their European or North American counterparts even if the number of customers are fewer. This is due to that fact that in order to compensate for delays or any other disruption in the supply chain and improve reaction time, the DCs in India need to hold larger inventories. Therefore, they will have higher inventory levels and lower turnover of stock compared to their European counterparts.

However, it is very likely that IKEA will face a similar situation in India as they do in Europe. As sales volumes grow, the need for more warehouses and DCs grows as well. Though there are achievable economies of scale with more centralization this is only true up to a certain size. This is a fact often neglected in much of the available literature. Therefore, to have a CDC to serve the entire market is not very feasible. However, whether or not they will utilize a distribution network around regional DCs or local DCs is still a highly relevant question, especially if IKEA intends to introduce the customer DCs as they have done in Europe. Furthermore, since it is part of the overall strategy to have more DCs in order to improve customer responsiveness, it is unlikely that IKEA will have fewer DCs than the proposed 3.

Returning to the model introduced by McKinnon, (2009), we see that due to the infrastructural limitations, delivery costs and thereby total distribution costs must increase. The increase would thereby cause a shift in the curve indicating a higher number of warehouses as McKinnon (2009) suggested:
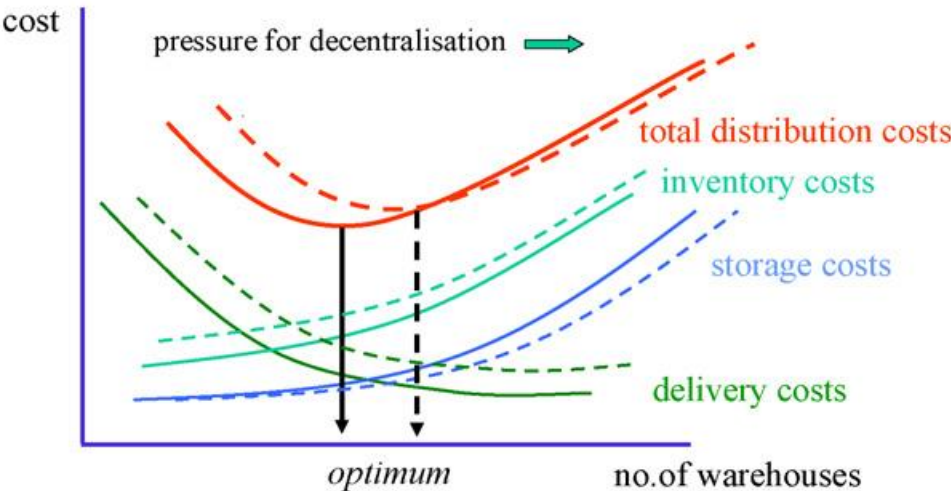

Figure 14. Number of Warehouses and Costs. Source: McKinnon, 2009. pg. 297.

As McKinnon (2009) proposed in his model, a rise in delivery costs would raise distribution costs which would increase the optimum number of warehouses, assuming inventory costs and storage costs remain constant.

Bearing in mind the potential delays and other disruptions that may be caused due to changing legal requirements or strikes, there may be evidence to support the development of more DCs in several states. New legislation, strikes or problems at the border checkpoints that restrict the flow of goods into a particular state can be extremely disruptive if the DC supplying the greater region is in that state. This reasoning is closely related to that applied by Mulky (2013) when discussing tax differences between the different states. Though the new single tax may have decreased some of the regional political hurdles, it is clear that other hurdles remain. In general. if speeds and reliability of transport decrease, this increases the supply risk which thereby increases the pressure to utilize a decentralized distribution strategy, as indicated by Zsidisin & Ellram, (2003), Lumsden (2006), McKinnon (2009) and Schmitt et al. (2015). Depending on where the production base in India will be located, it could also be beneficial to have several DCs in several states to minimize the amount of goods that need to be transported across the state borders and thereby minimize the delays associated with paperwork and corruption. Returning to the problem of acquiring land, it is also likely to prove challenging to buy more parcels of land that are directly adjacent to the existing DCs, in the event of an expansion, than it would be to buy land elsewhere since there would be more options to choose between when purchasing new parcels.

Since IKEA will continue to develop their supplier base in India, the percentage of imported goods will likely decrease. This has several implications. While it may be tempting to develop a more port oriented distribution network based on IKEA's current ration of imported goods, this may not be the best long-term strategy as IKEA increases its local sourcing. This could explain the rationale behind limiting development to 3 DCs by 2025. However, since IKEA is a global sourcing company, good connectivity to the port would still remain paramount for its operations especially as the supplier base in India grows.

7. Conclusion

In the conclusion, the research question along with its sub questions will be answered and suggestions based on the analysis will be presented.

The goal of this thesis was to analyze IKEA's European distribution network and compare that to how they can develop it in India. The primary research question was therefore:

-How can IKEA develop their distribution network in India compared to how it is in Europe?

In order to answer the primary research question, four sub questions had to be addressed first. These were as follows:

1. *Is there a notable shift in IKEA's ownership structure between Europe and India?*

Since most of the existing public and private warehouses in India are poorly maintained, outdated and inadequate in size using them are not a particularly viable option. Therefore, IKEA will need to build their own warehouses. As has been clearly established, a key difference between the European and Indian market is the difficulty in acquiring land. While this is addressed by collaborating closely with the local governments and allowing them to purchase the land, this is a different approach than what IKEA uses in Europe where it is more common for private actors to fill this function. Therefore, the cooperativeness of the local governments in each state have an impact on the location. These differences do not appear to have any particular impact on the ownership structure however, just like in Europe and most other markets, IKEA will own the vast majority of the land and structures that they use for distribution in India. While IKEA occasionally uses 3PLs for their European operations, this is less likely to be done in India due to the lack of 3PLs that are able to handle the required volumes.

2. *How do local governments impact IKEA's warehouse location selection in Europe and India respectively?*

There are substantial differences in how collaborative local governments in Europe are compared to local governments in India. Whereas many local governments in Europe are hesitant to have a DC built in their region due to the associated pollution and rise in traffic accidents and lower job creation due to the higher degree of automation, this is often not the case in India. On the contrary, local governments are more collaborative and eager to have a DC built in their district. Part of the reason for this is the comparable affordability of labor in India which discourages automation of warehouses and DCs. As such, the cooperativeness of

the local government in Europe are more likely to have a direct impact on the location selection than compared to India. Another reason is the relatively high unemployment or underemployment. However, due to the rapid growth in education and income levels in India, a new challenge becomes apparent, securing future employee supplies in areas with an increasingly mobile population.

However, as previously mentioned, land acquisition remains a challenge in India. Even if the local governments are collaborative, the process of acquiring the land is more complex and time consuming due to the need to first aggregate the smaller parcels of land into one large parcel. Furthermore, once this process is completed, the number of competitors increases as many companies are in need of large land parcels. While competition for land in Europe is also rife, the process of attaining land is much simpler and less time consuming. The result is that it is clearer from the start which locations are suitable for warehouse or DC development.

3. *How do differences in infrastructure and freight transport in the European and Indian market affect IKEA?*

There are substantial differences in terms of infrastructure in Europe and India. Perhaps most importantly, the Indian rail infrastructure has severe limitations which discourage its use. Not only is rail transport highly susceptible to delays there are also issues with pilferage and corruption. These issues greatly diminish the competitiveness of rail in India. Road, is therefore the only viable option even though the road network has limitations as well. Many of the roads are in disrepair and heavily congested. Furthermore, many of the truck transport providers have small fleets of trucks which are badly damaged due to heavy overloading. Combined with the underqualified drivers which are typically employed to minimize costs, the risks of traffic accidents increase substantially. Other sources of delay associated with road transport include the border checkpoints. Each state in India requires several documents that need to be filled in before vehicles are allowed to cross the state borders and it is not uncommon that the border officers take advantage of the situation and hold the vehicles until they receive a bribe. All these factors indicate that the supply risk in India is substantially higher than in Europe. This has several implications. First and foremost, each DC would need to be larger since they would need more inventory to compensate for any potential delay in deliveries. Secondly, there will be a greater emphasis placed on locating the DC and finding areas where high levels of congestion can be avoided and where roads are of decent quality. This can prove challenging as areas with high congestion are typically closer to the employees that IKEA seeks to hire. Regarding rail, it is possible that IKEA may still locate their DCs strategically near a railway

in order to enable future use of the railway system, however, this will not be prioritized. Perhaps once rail becomes more reliable there may be more investments into developing appropriate terminals that can support greater intermodality for IKEA. However, this is not in the immediate future.

4. How many distribution centers will IKEA use to serve the Indian market compared to the European market?

In short, while it is logical to limit the number of DCs to 3 in the early phase of expansion in the Indian market, chances are high that IKEA will use a similar approach as in Europe and utilize several more DCs in order to have a higher degree of customer responsiveness. This is particularly true if they begin producing more within India as chances are that they will continue to use road connectivity to a great extent, meaning that there will be less emphasis on transporting very large volumes at any given time since rail transport is unlikely to be a competitive option in the near future. This is an important factor to mention as the shift in transport modes from road to rail to achieve greater economies of scale was one of the key reasons for having CDCs as argued by Lumsden, (2006). While it may be true that turnover rate will be lower than in Europe due to the unreliable transport times, this is unlikely to change the cost relationship in terms of transport mode and volumes. Bearing in mind the delays associated with transporting goods across state borders in India, it would also be reasonable to assume that it would be in the company's interest to decrease the number of state borders they need to transport goods across, despite the recent developments which have led to a decrease in required paperwork. It is also worth mentioning that if IKEA uses a decentralized distribution strategy in India, the number of trucking companies that could fulfill IKEA's transport needs would increase due to the lower amount of goods that need to be transported to each DC or between each DC and store.

This reasoning is closely associated with that originally proposed by McKinnon (2009) in regards to unreliable transport leading to the development of more DDCs. Contrary to their logic however, is the fact that, IKEA also has a high number of DCs in Europe where transport is more reliable and rail is used to a greater extent, especially for inbound goods. An issue with both arguments is that neither places any particular emphasis on the eventual decreasing economies of scale. Once a DC reaches a particular size, the benefits associated with larger DCs diminishes. Since the European market has continued to grow, there has been a need to build more DCs. Furthermore, partially to compete with online retailers, IKEA is also launching several smaller Customer DCs which effectively function as DDCs in order to improve

customer responsiveness. This service may also be launched in India once the company is able to properly establish itself there. Naturally, the exact number of DCs that will serve the market depends heavily on the number of paying customers that exist in the market. It is likely that the number of DCs will gradually grow in relation to the customer base, similar to how the European customer base developed.

8. Delimitations & Further Research

Though this case study has examined the impacts that land acquisition, ownership structure, and infrastructure has on a distribution system based on a simplified version of the framework introduced by Lumsden (2006), it is important to acknowledge that there are several other factors that need to be addressed. Since this study analyzed distribution networks from a broader perspective, more specific areas of focus could warrant several studies. While the regional differences within India were briefly examined, this is an area that needs further research as it can greatly impact where different DCs are located and therefore, the distances between the DCs and the markets. Factors such as regional specific land availability, government cooperativeness and aims, and supporting industries or suppliers require particular attention. Additional attention should also be placed on the different regions and their planned infrastructure projects. A region that may currently appear to have lacking infrastructure may see rapid change during the upcoming years which could impact its attractiveness from a distribution standpoint. Since this study is focused on IKEA, additional studies about companies in other industries could also be conducted. It should also be mentioned that this study was produced in the early stages of IKEA's Indian market development. At the time of writing, very little of the distribution network has been developed meaning that there could have been unforeseen variables impacting costs and the overall strategy.

9. References

Adams, C. D., Russell, L., & Taylor-Russell, C. S. (1993). Development constraints, market processes and the supply of industrial land. *Journal of Property Research*, *10*(1), 49-61.

Baral, C. (2000). Abductive reasoning through filtering. *Artificial Intelligence. 120*(1), 1-28.

Barratt, M., Choi, T.Y., & Li, M. (2011). Qualitative case studies in operations management: Trends, research outcomes, and future research implications. *Journal of Operations Management, 29*(4), 329–342.

Bask, A., Roso, V., Andersson, D., & Hämäläinen, E. (2014). Development of seaport–dry port dyads: two cases from Northern Europe. *Journal of Transport Geography*, *39*, 85-95.

Beria, P., Quinet, E., De Rus, G., & Schulz, C. (2012). A comparison of rail liberalisation levels across four European countries. *Research in Transportation Economics*, *36*(1), 110-120.

Bendoly, E., Blocher, D., Bretthauer, K. M., & Venkataramanan, M. A. (2007). Service and cost benefits through clicks-and-mortar integration: Implications for the centralization/decentralization debate. *European Journal of Operational Research*, *180*(1), 426-442.

Blumberg, B., Cooper, D.R., & Schindler, P.S. 2005. Business Research Methods, Second European Edition. *McGraw-Hill Education. Berkshire.*

Butler, T. (1998). Towards a hermeneutic method for interpretive research in information systems. Journal of Information Technology, 13(4), 285-300.

Cidell, J. (2010). Concentration and decentralization: the new geography of freight distribution in US metropolitan areas. *Journal of Transport Geography* 18, 363–371.

Chandra, P., & Jain, N. (2009). The logistics sector in India: Overview and challenges. In *Indian Economic Superpower: Fiction or Future?* (pp. 105-134).

Collis, J, & Hussey, R. (2013). *Business Research: A Practical Guide for Undergraduate and Postgraduate Students* (Fourth ed.). Palgrave Higher Ed M.U.A.

Cook, P. D., Das, S., Aeppli, A., & Martland, C. (1999). Key factors in road-rail mode choice in India: applying the logistics cost approach. In *Simulation Conference Proceedings, 1999 Winter* (Vol. 2, pp. 1280-1286). IEEE.

Dahlquist, H. (2003. 30th Oct). Ikea monterar ner sitt tågbolag. *NyTeknik.* Available at: https://www.nyteknik.se/digitalisering/ikea-monterar-ner-sitt-tagbolag-6446292 Last accessed: 03-April-2018.

Dash, R.K. & Sharma, C. (2011) FDI, Trade, and Growth Dynamics: New Evidence from the Post-Reform India, *The International Trade Journal*, 25(2),

Deloitte (2014). Indian Logistics Focus on Infrastructure Creation to Sustain and Drive Growth. Available at: https://www2.deloitte.com/content/dam/Deloitte/in/Documents/IMO/in-imo-indian_logistics_focus_on_infrastructure-noexp.pdf Last accessed: 5 Feb 2018.

Dubois, A., & Gadde, L.E. (2002). Systematic combining: an abductive approach to case research. *Journal of Business Research.55*(7). 553– 560.

Eisenhardt, K.M. (1989). Building Theories from Case Study Research. T*he Academy of Management Review, 14*(4), 532-550.

EY. (2013). The Indian Warehousing Industry: An Overview. Available at: http://www.ey.com/Publication/vwLUAssets/The-Indian-Warehousing-Industry-An-Overview/$FILE/EY-The-Indian-Warehousing-Industry-An-Overview.pdf Last accessed: 5 Feb 2018.

Farokhi, F., & Johansson, K. H. (2013, October). A game-theoretic framework for studying truck platooning incentives. In *Intelligent Transportation Systems-(ITSC), 2013 16th International IEEE Conference on* (pp. 1253-1260). IEEE.

Financial Express, Nov 2. (2017). IKEA goes big on India with Gurgaon land buy; here's what it plans to do. Available at: http://www.financialexpress.com/industry/ikeas-big-india-plan-company-picks-up-10-acres-in-gurgaon-for-rs-842-crore/916781/ Last Accessed: 23-Jan-18.

Gibbs, G., 2007. Analyzing Qualitative Data, London: SAGE Publications, Ltd.

Ghosh, S., Banerjee, A., Sharma, N., Agarwal, S., Ganguly, N., Bhattacharya, S., & Mukherjee, A. (2011). Statistical analysis of the Indian railway network: a complex network approach. *Acta Physica Polonica B Proceedings Supplement*, *4*(2), 123-138.

Govind, D. (2017, May 24th) Ikea to follow three-step retail strategy in India: CEO Juvencio Maeztu. *Livemint*. Available at: https://www.livemint.com/Industry/a8SVLF8lze2g7gfjf4sfKN/Ikea-to-follow-threestep-retail-strategy-in-India-CEO-Juve.html Last accessed: 6th-April-2018.

Haralambides, H., & Gujar, G. (2011). The Indian dry ports sector, pricing policies and opportunities for public-private partnerships. *Research in Transportation Economics*, *33*(1), 51-58.

Hanaoka, S., & Regmi, M. B. (2011). Promoting intermodal freight transport through the development of dry ports in Asia: An environmental perspective. *IATSS Research*, *35*(1), 16-23.

Hesse, M. (2004). Land for logistics: locational dynamics, real estate markets and political regulation of regional distribution complexes. *Tijdschrift voor economische en sociale geografie*, *95*(2), 162-173.

Hesse, M., & Rodrigue, J. P. (2004). The transport geography of logistics and freight distribution. *Journal of transport geography*, *12*(3), 171-184.

Higgins, C., Ferguson, M., & Kanaroglou, P. (2012). Varieties of logistics centers: Developing standardized typology and hierarchy. *Transportation Research Record: Journal of the Transportation Research Board*, (2288), 9-18.

Higginson, J. K., & Bookbinder, J. H. (2005). Distribution centres in supply chain operations. In *Logistics Systems: Design and Optimization* (pp. 67-91). Springer, Boston, MA.

IKEA India, (2018), Available at: http://ikea.in/ikea-india Last accessed: 20-03-2018

IKEA Industry (2018), Available at: http://inter.ikea.com/en/inter-ikea-group/ikea-industry/ Last accessed: 07-05-2018.

IKEA, Purchasing, (2018) Available at: https://www.ikea.com/ms/en_AU/about_ikea/facts_and_figures/index.html Last accessed: 20-03-2018

Jain, R. & Raghuram, G. (2013). RSWC and SSLL: PPP in Agri Warehousing. *Indian Institute of Management Ahmedabad.*

Jain, V. (2017, 31st May). Ikea to open third India store in Bengaluru, acquires 14 acres land parcel. *Economic Times.* Available at: https://retail.economictimes.indiatimes.com/news/home-and-decor/furniture-and-decor/ikea-to-open-third-india-store-in-bengaluru-acquires-14-acres-land-parcel/58929382 Last Accessed: 13-Feb-18

James, N., & Busher, H. (2006). Credibility, Authenticity and Voice: Dilemmas in Online Interviewing. *Qualitative Research,* 6 (3) 403–420.

Johansson, U., & Thelander, Å. (2009). A standardised approach to the world? IKEA in China. *International Journal of Quality and Service Sciences*, *1*(2), 199-219.

Jonas Lang LaSelle Meghraj (2016) The Transforming Landscape of Indian Warehousing. Available at: http://www.jll.co.in/india/en-gb/Research/The%20Transforming%20Landscape%20of%20Indian%20Warehousing.pdf Last Accessed: 6-April-2018.

Kay, M. G. (2015).Warehousing. *Fitts Dept. of Industrial and Systems Engineering North Carolina State University.*

Ketokivi, M. & Choi, T. (2014). Renaissance of case research as a scientific method. *Journal of Operations Management* 32, 232–240.

Klevås, J, (2005), *Organization of packaging resources at a product-developing company*, International Journal of Physical Distribution & Logistics Management, Vol. 35 Iss 2 pp. 116 - 131

Knight Frank, (2016) India Warehousing Market Report. Available at: https://kfcontent.blob.core.windows.net/research/677/documents/en/2016-4096.pdf Last accessed: 15-Feb-18.

De Koster, M. B. M., & Warffemius, P. M. J. (2005). American, Asian and third-party international warehouse operations in Europe: a performance comparison. *International Journal of Operations & Production Management*, *25*(8), 762-780.

Kreutzberger, E., & Konings, R. (2016). The challenge of appropriate hub terminal and hub-and-spoke network development for seaports and intermodal rail transport in Europe. *Research in Transportation Business & Management*, *19*, 83-96.

Kurosaki, F., & Singh, M. (2016). Comparison of Three Models for Introducing Competition in Rail Freight Transport. *Transportation Research Procedia*, 14, 2820-2829.

Lau, H. C., Jiang, Z. Z., Ip, W. H., & Wang, D. (2010). A credibility-based fuzzy location model with Hurwicz criteria for the design of distribution systems in B2C e-commerce. *Computers & Industrial Engineering*, *59*(4), 873-886.

Lee, A.S. (1991). Integrating Positivist and Interpretive Approaches to Organizational Research. *Organization Science*, *2*(4), 342-365.

Lee, A.S. (1994). Electronic Mail as a Medium for Rich Communication: An Empirical Investigation Using Hermeneutic Interpretation. *MIS Quarterly*, *18*(2), 143-157.

Levien, M. (2012). The land question: special economic zones and the political economy of dispossession in India. *The Journal of Peasant Studies*, 39, (3–4), 933–969.

Lindeborg, J (2017, 31 Aug) Ingen Sydostlänk i Trafikverkets Transportplan. *Svt Nyheter Bleckinge.* Available at: https://www.svt.se/nyheter/lokalt/blekinge/ingen-sydostlank-i-trafikverkets-transportplan Last accessed: 22-03-2018.

Locke, E.A. (2007). The Case for Inductive Theory Building. *Journal of Management,* 33(6), 867-890.

Lumsden, K. (2006). *Logistikens Grunder*. (Second ed). Pozkal. Poland.

Lewis, I., Semeijn, J.J., & Vellenga, D. B. (2001). Issues and initiatives surrounding rail freight transportation in Europe. *Transportation Journal*, 23-31.

Malviya, S. (2018, 16 Feb). IKEA's first India store will come up by mid-2018 *The Economic Times.* Available at: //economictimes.indiatimes.com/articleshow/62953191.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst Last accessed: 20-03-2018.

Malz, A.B. (1994). The Relative Importance of Cost and Quality In the Outsourcing of Warehousing. *Journal Of Business Logistics,* Vol. 15, No. 2, 45-62.

Mattarocci, G., & Pekdemir, D. (2017). An Overview of the Role of Logistics Real Estate Europe. In *Logistic Real Estate Investment and REITs in Europe* (pp. 7-28). Palgrave Macmillan, Cham.

McIntyre, D. (2009, 29 Jan). Memo To Congress: "Buy Land, They Ain't Making Any More Of It" *Time.* Available at: http://content.time.com/time/business/article/0,8599,1874407,00.html Last Accessed: 07-05-2018.

McKinnon, A. (2009). The present and future land requirements of logistical activities. *Land Use Policy*, *26*, S293-S301.

McKinsey & Company (2010). Building India: Transforming the Nation's Logistics Infrastructure. Available at: http://indiawarehousingshow.com/Building_india-Transforming_the_nations_logistics_infrastructure.pdf Last Accessed: 5 Feb 2018.

Ministry of Road Transport and Highways Transport Research Wing (2012). *Basic Road Statistics of India*. New Delhi: Ministry of Road Transport and Highways Transport Research Wing.

Mitra, S. (2006). A survey of third-party logistics (3PL) service providers in India. *IIMB Management Review*, *18*(2), 159-174.

Mitra, S. (2008). Logistics industry: global and Indian perspectives. *Global Business & Economics Anthology, Business & Economics Society International, Worcester*, 130-138.

Mulky, A. G. (2013). Distribution challenges and workable solutions. *IIMB Management Review*, *25*(3), 179-195.

Narain, V. (2009). Growing city, shrinking hinterland: land acquisition, transition and conflict in peri-urban Gurgaon, India. *Environment and Urbanization*, *21*(2), 501-512.

Ng, A. K., & Cetin, I. B. (2012). Locational characteristics of dry ports in developing economies: some lessons from Northern India. *Regional Studies*, *46*(6), 757-773.

Notteboom, T. & Rodrigue, J.P. (2005). Port Regionalization: Towards a New Phase in Port Development. *Maritime Policy & Management.*

Notteboom, T., & Rodrigue, J. P. (2009). Inland terminals within North American and European supply chains. *Transport and communications bulletin for Asia and the Pacific*, *78*(1), 1-39.

Puig, M., Wooldridge, C., & Darbra, R. M. (2014). Identification and selection of environmental performance indicators for sustainable port development. *Marine pollution bulletin*, *81*(1), 124-130.

PWC (2011). Building warehousing competitiveness. [online] Available at: https://www.pwc.in/assets/pdfs/publications-2011/building-warehousing-competitiveness-india.pdf Last Accessed: 1 Feb. 2018.

Raimbault, N., Andriankaja, D., & Paffoni, E. (2012). Understanding the diversity of logistics facilities in the Paris region. *Procedia-Social and Behavioral Sciences*, *39*, 543-555.

Raghuram, G. & Mehta, P. (2011). The Yamuna Expressway. *Indian Institute of Management Ahmedabad & Lal Bahadur Shastri National Academy of Administration – UK, India.*

Raghuram, G., Udayakumar, P. D., & Prajapati, R. (2017). Effect of Legal Issues in Infrastructure Development: The Case of Container Terminal Bids in Jawaharlal Nehru Port Trust. *Transportation Research Procedia, 25,* 205-232.

Rimienė, K., & Grundey, D. (2007). Logistics centre concept through evolution and definition. *Engineering economics*, *54*(4).

Rodrigue, J. P. (2008). The Thruport concept and transmodal rail freight distribution in North America. *Journal of Transport Geography*, *16*(4), 233-246.

Rodrigue, J.P. Comtois, C. Slack, B. (2006). *The Geography of Transport Systems*. Routledge, New York.

Rodrigue, J. P., & Notteboom, T. (2010). Comparative North American and European gateway logistics: the regionalism of freight distribution. *Journal of Transport Geography*, *18*(4), 497-507.

Rodrigue, J. P., & Notteboom, T. (2012). Dry ports in European and North American intermodal rail systems: Two of a kind? *Research in Transportation Business & Management* 5, 4–15.

Roso, V., Woxenius, J., & Lumsden, K. (2009). The dry port concept: connecting container seaports with the hinterland. *Journal of Transport Geography*, *17*(5), 338-345.

Roso, V., Woxenius, J., & Olandersson, G. (2006). Organisation of Swedish dry port terminals. *Göteborg, Sweden: Chalmers University of Technology*.

Rushton, A., Croucher, P and Baker, P (2014). *The Handbook of Logistics and Distribution Management*, 5th Edition. Kogan Page. London.

Salhotra, B. (2007). Concession for Nhava Sheva International Container Terminal. Planning Commission. Secretariat for the Committee on Infrastructure.

Saunders, M. Lewis, P., & Thornhill, A. (2009). *Research Methods for Business Students.* (5th Ed.). UK: Pearson Education Limited

Schmitt, A.J. Sun, S.A. Snyder, L.V. Shen, Z.M. (2015). Centralization versus decentralization: Risk pooling, risk diversification, and supply chain disruptions. *Omega* 52, 201–212.

Skalak, P., & Turk, M. (2006). Analysis of logistics differences within the European Union with recommendations for Turkey as a candidate.

Shankwitz, C. (2017). Long-haul Truck Freight Transport and the Role of Automation: Collaborative Human–Automated Platooned Trucks Alliance (CHAPTA). *Montana State University, Western Transportation Institute. Working Paper April*.

Simon, N.S. & Natarajan, P. (2017). Nonlinearity between Infrastructure Inequality and Growth: Evidence from India. *Review of Market Integration.* 9(1–2) pp. 66–82.

Singh, S. P., Sandhu, A. P. S., Singh, J., & Joneson, E. (2007). Measurement and analysis of truck and rail shipping environment in India. *Packaging Technology and Science*, *20*(6), 381-392.

Snyder, L. V., & Shen, Z. J. M. (2006). Supply and demand uncertainty in multi-echelon supply chains. *Submitted for publication, Lehigh University*, *15*.

Song, D. W., & Panayides, P. M. (2008). Global supply chain and port/terminal: integration and competitiveness. *Maritime Policy & Management*, *35*(1), 73-87.

Stake, R. E. (1995). *The Art of Case Study Research*. USA. Sage.

Sternberg, H., Filipiak, M., Hofmann, E., & Hellström, D. (2015). Cabotagestudien-a study on trucking deregulation and cabotage in Scandinavia and beyond.

Subramanian, U., & Arnold, J. (2001). *Forging subregional links in transportation and logistics in South Asia*. World Bank Publications.

Sunitha, G., & Sathischandra, P. (2017). Goods and Services Tax (GST): As a new path in Tax reforms in Indian economy. *International Journal of Research in Finance and Marketing*, *7*(3), 55-66.

Taniguchi, E., Noritake, M., Yamada, T., & Izumitani, T. (1999). Optimal size and location planning of public logistics terminals. *Transportation Research Part E: Logistics and Transportation Review*, *35*(3), 207-222.

Thomas, A. V., Kalidindi, S. N., & Ananthanarayanan, K. A. B. T. (2003). Risk perception analysis of BOT road project participants in India. *Construction Management and Economics*, *21*(4), 393-407.

Trafikverket, Slutrapport (2013, 14 Oct). Sydostlänken sträckan Älmhult - Olofström - Blekinge kustbana.

Wever, R. (2011). Design for Volume Optimization of Packaging for Durable Goods. *Packaging Technology and Science.* 24, 211–222.

World Bank (2017), Mombasa: options for the port city interface - final report, COWI, Woxkonsult, Syagga & Associates, Washington D.C.

Woxenius, J. (1994). *Modelling European Combined Transport as an Industrial system*. Department of Transportation and Logistics. Chalmers University of Technology. 24.

Zsidisin, G. A., & Ellram, L. M. (2003). An agency theory investigation of supply risk m anagement. *Journal of supply chain management*, *39*(2), 15-27.

Zunder, T. H., Islam, D. M. Z., Mortimer, P. N., & Aditjandra, P. T. (2013). How far has open access enabled the growth of cross border pan European rail freight? A case study. *Research in Transportation Business & Management*, *6*, 71-80.

10. Appendix

The interview guides can be found in this section.

10.1 Interview Guide IKEA Personnel:

1) How long have you worked at IKEA? What is your role there?

2) What would you say are the biggest challenges when IKEA enters a new market?

3) Ownership of logistics functions, i.e. are the logistics and distribution functions outsourced or performed in house. Do you own your own delivery vehicles?

4) What is the process from the initial order to delivery?
   i) Steps in the logistics process
   ii) Economies of scale
   iii) Delivery windows
   iv) Reaction time to order
   v) Reaction to changing environment (delayed shipments, congestion etc).

5) When there is a delay from production to warehouse or distribution centre, or what are the most common reasons in Europe? Top 5. 1 being the most common.

6) What is the potential cost of a delay? (non-economical and economical) based on top reasons from last question.

7) When deciding on a location of a Distribution Centre what were the primary attributes you sought?

8) What type of ownership does IKEA prefer for its Warehouses? Private, Public etc. Why?

9) What are the primary obstacles in finding a good location for a distribution centre?

10) How many distribution centres are currently serving the European market?

11) Where are/will the largest distribution centres serving the market be located?

12) How large would you say the average distribution centre is in Europe?

13) What type of volumes are you expecting at the different locations? AND/OR which regions do you forecast the largest amount of sales.

14) If any, what other key themes or ideas do you consider of importance in relation to distribution network development which have not been covered by the questions in the previous sections?

Follow up:

1. In terms of rail connectivity, during the last interview you mentioned that there were issues in terms of the reliability of rail. You mentioned that there was a lack of trains, pilferage but you also mentioned reliability in terms of time? Once the goods have made it onto the train what makes rail so unreliable from a time standpoint?

2. Since IKEA has yet to open their first store how do you know that there is so much pilferage by rail? What is this info based on?

3. Since you mentioned that it is likely that IKEA will primarily utilize road for transporting goods, what type of transport companies will you use? Since many transport companies in India are rather small and have rather few vehicles.

4. How do you ensure that they (the trucking companies) follow your safety standards?

5. Another interviewee also mentioned that many times the checkpoint authorities will also demand a bribe in order to let the vehicle pass through. Is this an issue that you predict will impact IKEAs operations? If yes, how do you aim to tackle this challenge, and if not, why not?

6. You mention land aggregation previously, meaning that normally the government secures the land and then you buy it from the government. Is there a notable difference in how collaborative various governments are?

7. What are the downsides of relying on the local governments to help aggregate the land?

8. You mentioned how the Indian warehouses will likely keep more inventory at hand in order to secure customer availability. How large do you plan on the three DCs in India being compared to the European counterparts?

9. As IKEA grows in India do you expect there to be a need to establish more DCs or do you plan on just expanding the existing DCs? If we are to use 2050 as a time frame.

10. Who are the main competitors in the Indian market?

10.2 Interview Guide Trucking Company

1. How long have you worked at the trucking company? What was your role there?

2. Which region did you operate in?

3. What type of customers did you have/ what type of products did you transport?

4. What were the main challenges in day to day business?

5. What were the main sources of delay?

6. What was the course of action in the event of a delay?

7. Regarding the type of products, was there any noticeable difference in the type of product you transported and the sources of delay?