



UNIVERSITY OF GOTHENBURG
SCHOOL OF BUSINESS, ECONOMICS AND LAW

Graduate School

Master's Degree Project in Logistics and Transport Management

Logistical Problems caused by Merger and Acquisition

A case study of a horizontal merger in the industrial laundry industry

Daniel Pettersson Vidlund

Thesis:	30 Credits
Level:	Second Cycle
Semester/year:	Spring 2018
Supervisor:	Ove Krafft

Abstract

There has been an increase of interest in Merger & Acquisitions since the early 1990's and the framework has been well researched. However, research regarding the logistical aspects with Merger & Acquisition has been few. Previous scholars have covered several areas in the framework of Merger & Acquisition as well as some logistical aspects, but the topic of logistical problems regarding circulation products and relocation of the production facility has not been researched. In this thesis, the author investigates the logistical problems related to relocation of the production facility together with circulation products. The study collected data through a case study at an industrial laundry in the pre-merger phase where the intent was to engage in merger with a competitor. The results of the study could be used by industrial laundries in the pre-merger phase to increase their knowledge of the logistical problems that can occur when the production facility is moved.

Keywords: Industrial laundry, Circulation products, Reverse logistics, M&A, Merger & Acquisition, Pre-merger.

Acknowledgments

First and foremost, I would like to extend my deepest gratitude to the two industrial laundries that provided this master's thesis with information, data, and allowed me to be a part of their thoughts regarding the planned merger. Furthermore, I would like to thank my supervisor, Ove Krafft, who has provided me with excellent feedback and guidance throughout the writing process. Lastly, I would like to thank the students and people that has taken the time to read through the thesis and contributed with constructive and informative feedback.

A handwritten signature in black ink, reading "Daniel R", with a horizontal line underneath it.

Daniel Pettersson Vidlund

Gothenburg, May 2018

Table of Content

1. Introduction	1
1.1 Merger & Acquisition	1
1.1.1 Previous research in the Merger & Acquisition framework	2
1.1.2 Horizontal Merger & Acquisition	2
1.1.3 The purpose and strategic objective of Merger & Acquisition	3
1.2 Problem Discussion	3
1.3 Purpose of the Study	6
1.4 Delimitations	6
1.5 Project outline	7
2. Theoretical framework	9
2.1 Small and Medium-sized Enterprises	9
2.2 Motives behind Merger & Acquisition	9
2.2.1 Value-increasing and Value-destroying theories	9
2.2.2 Growth motives	10
2.2.3 Small and Medium-sized Enterprises and Merger & Acquisition	10
2.3 Business Logistics	11
2.3.1 Reverse logistics	12
2.4 Centralization and Decentralization of warehouses	12
2.5 Inventory Management	14
2.5.1 Different types of inventory	15
2.6 Summary of theoretical framework	15
3. Methodology	17
3.1 Research approach	17
3.2 Case Study	17
3.3 Data collection	18
3.4 Research Quality	19
3.4.1 Credibility	19
3.4.2 Dependability	20
3.4.3 Confirmability	20
3.4.4 Transferability	20
4. Empirical findings	22
4.1 Logistical aspects of Merger & Acquisition	22
4.1.1 Carriers, Truck size, and Driving hours	22
4.1.2 Demand	24

4.1.3 Current logistical flow	24
4.2 Motives to engage in Merger & Acquisition	25
4.2.1 Organization A	25
4.2.2 Capacity increase	26
4.3 Summary of the findings	27
5. Discussion and Analysis	29
5.1 Logistical aspects of Merger & Acquisition	29
5.1.1 Time and distance of transportation	29
5.1.2 Warehousing	29
5.1.3 Choice of Carrier	30
5.1.4 Increase of process steps	31
5.2 Inventory management	32
5.2.1 Increasing the inventory levels	32
5.2.2 increasing the number of transportations	33
5.2.3 Summary of logistical problems	33
5.3 Motives to engage in Merger & Acquisition	34
6. Conclusion and future research	36
6.1 Logistical problems related to Merger & Acquisition	36
6.2 Suggestions to the logistical problems	36
6.3 Motives to engage in Merger & Acquisition	37
6.4 Future research	37
References	
Appendix 1. Interview guide	
Appendix 2. Increased travel time for the laundry	
Appendix 3. Theoretical production capacity	
Appendix 4. Difference between the washing machines	
Appendix 5. Difference between the washing machines cont.	
Appendix 6. Demand visualization	
Appendix 7. Demand visualization cont.	
Appendix 8. Demand visualization cont.	

List of Figures

Figure 1. Merger & Acquisitions in Sweden.....	1
Figure 2. Logistical flow system.....	4
Figure 3. Reverse logistics flow system.....	5
Figure 4. Service level depending on type of warehouse.....	13
Figure 5. Current used carrier.....	22
Figure 6. Comparison of demand.....	24
Figure 7. The process for the industrial laundry.....	25

List of Tables

Table 1. Interview respondents.....	19
Table 2. Difference in carriers	23

Definitions

Carrier

Carrier will be referred to as the wagon used by the organization to package the products to the customer.

Circulation product

The term circulation product will in this thesis refer to as a product that has to be retrieved from the customer, transported back to the production facility, and be re-used in the production.

Industrial laundry

An industrial laundry offers the service of providing the customers with terry, bed linen, and workwear. The customers are hotels, hostels, health spas, manufacturing organizations, and hospitals and geriatric care. In this thesis, the terry and bed linen is owned by the industrial laundry and the customers pay per use of each product.

Merger & Acquisition

Merger & Acquisition will be seen as the same concept in this thesis. The following definition by Gaughan (2011, p.12) will be used:

“A merger is a combination of two corporations in which only one corporation survives, and the merged corporation goes out of existence. In a merger, the acquiring company assumes their assets and liabilities of the merged company”.

1. Introduction

1.1 Merger & Acquisition

The number of Merger & Acquisitions (M&A) have steadily increased throughout the years, and the worldwide transactions of 2017 amounted to 51 268 transactions while the accumulated value of those transactions reached 3591 billion USD (IMAA, 2018a). As for Sweden, there has also been an increase of interest in M&A, *figure 1*. The number of transactions compared to the early 1990's has more than doubled in recent years, however, the value in relation to the number of transactions have varied (IMAA, 2018b). M&A is used by organizations to expand and further grow their business; however, it is not the only means for corporate growth, but can be seen as a substitute to growth by using internal or organic capital investment (Sudarsanam, 1995).

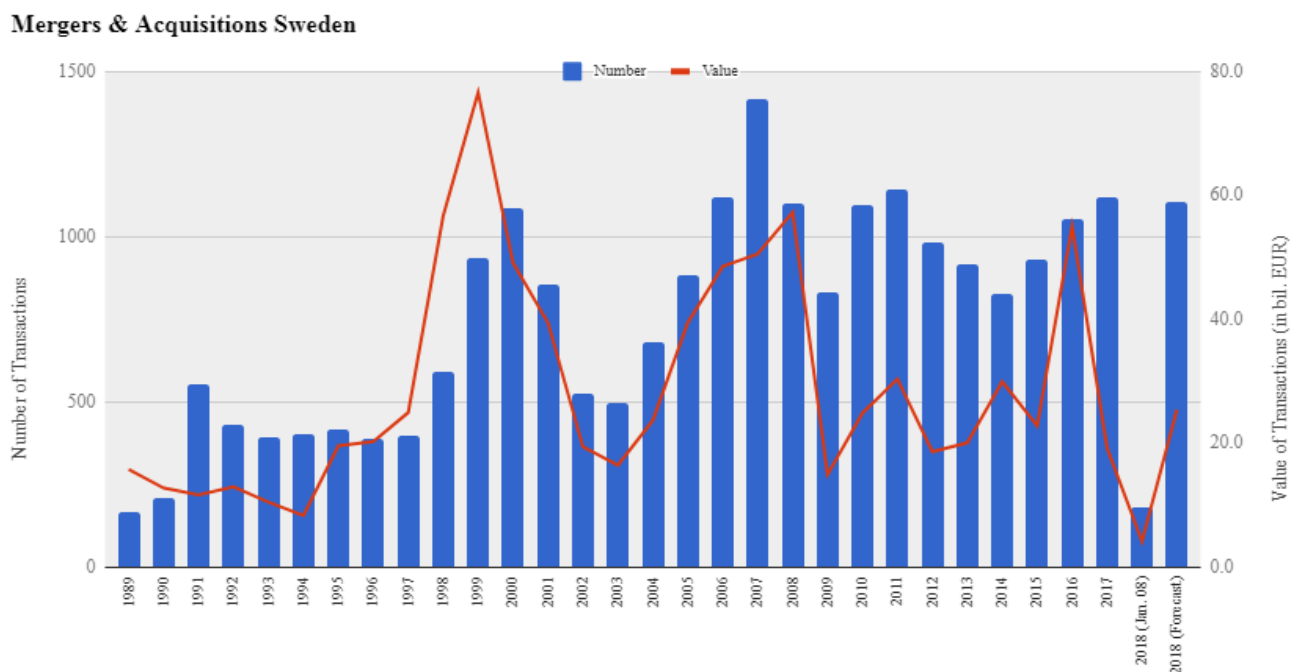


Figure 1: Number of M&As in Sweden and the value of those transactions in billion Euros (IMAA, 2018b).

The objective for organizations that engage in M&A varies for each organization, while objectives related to growth and expansion of assets, sales, and increase of market share of the acquiring organization is common (Sudarsanam, 1995; Gaughan, 2011). There could also

be objectives related to creating a sustainable competitive advantage or to gain synergies (Sudarsanam, 1995; Gaughan, 2011).

1.1.1 Previous research in the Merger & Acquisition framework

The M&A framework has been well researched before. The perspective of human resources and behavioral intentions of employees as a risk of failure has been well documented. Some examples include the psychological factors and integration of cultural differences in acquisitions (Elsass & Veiga, 1994; Cording, Christmann & Bourgeois, 2002). Furthermore, how to setup good strategic human resources before, during, and after acquisitions has also been researched (Schweiger & Weber, 1989; Cartwright & Schoenberg, 2006). Lastly, how to manage the human resource activities when the acquisition occur across country borders has also been investigated (Schuler, Tarique & Jackson, 2004; Aguilera & Dencker, 2004).

Creating synergies through M&A is also a topic that has been well researched. For example, different types of acquisition strategies related to creating synergies and economic value (Chatterjee, 1986), synergies acquired in the post-acquisition phase (Harrison, Hitt, Hoskisson & Ireland, 1991), and product market synergy and potential capacity dis-synergies (Hoberg & Phillips, 2010; Shaver, 2006), has been well documented.

In addition to research regarding human resources and synergies, the effects of different trade-laws and inventory values have also been researched in the M&A framework (Alston, 2002; Shleifer & Vishny, 2003; Travlos, 1987). It is possible to conclude that the research around M&A have included many different views and topics and the M&A framework has been researched since the late 1980's as seen to the reviewed articles, however, research regarding the logistical activities and M&A has been scarce (Häkkinen, Norrman, Hilmola & Ojala, 2004). While there have been studies regarding M&A and the supply chain of organizations (Nagurney, 2009; Zhou, Yang, Cao, 2012), there is a gap in the research that needs further investigation.

1.1.2 Horizontal Merger & Acquisition

There are different types of mergers as explained by Gaughan (2011), and these are categorized as being either horizontal, vertical, or conglomerate. The horizontal merger is when two competitors in the same industry combine and gain possible synergies from each other (ibid, p.13). The horizontal merger creates value through either exploiting cost- or revenue-based synergies that occur between the two organizations (Capron, 1999). Capron

(1999) found that horizontal mergers have been seen as an opportunity to achieve cost savings through economies of scale and scope by previous scholars. This is further strengthened by more recent literature as well (Grajek, Gugler, Kretschmer & Miscisin, 2017). In addition to finding cost savings through M&A, it is also of importance for the organization to increase their efficiency to be able to reduce the cost related to logistical activities. The cost concerning logistical activities has been high in many industries and finding possible efficiency increase in those activities has been of focus in both theory and practice (Caputo & Mininno, 1996; Wiengarten, Pagell, Ahmed & Gimenez, 2014). The logistical activities that needs to be focused to achieve lower cost are called the “channel distribution” and involve; order management, inventory management, warehousing, material handling, packaging & unitization, and transportation (Caputo & Mininno, 1996).

1.1.3 The purpose and strategic objective of Merger & Acquisition

To create a sustainable competitive advantage is one of the objectives for organizations when engaging in M&A (Sudarsanam, 1995). In order to achieve a competitive advantage, the acquirer has to focus on the strategic objective of the organization (ibid). These strategic objectives could for example include growth of the organization, growth in market, and even risk reduction (ibid). The M&A process should involve creating value for the organization and this value can be created by putting the acquisition in context to what the organization actually wants to achieve in their strategic framework (ibid). In relation to creating a sustainable competitive advantage, Darkow, Kaup, and Schiereck (2008) found that M&As which purpose was to strengthen the organization's logistical activities generally created value and could be considered as successful. Furthermore, to acquire competitors and to gain access to new geographical markets is a strategy well used by organizations, however, it might come with problems related to distance and integration costs, which could deny the value creation (ibid). In addition, it has been found that around 25% of M&As reach all their desired objectives, and there is a correlation between how effectively the supply chains are integrated in the merging organizations and the success of M&As, and thus, one key to a successful M&A would be to improve the logistical activities (Nagurney, 2009).

1.2 Problem Discussion

The traditional situation for a manufacturing organization has been the usage of forward logistics, where the flow of information and materials only travel forward and rarely backwards (Tibben-Lembke & Rogers, 2002). The product is bought, produced, sent to a

distribution point, and then sent directly to the end-customer, and in many cases, the chain has ended as there is no need to collect the product from the customer (ibid). The typical flow of materials and information can be seen in the *figure 2* below. To be successful, the organization has to plan their operations carefully to be able to achieve a high degree of efficiency, which lead to lower cost in their operations (Christopher, 2011).

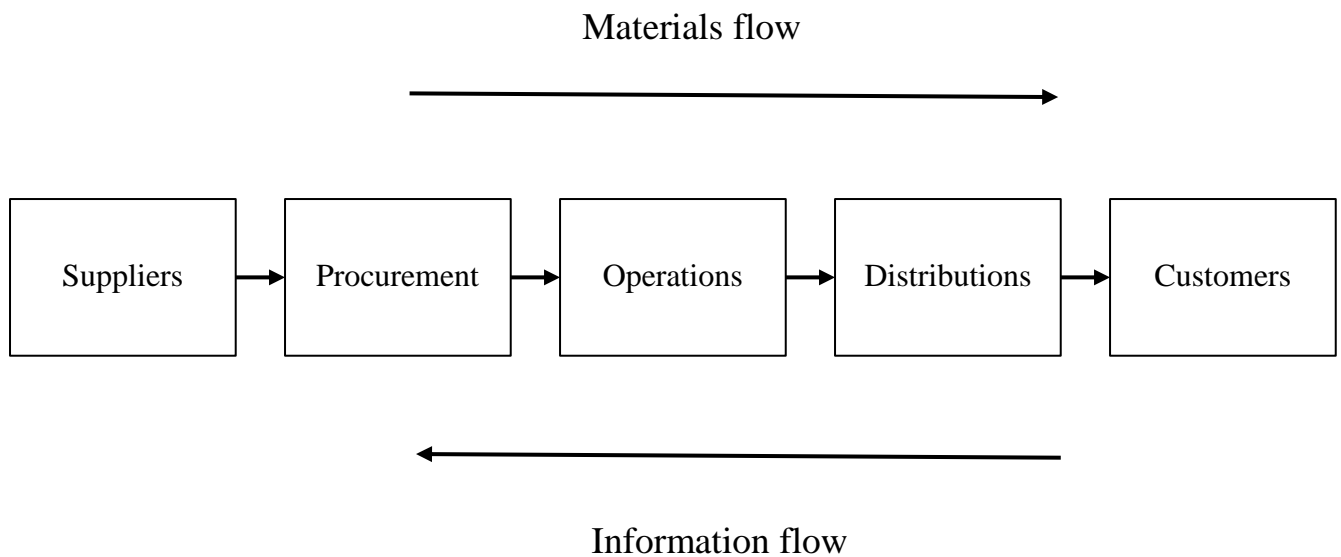


Figure 2. Interpretation of the logistical flow system as described by Christopher (2011, p.11).

This typical logistical flow system does, however, not include the activities for collecting and retrieving the product at the end-customer. If there would be faulty products, or if the organization is working with circulation products, these products has to be brought back into the logistical flow system again. The term *reverse logistics* have emerged to put focus on the challenge to recycle and re-use the product in the production, and there are many different opinions of what reverse logistics should include. An article written by Pohlen & Farris in 1992, gave the following definition on reverse logistics (De Brito & Dekker, 2004, p.2);

“the movement of goods from a consumer towards a producer in a channel of distribution”

With this definition of reverse logistics, it is evident that the traditional logistical flow system needs to be revised and involve the circulation and retrieving of products as well, *figure 3*. The forward logistical flow system involves moving the product from one source of origin to different customers that are located in different geographical destinations (Tibben-Lembke &

Rogers, 2002). The opposite can be said about the reverse logistics flow system, as it involves moving the products from many different geographical origins to one place of destination, which is often the production facility or distribution center (ibid).

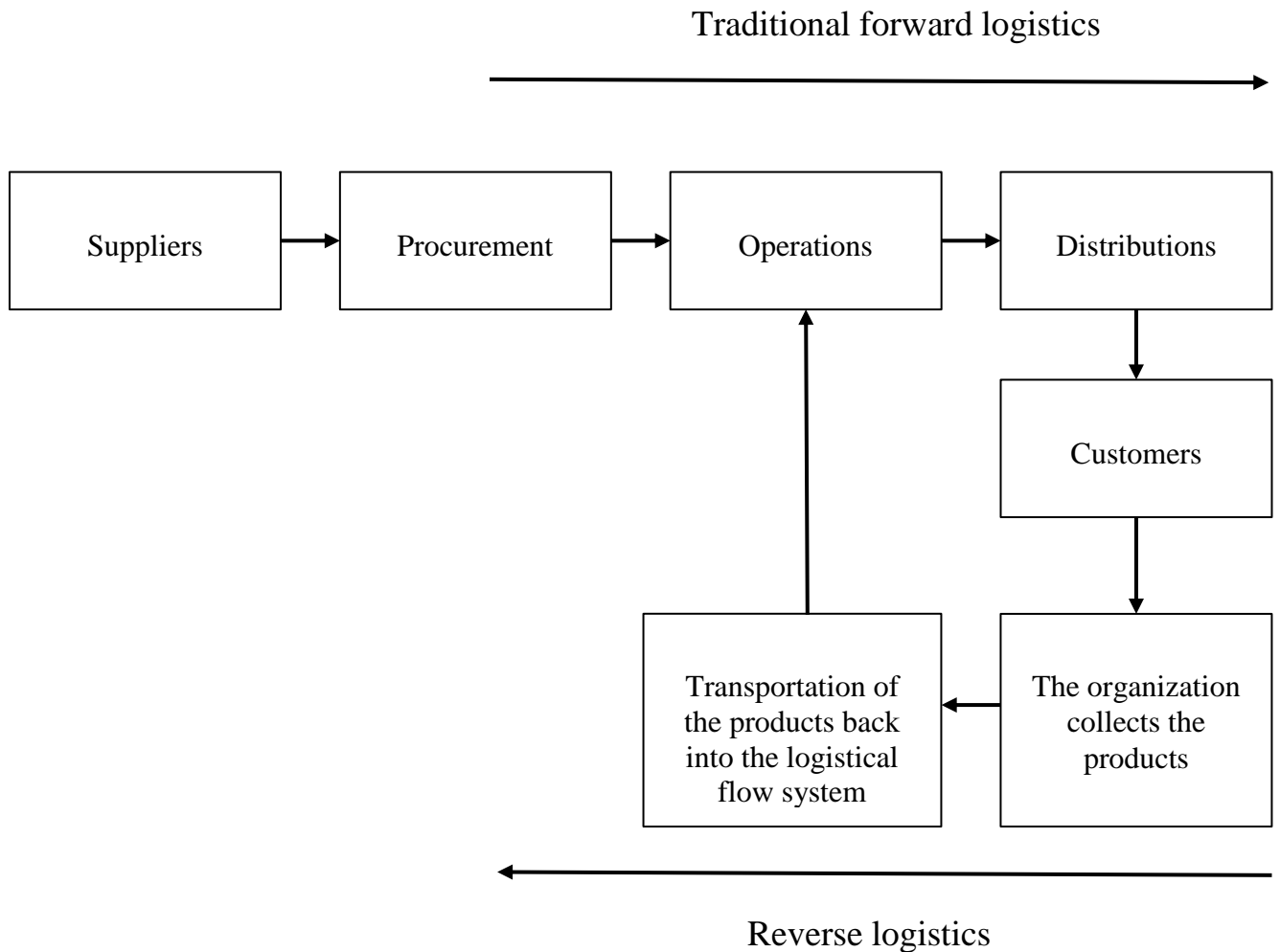


Figure 3: Interpretation of the logistical flow system with added reverse logistics as described by De Brito & Dekker (2004).

In regard to figure 3, the retrieving of products from the customer and circulation of the products into the logistical flow system adds complexity. To successfully implement this in the organizations current logistical flow system has been deemed as a key competence (De Brito & Dekker, 2004; Morgan, Richey & Autry, 2016).

It has been noted that there is limited research on logistical activities and M&A (Häkkinen et al., 2004). In their study the authors found that eight per cent of the articles they reviewed contained logistical issues (ibid). It is also noted by the author of this thesis, that there has

been little research in the field of reverse logistics and M&A as well as with circulation products. As previously mentioned by Darkow et al. (2008), M&As which purpose was to strengthen the logistical activities generally created value for the acquiring organization, and thus, it could be considered important to further investigate the challenges in the logistical activities that is caused by M&A.

This thesis will, with the help of two industrial laundries in the pre-merger phase, investigate the logistical challenges that can occur when the organizations engaging in M&A is located geographically distant from each other and when one of the production facilities will be relocated. Both of these industrial laundries can be classified as a Small and Medium-sized Enterprise and both is located in Sweden. Both of their operations are similar and the same products are offered to their customers. These products are owned by the industrial laundries, which mean that the products being offered can be used to several customers.

1.3 Purpose of the Study

The purpose of the study is to gain better understanding of the logistical challenges caused by M&A and how the industrial laundries can deal with these challenges. The intent is also to see which underlying motives exists for the industrial laundry to engage in M&A.

In order to explain the purpose, the following research questions have been developed:

- Which are the logistical challenges caused by Merger & Acquisition when one of the production facilities is relocated for industrial laundries?
- How can the industrial laundries deal with the logistical challenges caused by Merger & Acquisition when one of the production facilities is relocated?
- Which are the motives for Small and Medium-sized Enterprises, operating in the industrial laundry industry, to engage in Merger & Acquisition?

1.4 Delimitations

The thesis will investigate the logistical problems caused by the relocation of one of the production facilities and the motives behind engaging in M&A for the industrial laundries. The focus of the thesis will be on two industrial laundries that have products that has to be collected and re-used in their production, therefore, organizations in the traditional manufacturing industry will not be considered. This means that organizations with similar characteristics and operations as the industrial laundries could take advantage of the results of

this thesis. Furthermore, the thesis only focus on the material flow that will exist between the investigated organizations and thus, excludes both the cash-flow and information-flow. Lastly, the thesis will not investigate the most optimal warehouse location or inventory level to achieve a high service level.

1.5 Project outline

Introduction

The introduction has introduced the reader to the framework of Merger & Acquisition. The reader has been guided through previous research within the field and have been presented with a gap in the research. In the problem discussion, the traditional logistical flow system has been reviewed and the needed modifications to the flow system to include the reverse logistics have been showcased. Lastly, the purpose of the study is revealed together with the research questions and the delimitations of the study.

Theoretical framework

The objective of the theoretical framework is to give the reader a thorough understanding of the theoretical concepts that was used in order to help the author gain a better understanding of the topic and purpose of the study. The section starts with an introduction to the concept of SMEs and quickly follows through with different motives and risks with Merger & Acquisition. Furthermore, it is showed that the size of the organization might have an impact on the decisions related to M&A. Lastly, the chapter ends with the concept of reverse logistics, the different types of warehouse models, and the importance of inventory management.

Methodology

The methodology will provide the reader with an opportunity to follow the research process the author has done. Furthermore, the methodology gives the reader a possibility to mimic the study as the chosen methods and why they were picked will be presented. The author has clarified how the thesis will reach a high trustworthiness and the chapter ends with how generalizable the study is.

Empirical findings

Through the collected data from the interviews and observations made at the two industrial laundries, the intent is to provide the reader with a better understanding of the motives behind

the intended M&A, the different processes at the industrial laundries, and the volumes that are being produced and needed to be moved between the two organizations.

Analysis

The chapter will discuss and analyze the empirical findings gathered from the case study together with the theoretical framework. Furthermore, the chapter will outline the logistical and practical implications that the Merger & Acquisition could bring for the industrial laundries and the motives as to why the organization wants to engage in Merger & Acquisition.

Conclusion

The conclusion will answer the research questions and the purpose of the study based on the empirical results analyzed in 5. *Discussion and Analysis*. The section will answer the research questions in the same order as structured in 1.3 *Purpose of the Study*. Lastly, the section will suggest interesting future research based on the results from the study and closely related topics which future researchers could investigate further.

2. Theoretical framework

2.1 Small and Medium-sized Enterprises

Small- and Medium-sized Enterprises (SMEs) are defined according to the European Commission (2003) depending on two criteria, first of, the staff headcount, and secondly, the turnover or the total on the balance sheet. In accordance to the European Commission (2003), it is possible to categorize SMEs into three categories;

- Medium-sized, with staff headcount below 250, and turnover below 50 million euros or balance sheet total of below 43 million euros,
- Small-sized, with less staff than 50 people, below 10 million euro in turnover or below 10 million euro in the balance sheet total,
- Micro-sized, with less than 10 people in staff, turnover below 2 million euros or balance sheet total below 2 million euros.

It is mentioned by Storey (2016), that there is more than one definition on how to categorize SMEs, simply because in some industries, or sectors, it is more common to have higher sales and lower staff levels which would contradict for example the European Commission definition of Micro-sized enterprises. The Bolton Committee from 1971 gave the following definition of SMEs (ibid, p.9);

- they have a relatively small share of their marketplace,
- they were managed by owners or part-owners in a personalized way, and not through the medium of a formalized management structure,
- they were independent, in the sense of not forming part of a large enterprise.

2.2 Motives behind Merger & Acquisition

There are many motives for an organization to engage in M&A, the most common is to expand and gain more market share (Gaughan, 2011). It is quicker to expand into new geographical markets through M&A, than it is using internal organization growth (ibid). Furthermore, through M&A it is possible to reach certain synergies that would take time to do on your own and would be very costly (ibid).

2.2.1 Value-increasing and Value-destroying theories

There are two types of value theories in M&A, the value-increasing and the value-destroying (McCarthy & Dolfsma, 2012). The value-increasing part of M&A occur because of synergies

that can be achieved between two or more firms working together, then they would do on their own and thus, increases the value gained by merging or acquiring another organization (McCarthy & Dolfsma, 2012; Gaughan, 2011). Furthermore, if it is not possible to gain synergies or to create any value with the M&A, the deal should be rejected and not take place as the value-increasing theory assumes that the only reason to engage in M&A is to create value (McCarthy & Dolfsma, 2012). The synergies can be divided further into *operating synergy* and *financial synergy*, whereas the operating synergy is focusing on the efficiency being gained through horizontal and vertical mergers, and the financial synergy is focusing on the possibility to obtain lower costs by combining two or more organizations (Gaughan, 2011).

The value-destroying theory focus on if the organization fails to create value and creates an unsuccessful M&A (McCarthy & Dolfsma, 2012). The value-destroying theory can be divided into two different categories; the first one is managers of the organization that are bounded to be rational and thereby make mistakes because of insufficient information or being too confident and not seeing potential problems that can occur (ibid). The second category concerns the managers once again, but in this case, they are rational but self-serving and is able to only maximize one function, however, they are not able to create any positive value for the whole organization (ibid).

2.2.2 Growth motives

M&A has been very popular and very significant for organizations to grow outside their current operating markets, but also to be able to expand and diversify their offerings in terms of products and services to the customers (Nahavandi & Malekzadeh, 1988; Gaughan, 2011). Furthermore, by combining two or more organizations, the market share that is created could have a positive impact on the market power of the organization depending on the size of the different organizations (Gaughan, 2011). In addition to the possible market power being created, the ability to gain access to new markets that the acquirer was not operating on, creates faster entry to market and is often used when the market the acquirer operates on is considered saturated (ibid).

2.2.3 Small and Medium-sized Enterprises and Merger & Acquisition

As the manager of an organization, in most cases, for SMEs are the owner, the different M&A motives will be made in terms of the interest of the owner (McCarthy & Dolfsma, 2012). The risk of value-destroying activities in M&A that are conducted could therefore be

enhanced, as there is a higher possibility of over-confidence by smaller organizations (ibid). However, this has been questioned by Moeller, Schlingemann & Stultz (2004), that found that of over twelve thousand mergers, the larger organization was more likely to complete the transaction and they suggest that it is, therefore, more common for larger organizations to be more overconfident. In addition, Moeller et al. (2004) argues that for SMEs, the manager has the same level of bounded rationality and thus, makes the same mistakes as the managers for larger organizations, however, as the interests of the manager in SMEs is closer aligned with the owner (as they are often the same person), the SMEs is more likely to withdraw from a negative deal and realize their mistakes sooner than larger organizations. In addition, the size of the organization engaging in M&A is important, as it has been found that larger deals perform worse in general than smaller deals and that would lead to SMEs performing better in terms of M&A (McCarthy & Dolfsma, 2012; Moeller et al., 2004). Therefore, M&A as a growth strategy for SMEs could be considered important as they perform better and more often create value for the organization (McCarthy & Dolfsma, 2012; Moeller et al., 2004).

2.3 Business Logistics

Logistics activities has been seen as crucial for commercial businesses and have gained more traction since the early 2000's (Vogt, Pienaar, De Wit, 2002). Furthermore, logistic activities were used mainly in the military context to be able to feed, look after, and support military troops (ibid), but the definition regarding logistics and the different types of logistics has changed over the years. The Council of Logistic Management provide us with the following definition of business logistics;

“Logistics is the process of planning, implementing, and controlling the efficient, effective flow and storage of goods, services, and related information from point-of-origin to point-of-consumption for the purpose of conforming to customer requirements” (Vogt et al., 2002, p. 6).

The definition of what business logistics is has changed through the years. There has been focus on the material flow, the operative function of logistics, and even the importance of including the financial part of logistics and the human factor in handling the logistical activities (Lumsden, 2007). There has also been focus on the reverse logistics and the importance of achieving efficient and low-cost supply chains, both, in order to delivering the products to the end customer and also to be able to retrieve the products and reuse it in the production flow (De Brito & Dekker, 2004).

2.3.1 Reverse logistics

The traditional material flow is focused on moving the material towards the customer, however, this becomes problematic when there is a significant increase in materials coming back from the customers in terms of refunds, reuse, and recycling (De Brito & Dekker, 2004). Therefore, it is important to consider the logistical activities that is needed to effectively handle the products coming back into the logistical flow system. For an organization to be able to manage the return of products, there will be an increase of complexity and complications for the organization, as they now have to plan and control both the forward and reverse flow of products and information (De Brito & Dekker, 2004; Kleber, 2006). The European Working Group on Reverse Logistics gave the following definition on the activities that are included in reverse logistics;

“The process of planning, implementing and controlling flows of raw materials, in process inventory, and finished goods, from a manufacturing, distribution or use point, to a point of recovery or point of proper disposal” (De Brito & Dekker, 2004, p.3).

With this definition in mind, the importance of the flow of materials and information in the reverse distribution, is a key operation for the organizations to focus on in order to avoid penalties in terms of increased costs, inventory shortage or excess inventory, and loss of value (De Brito & Dekker, 2004; Tibben-Lembke & Rogers, 2002; Kleber, 2006).

2.4 Centralization and Decentralization of warehouses

There are generally two types of warehouse models that is being used by organizations, a centralized- or a decentralized warehouse model. The centralized warehouse model comes with benefits in terms of reduced factory to warehouse transportation costs, improved efficiency in inventory management, and lesser need of safety inventory (Das & Tyagi, 1997). However, the decentralized warehouse model has the benefit of better availability of inventory for the customers which will lead to more sales and lower cost for transportation from the warehouse to customers located far away (ibid).

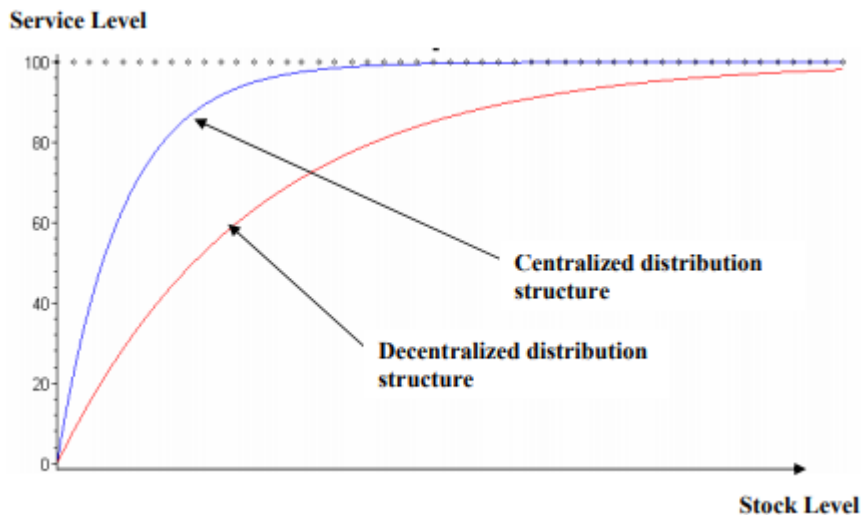


Figure 4: The service level achieved by either using a centralized or decentralized warehouse model in relation to the inventory level (Abrahamsson, 1992, p.242). Visualized by Gassin & Al-Iryani (2005).

Abrahamsson (1992) argues for using a centralized warehouse model as it is possible to achieve a higher service level, while holding less inventory, than a decentralized warehouse model would, see figure 4. Furthermore, the increased service level and lower cost achieved by the centralized warehouse model is due to a decrease in uncertainty and better resource utilization in terms of production and transportation (Çelebi, 2015; Schmitt, Sun, Snyder & Shen, 2015). However, using a centralized warehouse model to achieve a higher service level could be inappropriate if the transportation distance to the customers is long (Çelebi, 2015). Das & Tyagi (1997) investigated the relation between transportation cost, safety and cycle inventory, together with using either a centralized or decentralized warehouse model and found the following result;

1. If the organization do not distribute the products, a centralized warehouse model should be used,
2. If the warehouse serves a purpose of being a distribution point, the customers should be assigned to warehouses located in different geographical areas to achieve as low cost as possible. The longer the transportation distance and transportation cost, the more it favors a decentralized model,
3. Lastly, if the warehouse is both responsible of distribution of products as well as keeping safety inventory and cycle inventory, a trade-off between inventory and transportation costs needs to be taken into consideration. Higher cost of transportation than inventory cost, favors a decentralized warehouse model.

2.5 Inventory Management

According to Jacobs & Chase (2015, pp. 516-517), there can be several reasons to hold inventory, but there are six common reasons;

- To maintain independence of operations,
- To meet variation in product demand,
- To allow flexibility in production scheduling,
- To provide a safeguard for variation in raw material delivery time,
- To take advantage of economic purchase order size,
- And many other domain-specific reasons, such as in-transit inventory.

Silver, Pyke & Peterson (1998) mention that making decisions around inventory management is a complex issue. It extends beyond the ordinary decision maker as it needs to be coordinated, rationalized, and adapted to several different interconnected systems (ibid, p.28). Therefore, it is important for an organization to keep inventory, but more important to be able to rationalize and keep the right amount of inventory. In addition, Jacobs & Chase (2015) mention that the inventory is the largest asset on most organizations balance sheet, and they should therefore visualize the inventory as being money sitting on shelves, forklifts, or in-transit waiting to be collected. This will add further difficulties to the inventory management, as organizations do not only need to satisfy the customers with products on time, but also consider the cost of having excess inventory and the complications with that. Jacobs & Chase (2015) also mention that the average cost of products in inventory is around 30-35% for an American organization, meaning that a value of around ten million USD in inventory, will cost the organization about three million USD, which also concludes the issue with having too much products in inventory.

As mentioned previously, it is important for the organization to be able to minimize the costs related to keeping inventory, but also, to be able to keep the right amount of inventory to avoid shortage costs or stockout. The shortage costs are associated with depletion of the inventory and inquire loss of customer order or cancellation of customer order (Jacobs & Chase, 2015). For organizations, there will be a trade-off regarding having excess inventory in order to satisfy the customers demand and the costs of having low inventory which could result in stockout or backorders that leads to loss of sales (ibid).

2.5.1 Different types of inventory

Silver et al. (1998) suggest four different categories to be able to control the different levels of aggregated inventory;

The first one is *cycle inventory*, it refers to the number of products that the producer is cycling through to satisfy the current rate of customer order, it often occurs due to the production of batches and do not include the safety inventory or having excess inventory (Silver et al., 1998).

The second type of inventory is *safety inventory*, it is the number of products stored as a buffer to allow for uncertainty in demand from customers and is related to the level of customer service the organization wants to provide to their customers (Silver et al., 1998).

The third inventory type is the *anticipation inventory*, it is the number of products that are stored in advance to deal with peaks in sales, for example around holidays (Silver et al., 1998). Furthermore, the anticipation inventory can be used during times when there is low customer activity and when there is possibilities to build excess inventory to be able to offer the products when there is high customer activity again (Silver et al., 1998).

The last inventory type suggested is the *pipeline inventory*. The pipeline inventory is the number of products located in transit, for example being transported within the factory or between warehouses and belongs to the organization until the customer have paid for it (Silver et al., 1998).

2.6 Summary of theoretical framework

The difference in size, operations, and turnover between organizations play a part in the action and decision they take (McCarthy & Dolfsma, 2012; Moeller et al., 2004). Furthermore, the size of the organization also plays a part in the different motives as to why M&A occur between organizations (Moeller et al., 2004). The most common motive to engage in a M&A is growth and this could lead to production facilities being moved in order to achieve cost-efficiencies (Nahavandi & Malekzadeh, 1988; Gaughan, 2011; Capron, 1999). The organization can reduce their costs by focusing on strengthening their logistical activities and thus, create value (Schiereck, 2008), however, the value could be lost due to increased costs related to distance (Darkow et al., 2008). Furthermore, by adding the complexity of transporting the products delivered to the customers back into the logistical

flow system again, while the products now have to travel further distances than previously required, could add further difficulties for the organization.

To satisfy the demand from the customers in a geographical area without a production facility, a decentralized warehouse model could be utilized instead and reduce the transportation cost and transportation time per customer order (Das & Tyagi, 1997). However, this requires an effective inventory management as well as to reduce the unnecessary cost related to inventory becomes even more important (ibid).

3. Methodology

3.1 Research approach

To fully understand and to answer the research questions this study investigated, a case study on two industrial laundries in the pre-merger phase was conducted. The study undertook an interpretivism paradigm. This paradigm was chosen because the reasons as to why the organization would engage in M&A is dependent on the beliefs of the CEO at Org. A. It is believed by the interpretivism paradigm that the context, time, and people shape the outcomes (Collis & Hussey, 2014). Furthermore, as it has been noted that there is little previous research in the field of M&A and logistics, and the purpose of the study was to achieve new knowledge and theory in this field, and not to investigate previous theory. The study undertook an inductive approach and it is said by Farquhar (2012) that using an inductive approach to a case study is preferred, as it helps to generate theory through the data collected. In contrary to the deductive approach with moving from theory into more detail by forming hypotheses and testing those by collecting observations and findings, the inductive approach is moving the opposite direction, from observations and findings to theory (Bryman & Bell, 2011). Therefore, through the observations, the study was able to identify the logistical problems that was further elaborated on through the theory.

As there is little previous research in the researched area, the exploratory purpose was used in order to help investigate the research questions. The exploratory purpose is used when there is few or no previous research that can help solve an issue or problem and the research is aimed at finding patterns, ideas, and to develop these using techniques such as case studies or observations (Collis & Hussey, 2014). Lastly, as this study uses an interpretivist paradigm, the qualitative method was chosen to get a better understanding of the logistical problems related to M&A. In addition, the qualitative method was used to be able to generate theory through the inductive approach (ibid), and this increased the knowledge related to the logistical problems and M&A, when reverse logistics and circulation of products is involved.

3.2 Case Study

A case study was conducted to investigate the logistical aspects of M&A, mainly focusing on when the production facility is moved and when there are circulation products involved. It has been noted that there is little previous research in the framework of logistics and M&A, and the author of this report found that there was also close to none previous research

focusing on circulation products and reverse logistics together with M&A. As there was little previous research in this field, a case study was suitable as it allows the researcher to focus on a contemporary phenomenon (Bryman & Bell, 2011). The case study was conducted on an industrial laundry that was in the pre-merger phase where the intent was to engage in M&A with a competitor located geographically distant from their current market. This M&A inclined a move of the production facility as it was believed to be more feasible in terms of economies of scale to only use one of the production facilities (CEO Org. A, 2018). The industrial laundry operates in an industry where the products they provide with their service is recycled, in terms of reused, and is delivered again to the customers. This differs from the traditional manufacturing organization, where the product that is being produced is often not reusable or recycled, and thus, the logistical problems that the industrial laundry face will also be different. As the purpose of this study was to investigate the logistical problems in M&As and how organizations best can deal with these problems, a case study conducted on an industrial laundry in the pre-merger phase was deemed suitable to conduct the study on.

3.3 Data collection

Data was collected through both primary and secondary data. The combination of collecting both primary and secondary data is done in order to achieve better understanding of the subject (Collis & Hussey, 2014). The primary data included information from the interviews that was conducted, observations made by the author at the case organization, and information from the production system. The secondary data was collected through previous research in related areas. The framework of this study was collected through using secondary data, which mainly came from databases such as Scopus & GUNDA offered by Gothenburg University - School of Business, Economics, and Law, and Google Scholar.

The interviews were held with the CEOs at both the competitor and the case organization. The decision to only include the CEOs was taken due to both of the organizations was classified as SMEs and the CEOs was the only one able to answer the questions asked and could provide the study with relevant data. The interviews were semi-structured and consisted of an introduction to what the study was about and a core set of questions that was developed by the author, see *appendix 1*. The core questions focused on the laundry process, logistical aspects of delivering and retrieving products, and motives for the potential M&A. Furthermore, the CEOs were asked to provide further clarification on answers that was considered insufficient and was also asked follow-up questions that arose during the

interview. The semi-structured interview method was chosen due to the flexibility it provides in terms of giving the opportunity to ask follow-up questions on the different subjects and the answers given by the interviewees, but it also provides a set of topics that was helpful for the author to be able to extract the data that was needed (Bryman & Bell, 2011). The interview guide was not sent to the respondents before the interview. Furthermore, both interviews were taped and everything that was said during the interview was transcribed afterwards.

Respondents	Interview Method	Interview Duration
CEO at Organization A	Face-to-face	75 minutes
CEO at Organization B	Face-to-face	60 minutes

Table 1. Interview respondents, interview method, and interview duration.

3.4 Research Quality

The research quality of the study is determined by the validity and reliability when collecting and assessing the data, in order to evaluate the results and potential replicability by other researchers (Collis & Hussey, 2014; Bryman & Bell, 2011). For qualitative research, there should be different criteria to be able to establish the quality of the research, and thus, they propose to use trustworthiness as an alternative to reliability and validity (Bryman & Bell, 2011). The trustworthiness has four different criteria that have an equivalent criterion in the qualitative research (ibid, p.395):

- Credibility (internal validity),
- Transferability (external validity),
- Dependability (reliability) and,
- Confirmability (objectivity/generalizability).

3.4.1 Credibility

To ensure the credibility of the study, a triangulation involving different sources and data collection methods have been used. Furthermore, the transcribed interviews were sent to each CEO respectively, in order for them to review what had been said and to ensure that there was no misunderstanding of the questions and the answers given. The triangulation and achievement of respondent validation are two methods suggested by Bryman & Bell (2011) as a way to increase the credibility of the study. It should be noted however, that the

researcher has to separate what the participants are able to comment and add, to be able to provide a more academic view than purely a business-related view (ibid). This was also considered by the author of this study.

3.4.2 Dependability

Through the methodology, the research process has been defined and elaborated on the research approach, the data collection methods, and the research process that was chosen in order to conduct this study. This was done to achieve a high degree of dependability, and as mentioned by Collis & Hussey (2014), the dependability of a study focuses on systematic and well documented research processes. Furthermore, ensuring a high degree of dependability will be of help to future researchers conducting a similar research process and to better understand the research process that this study conducted (Eriksson & Kovalainen, 2008).

3.4.3 Confirmability

The confirmability ensures that the researcher has acted in good faith and not overly allowed personal values or theoretical inclinations to clearly swing the research or the findings (Bryman & Bell, 2011). To ensure high confirmability in this study, the author have acted in good faith by not including personal values or inclinations to move the answers in one direction during the interviews. Furthermore, the data collected from the case organization involve actual data that represents the different demands for their products to help visualize the volumes that is both being produced and transported. In addition, this have been approved by the CEO at Org. A, which further ensures that the data included is not biased.

3.4.4 Transferability

The transferability of a study is related to the findings of the study and if it can be transferred and applied to other studies or situation to permit generalization (Collis & Hussey, 2014). As the qualitative research often investigate a small group or individuals that share similar characteristics, this makes it possible to create a database that could be used by other researchers to assert judgments and transferability to other context and different backgrounds (Bryman & Bell, 2011).

To assess high transferability of the study could be considered difficult. As it is a single case study, it is possible that the results of the study are only applicable to the organizations being investigated. Furthermore, it is possible that the findings are only applicable to the industrial laundry industry, and future researchers investigating the effects on other industries where

circulation products are used could find different results than this study. However, the two organization and the CEO's involved in this case study has been made anonymous as to better help reflect their viewpoint and make it possible for them to leave trustworthy answers (Bryman & Bell, 2011). Therefore, the two organization will be referred to Org. A and Org. B, while the CEO's will be referred to their respective organization (i.e. CEO at Org. A).

4. Empirical findings

The study used Org. A standpoint in the empirical findings, as they intend to move the production to Org. B. Furthermore, Org. A have over 20 different products they offer to their customers, however, to better help visualize the volumes and quantities being produced, transported, and moved throughout the two organizations, five products have been chosen to be used as examples. These five products are; pillow case, duvet-cover, regular size towel, small towel, and the bath mats.

4.1 Logistical aspects of Merger & Acquisition

4.1.1 Carriers, Truck size, and Driving hours

The carrier that is used by both organizations to deliver the products to the customers are the same (CEO Org. A; CEO Org. B). The carrier can be seen in *Figure 5* below. The dimensions of the carriers that the products are packaged on are the following; length: 62,5 centimeters, width: 82,5 centimeters, and height 158,5 centimeters (Heinex, 2018).

One of these carriers is able to hold 50 set, which translates to 50 of each product (bed sheet, pillow case, duvet-cover, towels, small towels, bath mat, bed sheets), this is how the products are being packaged and delivered to the customers (CEO Org. A). The carrier also stays at the customer until the next delivery, as it is used by the customer to throw the used laundry in (CEO Org. A). It is also possible to store only one type of product on them as well, which makes it possible to store the following quantities of each product on the carrier; either 1000 pillow cases, or 200 duvet covers. or 150 towels, or 500 small towels, or 500 bath mats. However, this is not how the products is transported to the customers.



Figure 5: The carrier being used today (Heinex, 2018).

The size of the truck that is going to be used to transport the products between the two destinations have the following dimensions; Length: 7,5 meters, Width: 2,5 meters, and Height: 2,1 meters (CEO Org. A). With the dimensions of the truck, together with the size of the carriers as described above, it will be possible to store 36 carriers in one truck. Org. A have also thought about purchasing slightly bigger carriers in order to be able to store more products on them. The dimensions of the slightly bigger carrier are the following: length: 80 centimeters, width: 70 centimeters, and height: 158 centimeters (CEO Org. A). The downside Org. A see with using the bigger carrier is that they are clumsier to deal with for the driver, and could possibly take up more space in the truck and result in less products being transported back from Org. B (CEO Org. A). However, as can be seen in *Table 2*, by using the slightly bigger carrier instead might result in more products being able to be transported between the two organizations.

Type of carrier	Length (cm)	Width (cm)	Truck Length (cm)	Truck Width (cm)	# of carriers
Current	62,5	82,5	750	250	36
New	80	70	750	250	33
# Of carriers = (Truck Length / Carrier length) x (Truck Width / Carrier Length)					

Table 2: Showing the number of carriers being able to be stored on one truck.

This will mean that there will be a difference of three carriers if Org. A chose to use the slightly bigger carrier instead. With the slightly bigger carrier, it will be possible to store roughly 33% more single article products, however, the customers do not want these carriers as they are clumsier to deal with (CEO Org. A). Therefore, the slightly bigger carrier could be used to only transport the products between the two organizations and re-package the products at Org. A.

Lastly, how long a driver in Sweden is allowed to operate a truck without break is regulated in Sweden, therefore, a driver can only drive for a maximum of four and a half hours before the driver has to take a break for at least 45 minutes (Transportstyrelsen, 2017). Furthermore, the drivers at Org. A works for eight-hours per working shift, with one hour of break, which makes the driver capable of driving eight-hours per working shift (CEO Org. A). The travel distance between Org. A and B is roughly 300 kilometers, which will take one driver three to three and a half hours to go one way. This implies that one trip to Org. B and back to Org. A

would take one driver almost their whole working shift to transport the products. In addition, according to the CEO at Org. A, the customers is located in an area of 200 kilometers from them, and the different routes extends from three hours to up to seven hours. This implies that the driver transporting the products between the two organizations can not also deliver the laundry to the customer during their working shift as the distance is too long.

4.1.2 Demand

As in many industries, there is peak-season and a low-season. The peak-season for Org. A is during the summer months; June, July, and August (CEO Org. A). The demand for the different products have been extracted from Org. A's, *figure 6*, and it is clear that there is a heavily increased demand during the summer months for the different products. The demand is almost increased by three times as much compared to the low-season. Lately, there has also been an increase of demand during the low-season when comparing the year of 2018 to 2017, *see appendix 6,7,8*. This increase of demand is both due to more customers being introduced to the organization, however, most of the demand is due to previous customers having more customers which in return increases the demand for Org. A's services.

Figure 6. Made anonymous

Figure 6: Comparison between the demand during the low-, peak-season, and the whole year of 2017.

Lastly, it is also mentioned by the CEO at Org. A that they are also dealing with smaller customers that manually count what products they have left, which can cause frequent rush-orders that the organization has to keep in mind, in order to fulfill a high service level towards the customers.

4.1.3 Current logistical flow

Org. A and Org. B deal with circulation products which shape the activities and processes they perform. It is different from traditional manufacturing organizations, due to them not having to retrieve the products from the customers at the same time as they deliver the new products. However, as mentioned in *2.3.1 Reverse logistics*, this has changed due to the introduction of reverse logistics (De Brito & Dekker, 2004; Kleber, 2006), but the manufacturing organizations will still be different from organizations in the industrial laundry industry. The different process steps of the industrial laundry can be seen in the *figure 7* below.

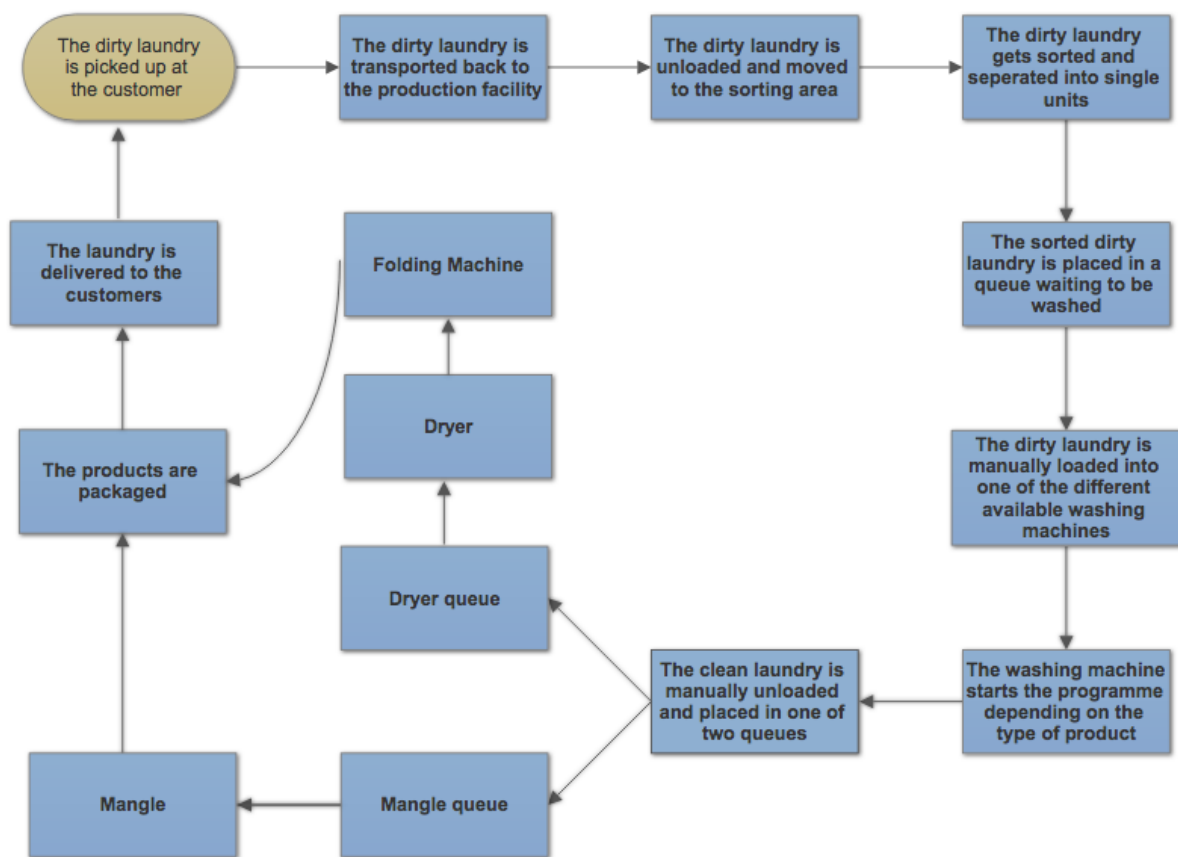


Figure 7: Chart over the different processes involved in delivering and retrieving the products to and from the customers for Org. A.

These types of processes relate more to the logistical flow system that can be seen in *figure 3* and will, therefore, be different from the traditional logistics flow seen in *figure 2*. As the retrieving and delivering process happens simultaneously, as the clean laundry is swapped with the used laundry, and the used laundry is then transported back to the production facility where the process continues.

4.2 Motives to engage in Merger & Acquisition

4.2.1 Organization A

The reason to engage in M&A between Org. A and Org. B is mainly due to capacity increase and cost-efficiency motives according to the CEO at Org. A. Furthermore, Org. B have capacity available for both of the organizations to produce and handle the number of products needed, while operating eight-hours per day for five days a week (CEO Org. B). It is also possible to expand the working hours for future capacity demand. In addition, Org. A saw a need to purchase new production equipment to be able to satisfy future customers demand, and came across Org. B that had excess capacity that was not utilized and decided that a

merger could be the best solution instead of purchasing new production equipment (CEO Org. A). This merger will give Org. A access to new production equipment that is more automated, which will also reduce the costs in production and better quality assure the products and reduce the amount of downtime in production (CEO Org. A). The automatization will also remove the manual loading and unloading process that exists with the regular washing machines (CEO Org. A).

The M&A will also give Org. A the ability to enter a new regional market that was previously untouched and will reduce the time of entry into that market (CEO Org. A). Furthermore, it will also give Org. A the ability to deliver to potential customers that have hotels, health spas, and hostels in regions closer to Org. B that Org. A had to decline before as there was few customers located closely to make it financially feasible for them (CEO Org. A).

It is expressed by the CEO at Org. A that they see many benefits with this M&A, however, there is also concerns regarding the travel distance and how to manage the inventory which can cause challenges with this M&A. In addition, the relocation of the production facility will also increase the time the laundry is in transit from what it is today for Org. A, see *appendix 2*.

4.2.2 Capacity increase

The theoretical production capacity at Org A is circa 6300 kilos per eight-hour working shifts, or circa 800 kilos per hour, see *Appendix 3*. The actual production capacity at Org. A is different depending on the low- and peak-season according to the CEO at Org. A. The actual production capacity during low-season is around two to two and a half tonnes per eight-hour working shift, which would imply that there is only about a 33-40% utilization rate of the theoretical production capacity that the washing machines can produce. During peak-season, the actual production capacity is around four tonnes per eight-hour working shift, which is about 66% utilization rate of the washing machines. The low utilization rate is mainly due to two reasons according to the CEO at Org. A; during the low-season there is often a low amount of single article products (only duvet covers for example) needed to be washed, which lead to the machines not being completely filled with products. The second reason for the low utilization rate is the unloading and loading process which takes a lot of time as it is done manually (CEO Org. A). During peak-season, there is a lot of single article products that needs to be washed, however, as with the low-season, there is a lot of manual labor being

performed in the unloading and loading process explained by the CEO at Org. A, which cause the machines to not run at full capacity.

If this M&A were to take place, the production equipment that currently exists at Org. B is theoretically able to produce eleven tonnes per eight-hour working shifts, which equals to 1375 kilo/h (CEO Org. B). This increase in capacity is only with the tunnel washer included and no other washing machines, see *appendix 4 & 5* for a visualization of the difference in regular washing machines and a tunnel washer. The tunnel washer located at Org. B almost doubles the theoretical production capacity that Org. A is able to produce, while the actual utilization rate is almost as low as for Org. A. The utilization rate of the tunnel washer at Org. B is slightly above 50%, and the actual produced capacity is about six tonnes per eight-hour day. The CEO at Org. B explains that the reason for the excess capacity is that when it was purchased, the intention was to prepare for the future if there was ever the demand for it, and as there is close to little manual labor being performed, the washing tunnel can produce a lot faster without downtime, causing a low utilization rate even though the demand has increased. Furthermore, the CEO at Org. B add that there is slightly no difference during the peak-seasons for them either, as their customer base is located close to a big city in Sweden where it is a high demand for their customers' services all year around, which in return, increases the demand for Org. B's services.

4.3 Summary of the findings

As the findings show, the organization is looking at a few logistical problems with this M&A. During the case study, only five products were included to better help visualize the process and volumes, however, the organization have over 20 different products that is in need to be transported back and forth between the two organizations. This creates logistical problems in terms of the packaging of products on the carriers and the requirement to fulfill the demand that is requested from the customers. Furthermore, the difference of demand in the peak-season compared to the low-season is also a factor that needs to be considered.

It is expressed by the CEO at Org. A, there is also a possibility that customers place rush-orders, which the organization has to fulfill in order to achieve a high service level. These rush-orders is not something the industrial laundry can completely forecast in advance; therefore, it will create issues regarding the accessibility of products for Org. A as the production facility is relocated and the travel distance for the used laundry is increased.

Lastly, the intent of this M&A is to gain access to new production equipment which in return will also increase the production capacity for Org. A. This will help them to meet future demand of their customers. The new production equipment will also reduce the costs as it will be more automated, and more automatization will imply less manual labor which in return will increase the production output. However, as Org. A see and describe many benefits of this potential merger, there is concerns that comes with the M&A as well, especially considering the travel distance between the two organizations and the inventory management as mentioned by the CEO at Org. A.

5. Discussion and Analysis

5.1 Logistical aspects of Merger & Acquisition

5.1.1 Time and distance of transportation

As mentioned in *4.1.1 Carriers, truck size, and driving hours*, the driver is allowed to drive for four and a half hours before a mandatory break of at least 45 minutes is needed. The drivers at Org. A work for eight-hours per working shift, and the distance between Org. A and Org. B is roughly 300 kilometers. If the driver starts at Org A., a break is needed around the time Org. B is reached or slightly after the driver has left to go back to Org. A. After traveling between the two organizations, the driver would then have approximately one hour left of the working shift to deliver the products to the customers. However, as there is an unloading and loading process done by the driver, *figure 7*, this hour is going to be allocated to this process. Furthermore, as Org. A have their customer base spread in an area of 200 kilometers from their current production facility and depending on the length of the route, see *4.1.1 Carriers, truck size, and driving hours*, it will take the driver more time than what is left of the working shift. Therefore, one trip between the two organizations will take the driver the whole working shift to complete, and there will not be any time left to deliver the products to the customers. This will mean that as the organization works with circulation products, meaning that what has been previously delivered and used by the customers' needs to be taken back, and together with the travel distance being long and time-consuming for the drivers, Org. A will have to consider how to best store the products before they reach the production facility.

5.1.2 Warehousing

The centralized warehouse model has the benefit of being more efficient in terms of inventory management and will also require less inventory to achieve a higher service level towards the customers (Das & Tyagi, 1997; Abrahamsson, 1992; Çelebi, 2015). The drawbacks, however, is related to the transportation distance that is required to meet the end customer (*ibid*). The decentralized warehouses have the benefits of better availability of inventory for the customers and lower cost of transportation between the warehouse and customer as the filling rate of trucks is higher between the warehouses (Das & Tyagi, 1997). The drawbacks, however, is that to achieve a high service level towards the customers, the

decentralized warehouses require more inventory compared to the centralized model (Abrahamsson, 1992; Çelebi, 2015; Das & Tyagi, 1997).

In regard to what has been written in *5.1.1 Time and distance of the transportation*, it is evident that the time spent to reach Org. A's customers, but also the time and distance needed to travel between the production facility at Org. B from Org. A, will make the use of only a centralized warehouse unfit. The benefits of using a centralized warehouse as proposed by Abrahamsson (1992) and Das & Tyagi (1997), could be more suited towards the regular manufacturing organization which do not recycle or reuse their products in the production. In addition, Das & Tyagi (1997) also mention that the use of a centralized warehouse might not be suitable if the distance needed to be travelled to the customer is large. It is possible that Das & Tyagi (1997) might refer to organizations operating in two different geographical markets in two different countries, however, this could also be true for organizations operating in the industries where circulation products is used. To add to that, Das & Tyagi (1997) also investigated when an organization should use either a centralized or decentralized warehouse model and found that;

- If the organization distribute their own products, a decentralized warehouse model should be used.
- The longer the travel distance and transportation costs, the more it favors a decentralized warehouse model.

As Org. A do distribute their own products and the travel distance could be considered long, a decentralized warehouse model is favored. It has also been mentioned previously that there is not enough time for a driver to transport the products between the two organizations and then to the customers of Org. A in one working shift. At first glance, it is evident that this M&A require a decentralized warehouse, as there are not enough working hours for the drivers to do the transportation between the two organizations and out to the customers. Furthermore, as the decentralized warehouse model requires more inventory to reach a higher service level will be true for Org. A. This is mostly due to the production facility being moved, which will require more inventory being kept at Org. A to be able to satisfy the demand from the customers.

5.1.3 Choice of Carrier

The decision on what carrier to use to transport the products between Org. A and Org. B has both benefits and drawbacks. As seen in *Table 2* there would only be a difference of three

carriers, depending on if the organization would use the regular or the slightly bigger carrier. However, if Org. A would chose to use the slightly bigger carrier, the number of products being transported between the two organization could be fewer than only using the regular carrier, even though it is possible to carry more products per carrier. The reason for this is that the regular carrier is also used to deliver the products to the customer, meaning that if they would use the slightly bigger carrier, it would require a combination of both carriers to be transported between the two organizations. Furthermore, if one truck is transported completely full with used laundry on the regular carrier to Org. B, meaning 36 carriers, an equal number of carriers will be required to be delivered back to Org. A. This would require planning and optimizing the packaging of the different carriers to be sure that there is enough clean products transported back from Org. B to A. Furthermore, if it is possible to optimize how to package the clean products, the problem of not having enough carriers to the customers becomes evident. This could be dealt with by storing the regular carriers at the decentralized warehouse and use the slightly bigger carrier to transport the used products to the production facility, however, this would add an extra process step in the logistics flow as the personnel at Org. A would need to unload the used laundry the customers have thrown in the regular carrier and re-package it unto the slightly bigger carrier.

To implement the slightly bigger carrier will be problematic, as it might increase the transportation times between the two organizations more than necessary, due to the risk of not having enough regular carriers for Org. A's customers. However, it could be beneficial to implement the bigger carriers if the customers for both organizations would accept the slightly bigger carrier and this is the only carrier to be used.

5.1.4 Increase of process steps

As one carrier is able to hold 50 set, and the customer requires this kind of packaging of the carrier, there is two possible ways the products can be delivered to Org. A; It is possible to either package the products for Org. A's customers directly at Org. B, or, package the carriers on single article products to maximize the amount of products able to be packaged on one carrier. The latter will imply that there will be another process-step in need of being added, which is repackaging the products once they reach Org. B. Furthermore, this could mean that the amount of products being stored at Org. A to repackage the products needs to be higher, to be able to have time to do this process step than simply doing all of the packaging at Org.

B. To package all of the products for Org. A's customers at Org. B might increase the amount of transportation between the two organizations.

As there is enough capacity at Org. B to satisfy the capacity need for both organization and the relocation will also increase the utilization rate of the tunnel washer. Therefore, this will not be a logistical problem for the organizations, rather, the inventory management and different packaging processes could cause problems for the organizations.

5.2 Inventory management

Jacobs & Chase (2015) mention several reasons to keep inventory and also expresses the importance of deciding whether to have excess or insufficient inventory in relation to future demand. It is also possible to adjust the amount of inventory depending on the peak- or low-season through the anticipation inventory (Silver et al., 1998). The demand during the peak-season is increased by three times compared to the low-season for Org. A, and to ensure that there is enough products available for both organizations during the peak-season could be problematic.

The increased travel time for the laundry products will also increase the number of products in transit from what it has been previously, *appendix 2*. In addition, as the products is waiting to be retrieved at the customer, and the travel time and distance to the production facility is increased, could possibly lead to a shortage of products for both organizations. Furthermore, to ensure that there will be a high service level toward the customers, the organization has two alternatives; either to secure a sufficient inventory level at Org. A or to increase the number of times one truck is going to travel between Org. A and B.

5.2.1 Increasing the inventory levels

As both organizations own the products, and the customer pay per use, making sure that the customers will receive the products is of essence, otherwise it will lead to shortage costs (Jacobs & Chase, 2015). If a decentralized warehouse model would be used, ensuring that there is sufficient inventory at Org. A to cover all of the customer orders, will increase the overall inventory levels at the organization (Abrahamsson, 1992). This is due to the increased travel distance and travel time to reach the production facility. The increase of inventory levels would reduce the risk of acquiring shortage of products at Org. A, however, it is possible that this will move the risk to Org. B. If the material flow and inventory is not optimized, it is possible that the organization would acquire penalties in terms of increased

costs or unsatisfied customers (De Brito & Dekker, 2004; Tibben-Lembke & Rogers, 2002; Kleber, 2006). This will be further problematic during the peak-season, as the demand for the products is increased by three times compared to the low-season, which will lead to more material flow between the two organizations, and the risk of acquiring shortage of products for both organizations could be increased. The organization could purchase more products to be able to satisfy the demand from all of the customers with ease. However, this could be ineffective as the amount of capital invested in inventory will be large, and as mentioned by Jacobs & Chase (2015), having too much inventory is costly and will be seen as money sitting on the shelf during the low-season when it is not used.

5.2.2 increasing the number of transportations

In this M&A there will be a large number of products in the pipeline inventory (in transit) due to the increased travel distance and travel time. If the organization would increase the amount of deliveries to be made between the decentralized warehouse and the production facility, the pipeline inventory will be reduced. The drawbacks of increasing the number of deliveries between the two organizations will be a low utilization of the space in the truck, as there is a chance that there might not be enough products waiting to be delivered to the production facility. This could be further enhanced during the low-season, while during the peak-season, this could be lesser problem.

It has been noted by scholars that reverse logistics add complexity and complications to the logistical activities for traditional manufacturing organizations (De Brito & Dekker, 2004; Kleber, 2006), organizations working with only circulation products might have solutions and processes that could better handle the complexity and complications of the logistics flow, for example the likes of industrial laundries. However, when the production facility is moved to a geographical distant area, it is evident that the reverse logistics will be troublesome for them as well.

5.2.3 Summary of logistical problems

During *5.1 Logistical aspects of M&A*, it has been revealed that the logistical problems caused by the relocation will be the distance and the time to travel between the two organizations. As the transportation of the products between the organizations will take the whole working shift for a driver, there will be a need of a warehouse closer to the customers of Org. A. Furthermore, as there are circulation products involved, the products retrieved from the customers will also have to be stored before being transported to the production

facility located at Org. B. Lastly, the choice of carrier can become problematic due to either an increase of process steps required, or an increase of transportations needed to be made between the two organizations.

During 5.2 *Inventory management and inventory levels*, there has been a discussion regarding the problems regarding inventory management and inventory levels related to the desired service level. Furthermore, the peak-season will contribute to a great increase of demand for the products that is being offered, which will also cause problems regarding the availability of the products for both organizations. In addition, the increased travel time for the laundry also contribute to the logistical problems and needs to be considered. Lastly, the increase of products in transit could result in shortage of products for both organizations and if the material flow between the two organizations is not optimized, there is a possibility that Org. A could receive penalties in terms of increased costs or customer dissatisfaction.

5.3 Motives to engage in Merger & Acquisition

Organizations engage in M&A due to different motives, examples include growth, new market entry, synergies, but the main theme is that the M&A should create value for the organization (Gaughan, 2011; McCarthy & Dolfsma, 2012; Nahavandi & Malekzadeh, 1988). The different motives can either be value-increasing, and become successful in creating value for the organization, or become value-destroying, and create no value for the organization (McCarthy & Dolfsma, 2012).

Darkow et al. (2008) found that M&A's which purpose was to strengthen the logistical activities for an organization generally created value and thus, could be considered successful. For Org A., the motives were not to strengthen the current logistical activities of the organization, but rather to gain access to new production equipment and to prepare for future demand as expressed by the CEO at Org. A. In addition, the move of the production facility is done to achieve economies of scale and to acquire cost savings. The move of the production facility from Org. A to Org. B will, however, entail longer distance traveled for the laundry. It is possible that the added logistical activities could destroy some of the value the M&A was intended to create through creating a trade-off between economies of scale versus the increase of transportation and inventory management activities. It is possible that only focusing on the benefits of economies of scale and new production equipment could deny value creation as it is possible that it could only maximize one function, as mentioned by McCarthy & Dolfsma (2012). Org. A also agree that engaging in this M&A will give them

an opportunity to break into a new geographical market that would otherwise require high capital investment and have a high barrier of entry in terms of investment. Furthermore, it is now also possible to accept customers closer to Org. B that Org. A previously had to decline. These motives behind the M&A align well with what previous scholars have written (Gaughan, 2011; McCarthy & Dolfsma, 2012; Nahavandi & Malekzadeh, 1988).

The horizontal merger between Org. A and Org. B could lead to high integration costs, which is common in M&A as expressed by Darkow et al. (2008). The integration costs between the two organizations have not been investigated in this study, however, the integration of the logistical activities is something that needs to be considered. Darkow et al. (2008) also mention that the travel distance could deny the potential value creation behind M&A, and as there is 300 kilometers of travel distance between the two organizations together with extended time of travel for the laundry products, it could be true for these organizations. It is possible that Darkow et al. (2008) refers to long travel distance across country borders, however, the situation for organizations using circulation products, where they also need to retrieve the products and transport them back to the production facility, could also destroy potential value to be created even if the travel is done within the same country.

6. Conclusion and future research

6.1 Logistical problems related to Merger & Acquisition

As the products the industrial laundry offers is circulation products, there will be an increase of logistical activities that has to be considered in this M&A. The distance between the two organizations is roughly 300 kilometers and together with the processes the driver has to perform, transporting the products between the two organization will require the whole working shift of the driver. Due to the operating hours set by Transportstyrelsen, together with the driving distance and working hours of the driver, this will create logistical problems in terms of warehousing. The choice of using either a centralized or decentralized warehouse model could be decided on the criteria's given by Das & Tyagi and through these criteria's, the decentralized warehouse model is seen as appropriate to use if this M&A would take place. However, this will require increased inventory levels to maintain a high service level towards the customers.

The need for increased inventory levels at Org. A could create problems related to shortage of products for both organizations. Due to the travel distance and laundry travel time, the pipeline inventory will be much higher than it has previously been for both organizations. This extra travel time will be further enhanced during the peak-season, when there is a high demand for the products. This will require a consideration from the organization regarding how the inventory management should be managed, but also, how to optimize the material flow between the two organizations.

6.2 Suggestions to the logistical problems

The increase of laundry travel time will incline a need for more inventory to be kept at Org. A to maintain a high service level towards the customers. However, this could be a short-sighted approach as the amount of inventory will be high during the low-season and the pipeline inventory will be similar. Therefore, a possible solution would be to increase the number of deliveries between the two organizations. This would decrease the pipeline inventory, as the laundry will reach the production facility faster, and this would also decrease the need for high inventory levels at Org. A. Furthermore, this would also imply that there should be as low inventory as possible at Org. A and all the packaging of the products for Org. A's customers should be done at the production facility at Org. B. The inventory to be kept at Org. A should be the safety inventory and should be used to fulfil the rush orders

that occur. The drawbacks, however, is related to the filling rate of the trucks as it will be lower. This might not be the case during the peak-seasons as there is such a high demand for the products, while during the low-season it might be true.

To conclude, it might not be suitable to use a decentralized warehouse as this will increase the inventory levels that will be unused during the low-season, but rather to use a decentralized distribution point instead where the goods are unloaded and directly prepared to be delivered, instead of being stored.

6.3 Motives to engage in Merger & Acquisition

The different motives for organizations to engage in M&A has been well documented by previous scholars. New market entry, growth, creating sustainable competitive advantages, and value creation is the main themes that are associated to why organizations engage in M&A. There are also two types of theories related to M&A; the value-increasing and value-destroying theories. The value-increasing theory state that the only reason to engage in M&A is if it creates value. This can be done either through creating synergies, increasing the efficiency, or obtain lower costs through economies of scale. In contrary to the value-increasing theory of M&A, the value-destroying theory focuses on when the organizations fail to create value through, for example, only being able to maximize one function of the organization.

The motives of the investigated organization as to why engage in M&A was similar to what previous scholars have found. There was, however, some differences. One of the motives for the organization, and primarily the most important one, was to gain access to new production equipment that would increase the production capacity. Previous scholars have not taken into consideration the motives related to increasing the production output or gaining access to new and better production equipment, and could thus, be one more motive as to why SMEs engage in M&A. If this motive is isolated to SMEs in the industrial laundry industry could be questioned and is left for future research. This M&A will also increase the logistical activities related to transportation and inventory management, which could deny the value creation if not considered.

6.4 Future research

As the introduction of reverse logistics and the complexity it brings to the logistical flow system, it would be interesting to continue the research around logistical activities, circulation

products, and Merger & Acquisition. This study has only focused on the material flow that will occur between organizations, thus, it would be interesting to see if the cash-flow between organization would encounter any further difficulties or make the suggestions provided invalid. Furthermore, the information flow could also be another topic that could bring interesting results.

It was also noted that the motive for Organization A to engage in the M&A aligned well with what previous scholars have said is possible motives behind M&A, however, it was also revealed that access to new production equipment was one motive for Org. A. If this is isolated to only the investigated organization, or if this is more common with SMEs would also be an interesting topic to do further research on.

The investigated organization was in the pre-merger phase, and thus, the logistical problems and risks identified could only be the tip of the iceberg. Therefore, it would be interesting to investigate the outcome of the M&A and the logistical problems that was identified after the M&A occurred, as it could be different than those identified in the pre-merger phase.

References

- Abrahamsson, M., (1992). *Tidsstyrd Direktdistribution: Drivkrafter och logistiska konkurrensfördelar med Centrallagring av producentvaror*. Sweden, Studentlitteratur Lund.
- Aguilera, R. V., & Dencker, J. C. (2004). *The role of human resource management in cross-border mergers and acquisitions*. *The International Journal of Human Resource Management*, 15(8), 1355-1370.
- Alston, P. (2002). *Resisting the merger and acquisition of human rights by trade law: a reply to Petersmann*. *European Journal of International Law*, 13(4), 815-844.
- Bryman, A., & Bell, E. (2011). *Business research methods*. 3rd edition. Oxford University Press, USA.
- Capron, L. (1999). *The long-term performance of horizontal acquisitions*. *Strategic management journal*, 987-1018.
- Caputo, M., & Mininno, V. (1996). *Internal, vertical and horizontal logistics integration in Italian grocery distribution*. *International Journal of Physical Distribution & Logistics Management*, 26(9), 64-90.
- Cartwright, S., & Schoenberg, R. (2006). *Thirty years of mergers and acquisitions research: Recent advances and future opportunities*. *British journal of management*, 17(S1).
- Chatterjee, S. (1986). *Types of synergy and economic value: The impact of acquisitions on merging and rival firms*. *Strategic management journal*, 7(2), 119-139.
- Çelebi, D. (2015). *Inventory control in a centralized distribution network using genetic algorithms: A case study*. *Computers & Industrial Engineering*, 87, 532-539.
- Christopher, M. (2011). *Logistics & supply chain management* (4.th ed.). Harlow: Financial Times Prentice Hall.
- Collis, J. and Hussey, R. (2014). *Business research -a practical guide for undergraduate and postgraduate students*. 4th ed. Basingstoke, Hampshire: Palgrave Macmillan.
- Cording, M., Christmann, P., & Bourgeois Iii, L. J. (2002). *A focus on resources in M&A success: a literature review and research agenda to resolve two paradoxes*. *Academy of Management*, 12(8), 1-40.
- Darkow, I. L., Kaup, C., & Schiereck, D. (2008). *Determinants of Merger & Acquisition success in global logistics*. *International Journal of Logistics: Research and Applications*, 11(5), 333-345.
- Das, C., & Tyagi, R. (1997). *Role of inventory and transportation costs in determining the optimal degree of centralization*. *Transportation Research Part E: Logistics and Transportation Review*, 33(3), 171-179.
- De Brito, M. P., & Dekker, R. (2004). *A framework for reverse logistics*. In *Reverse logistics* (pp. 3-27). Springer Berlin Heidelberg.
- Elsass, P. M., & Veiga, J. F. (1994). *Acculturation in acquired organizations: A force-field perspective*. *Human Relations*, 47(4), 431-453.

- Eriksson, P., & Kovalainen, A. (2008) *Qualitative methods in business research*. London: Sage Publications.
- European Union Commission. (2003). *Commission recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises*. Official Journal of the European Union, 46, 36-41.
- Farquhar, J. (2012). *Case study research for business*. Los Angeles, [Calif.] ; London: SAGE.
- Gassin, T. Al-Iryani, N. (2005). *Deciding a Distribution Network Design: Varying from Centralized to Decentralized Pattern - The case of Mölnlycke Health Care AB towards east European market*.
- Gaughan, P. (2011). *Mergers, acquisitions, and corporate restructurings* (5.th ed.). Hoboken: Wiley.
- Grajek, M., Gugler, K. P., Kretschmer, T., & Miscisin, I. (2017). *Static or dynamic efficiency: Horizontal merger effects in the wireless telecommunications industry*.
- Harrison, J. S., Hitt, M. A., Hoskisson, R. E., & Ireland, R. D. (1991). *Synergies and post-acquisition performance: Differences versus similarities in resource allocations*. Journal of management, 17(1), 173-190.
- Heinex. (2018). *Rulltainer FLEX med 2 hyllor/grindar - Heinex*. [online] Available at: <http://www.heinex.se/produkt/vagnar/rullcontainer/rullcontainer-flex-2018-heinex-original.aspx> [Accessed 3 Apr. 2018].
- Hoberg, G., & Phillips, G. (2010). *Product market synergies and competition in mergers and acquisitions: A text-based analysis*. The Review of Financial Studies, 23(10), 3773-3811.
- Häkkinen, L., Norrman, A., Hilmola, O. P., & Ojala, L. (2004). *Logistics integration in horizontal mergers and acquisitions*. The International Journal of Logistics Management, 15(1), 27-42.
- Institute for Mergers, Acquisitions and Alliances (IMAA). (2018a) *M&A Statistics - Worldwide, Regions, Industries & Countries*. [online] Available at: <https://imaa-institute.org/mergers-and-acquisitions-statistics/> [Accessed 21 Mar. 2018].
- Institute for Mergers, Acquisitions and Alliances (IMAA). (2018b). *M&A Statistics by Countries*. [online] Available at: <https://imaa-institute.org/m-and-a-statistics-countries/> [Accessed 21 Mar. 2018].
- Jensen Group. (2018). *Senking Universal*. [online] Available at: <https://www.jensen-group.com/products/product-detail/senking-universal.html> [Accessed 27 April. 2018]
- Kleber, R. (2006). *Dynamic Inventory Management in Reverse Logistics*. [New York]: Springer-Verlag Berlin Heidelberg.
- Jacobs, R., & Chase, R. (2015). *Operations and supply chain management*. New York: McGraw-Hill Higher Education.
- Laundry Ledger. (2018). *Continental Girbau's E-Series Washers Help 'Green' Laundries*. [online] Available at: <http://laundryledger.com/continental-girbaus-e-series-washers-help-green-laundries> [Accessed 27 April. 2018]

- Lumsden, K. (2007). *Fundamentals of logistics. Compendium, Department of transportation and logistics*, Chalmers University of Technology.
- McCarthy, K. J., & Dolfsma, W. (2012). *Understanding mergers and acquisitions in the 21st century: A multidisciplinary approach*. Palgrave Macmillan.
- Moeller, S. B., Schlingemann, F. P., & Stulz, R. M. (2004). *Firm size and the gains from acquisitions*. *Journal of financial economics*, 73(2), 201-228.
- Morgan, T. R., Richey Jr, R. G., & Autry, C. W. (2016). *Developing a reverse logistics competency: The influence of collaboration and information technology*. *International Journal of Physical Distribution & Logistics Management*, 46(3), 293-315.
- Nagurney, A. (2009). *A system-optimization perspective for supply chain network integration: The horizontal merger case*. *Transportation Research Part E: Logistics and Transportation Review*, 45(1), 1-15.
- Nahavandi, A., & Malekzadeh, A. R. (1988). *Acculturation in mergers and acquisitions*. *Academy of management review*, 13(1), 79-90.
- Schmitt, A. J., Sun, S. A., Snyder, L. V., & Shen, Z. J. M. (2015). *Centralization versus decentralization: Risk pooling, risk diversification, and supply chain disruptions*. *Omega*, 52, 201-212.
- Schuler, R. S., Tarique, I., & Jackson, S. E. (2004). *Managing human resources in cross-border alliances*. In *Advances in mergers and acquisitions* (pp. 103-129). Emerald Group Publishing Limited.
- Schweiger, D. M., & Weber, Y. (1989). *Strategies for Managing Human Resources During Mergers and acquisition*. *People and Strategy*, 12(2), 69.
- Shaver, J. M. (2006). *A paradox of synergy: Contagion and capacity effects in mergers and acquisitions*. *Academy of Management Review*, 31(4), 962-976.
- Shleifer, A., & Vishny, R. W. (2003). *Stock market driven acquisitions*. *Journal of financial Economics*, 70(3), 295-311.
- Silver, E. A., Pyke, D. F., & Peterson, R. (1998). *Inventory management and production planning and scheduling (Vol. 3, p. 30)*. New York: Wiley.
- Storey, D. J. (2016). *Understanding the small business sector*. Routledge.
- Sudarsanam, P. S. (1995). *The essence of mergers and acquisitions*. Pearson PTR.
- Tibben-Lembke, R. S., & Rogers, D. S. (2002). *Differences between forward and reverse logistics in a retail environment*. *Supply Chain Management: An International Journal*, 7(5), 271-282.
- Transportstyrelsen. (2017). *Kör- och vilotider - regler och vägledning*. [online] Available at: https://www.transportstyrelsen.se/globalassets/global/publikationer/vag/yrkestrafik/produkter/kor-och-vilotider_utgava14_webb_2017-09-20.pdf [Accessed 17 April. 2018].
- Travlos, N. G. (1987). *Corporate takeover bids, methods of payment, and bidding firms' stock returns*. *The Journal of Finance*, 42(4), 943-963.

Vogt, J. J., Pienaar, WJ. & De Wit, P. W. C. (2002). *Business logistics management: Theory and practice*. Oxford University Press, USA.

Wiengarten, F., Pagell, M., Ahmed, M. U., & Gimenez, C. (2014). *Do a country's logistical capabilities moderate the external integration performance relationship?*. *Journal of Operations Management*, 32(1-2), 51-63.

Zhou, G., Yang, Y., & Cao, J. (2012). *Competition and integration in closed-loop supply chain network with variational inequality*. *Mathematical Problems in Engineering*, 2012.

Appendix 1. Interview guide

Questions to be asked to both organizations;

1. Describe the company and the different production processes.
2. Describe the delivery and retrieving process.
3. What are the theoretical production capacity in tonnes produced with your current production equipment?
4. How much is the actual production capacity in tonnes on average?
5. How are the products being packaged today?
 - Follow-up question added during the interview: What are the size and dimensions of the carriers that you use to package the products on?
 - Follow-up question added during the interview: How many of each type of product can be packaged on these carriers?
6. What are the weekly demand on average for the different articles you use? (towels, duvet covers, etc.)?
7. How often are you delivering products to your customers?

Questions to be asked for Organization A;

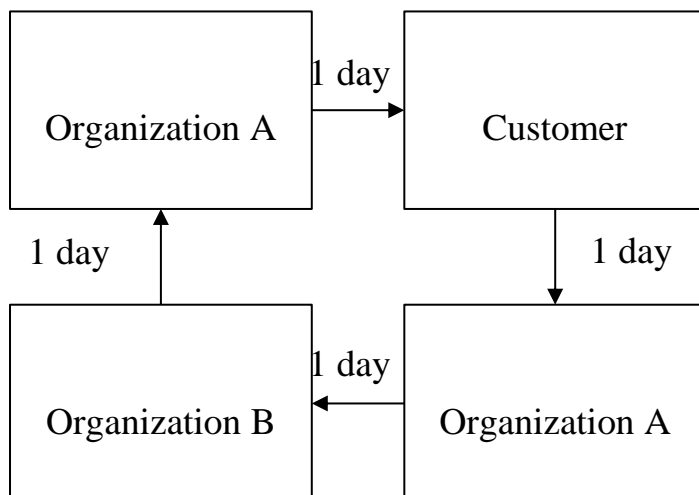
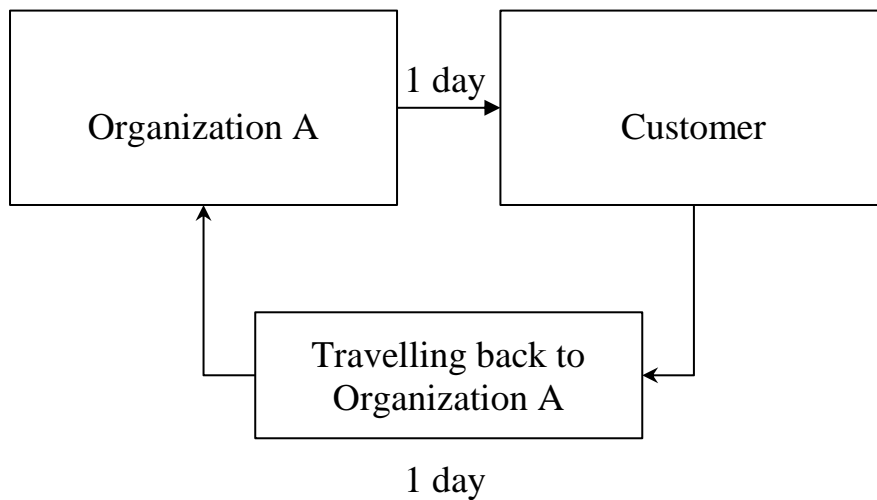
1. What are the motives behind this M&A?
2. Do you see any possible challenges with this M&A?
3. How are you planning the transportation between the organizations?

Follow-up question added during the interview: What are the size of the truck that is supposed to travel between the two organizations?
4. How often do you plan on sending the products back and forth between the two organizations?

Appendix 2. Increased travel time for the laundry

The two pictures below show the time a single laundry product will be travelling from the production facility to the customer and back to the production facility. The first picture show Org. A, and how it is today, while the second picture show how it will be with the M&A. It is also important to note that the time the laundry is in need of being washed is longer depending on how frequent the organization delivers to the customer. Thus, the time the laundry is in transit is actually longer than what is shown below.

The used laundry will be retrieved from the customers to the warehouse located at Org. A, and the products will then be transported to the production facility located at Org. B where it will go through the cleaning and packaging process and wait to be transported back to Org. A, and lastly, the products will be transported to Org. A and then to the customers of Org. A.



Appendix 3. Theoretical production capacity

Appendix 3. Made anonymous.

Appendix 5. Difference between the washing machines cont.

In contrary to the tunnel washer, the regular washing machine requires only manual unloading and loading processes. Picture used to visualize is borrowed from Laundry Ledger (2018).



Appendix 6. Demand visualization

Appendix 6. Made anonymous.

Appendix 7. Demand visualization cont.

Appendix 7. Made anonymous.

Appendix 8. Demand visualization cont.

Appendix 8. Made anonymous.