Business Administration, Business Process & Supply Chain Management,

Degree Project, 30 credits

Sustainable Last Mile Logistics in Urban Food Retail

Case of Axfood, a Swedish Food Retailer

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Academic term: Spring 2017
Subject: Business Process & Supply Chain Management,
Degree Project
Level: Master 30 ECTS credits
Course code: 5FE04E
Abstract

**Purpose:** The increasing importance given to sustainability issues by governments, companies, consumers, suppliers, researchers, students and the authors of this paper in addition to the scarce empirical studies on the topic of sustainable last mile logistics operations in the food retail industry in Sweden provides relevance to the choice of topic. This paper presents an exploratory single-case study on a Swedish food retailer with a strong sustainability-oriented decision-making body, and will seek to understand how they manage to adopt best sustainable practices and which drivers and most responsible for it.

**Objective:** The aim of this study is to present through an empirical study, how food retailers operate their last mile logistics operations according to the triple bottom line approach, contributing to this young field where a profusion of data to confirm the existing theory remains deficient. Furthermore, the focus is placed on the different drivers for food retailers to adopt sustainable practices in their transportation operations from the distribution warehouse to their stores located in urban areas.

**Approach:** A Swedish food retailer that strives for best practices will be studied in order to obtain key empirical data, which will allow the authors to compare theory and empirical data. The study will focus on the sustainability-oriented operations approach in the Last Mile Logistics of the chosen retailer and observe the different drivers regarding their operations following all aspects of the triple bottom line. A single-case study analysis of a leading company in terms of sustainability-driven operations will provide more insight on how this “category” of food retailers manages to operationalize their environmental-friendly culture and strategy for inbound Last Mile Logistics successfully, without losing their competitive edge and remaining economically sustainable.

**Findings:** After juxtaposing the secondary data issued from the existing theories on sustainable LML in the food retail industry to the primary data obtained from Axfood, a Swedish food retailer, the results have demonstrated that a business cannot neglect economic drivers to be financially sustainable, (cost optimization,
enhanced efficiency, etc.) it remains important and cannot be overridden to enable a shift towards optimal sustainability practices in LML operations. However, the drivers that have proven to make the cut in order to succeed in achieving best sustainable practices are; a highly proactive management, stakeholder pressure (particularly consumers and NGOs amongst others) and innovative technology (including those that imply a short-term economic trade-off for long-term greater good to the TBL dimensions).

**Keywords:** Sustainability; Sustainable practices; Last Mile Logistics; Sustainable Last Mile Logistics; Triple Bottom Line; Food Retailers; Food Retail Industry; Drivers.
Acknowledgments

Carrying out this Master Degree thesis project was undeniably a highly valuable experience. It has given us the opportunity to apply the knowledge and experience gained over the past academic year in Business Process and Supply Chain Management but also that gained at the Ecole de Management de Normandie and other international experiences in Asia and South America. We express immense gratitude to our professor and examiner, Professor Helena Forslund for her implication, dedication and guidance and contribution to our progression throughout this academic year. We are greatly thankful to our project tutor, Mr. Peter Berling, who has guided and continuously provided us with feedback and support during our degree project. Finally, we express immense gratitude to the Axfood Company and particularly Åsa Domeij, Head of Environment and Social Responsibility for dedicating their precious time, allowing us to obtain highly valuable information necessary to the completion of this project. Moreover, we would like to thank our fellow classmates for their efforts in the constructive feedback at every seminar.

Linnaeus University
24th of May 2017
Anthony Claeys & August Le Gal
## List of Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>LML</td>
<td>Last Mile Logistics</td>
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<td>SLML</td>
<td>Sustainable Last Mile Logistics</td>
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<tr>
<td>TBL</td>
<td>Triple Bottom Line</td>
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<tr>
<td>CSR</td>
<td>Corporate Social Responsibility</td>
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<td>GHG</td>
<td>Greenhouse Gas</td>
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<tr>
<td>AFV</td>
<td>Alternative Fuel Vehicle</td>
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<td>EFV</td>
<td>Electric Freight Vehicle</td>
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<td>HVO</td>
<td>Hydro treated Vegetable Oil</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organization</td>
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The aim of this chapter is to provide an introduction to the research project by presenting the background, discussing the issue and by stating the research questions and their purpose. The methodological framework of the project is also presented.

1 Introduction

1.1 Background

1.1.1 Traditional logistics and related economic, social and environmental issues

Logistics activities have always played a paramount role in the economic and social development (McKinnon et al., 2010). Moreover, recent academics and researchers have given stronger interest to the field as part of the economic performance measurement of businesses (Christopher, 2005). The field has developed through the globalization phenomenon and the rising demand for worldwide products and services. Moreover, the author states that nowadays, logistics operations are an important part of any business. It benefits from greater attention than ever before due to the higher demand around the globe for distribution and sourcing. However, companies operating in logistics were mostly focused on raising the performance of the operations, by cutting back on costs, improving the efficiency, and delivering a better customer service (Lemoine, 2003).

Nonetheless, the increasing awareness and concern of citizens/consumers and governments of the environmental and social effects of logistic transportation is putting pressure on international firms, as well as on SMEs operating locally (Tavasszy et al., 2003). Logistics must face the concept of sustainability and present great challenges for the future. Companies that focus on the TBL of their logistic activities are implementing the young concept known as “Sustainable Logistics” that aims at matching economic performance with low environmental and social externalities.
Most definitions of sustainability incorporate a consideration of at least environmental and economic concerns, and even CSR conceptualizations and operationalizations consider the intersection of social and environmental issues. One of the most comprehensive and commonly quoted ones is the one pronounced by the Brundtland Commission:

“development that meets the needs of the present without compromising the ability of future generations to meet their needs.” (Brundtland Commission, World Commission on Environment and Development, 1987, p. 8)

However, because the Brundtland Commission’s definition is so far reaching, organizations often find it difficult to determine their individual roles within this broader, macro-economic perspective (Shrivastava, 1995a; Stead & Stead, 1996), which may undoubtedly be one of the reasons organizations oftentimes encounter issues in laying out a clear plan on how to achieve the goals of the TBL (triple bottom line).

The logistics activity has always been part of businesses and played an important role in their effective performance and growth (Walters, 2003). More recently, with the growing global concern for the environmental and social issues in general, companies are adopting a different approach to their logistic activity, by considering not only cost efficiency concerns, but also now the environmental and social impact of their operations (McKinnon et al., 2010). Trends in logistics are shifting towards sustainability-focused operations that could both improve the company's performance and efficiency, and reduce their environmental and social footprint. The transportation function is often described as the most environmentally damaging operation within logistics (Wu and Dunn, 1995; Rogers and Weber, 2011). Therefore, the actors who are involved in the transportation part of the logistic operations, have the direct power to re-shape these operations in order to make it more sustainable; in other terms reducing CO2 emissions, introducing vehicles that use cleaner/renewable energies (which takes into account both environmental and social aspects) and most interestingly businesswise, reducing energy costs, hence operational costs amongst others (Dekker et al., 2012).
Limits have been set by the European commission (2011) on reducing the greenhouse gas emissions by 50% by 2050, and some countries are taking it even one step further by becoming completely CO2-free by 2045 (Sweden). On the other hand, an increase of the world population and global economic growth is expected (Becker et al., 1999). Therefore, the demand for products and services will increase over time. Sustainable logistics will play a major role in the sustainability of transportation and the reduction of social and environmental impacts (Smokers et al., 2014). Besides, there are economic benefits of choosing more sustainable logistic practices since fuel costs are not renewable and represent an important part of the total vehicle operating cost, including the oil prices which are foreseen to increase (Dey et al., 2011). Therefore, for cost and efficiency optimization, the use of fuel efficient vehicles will be more and more in demand (McKinnon et al., 2010 p. 229).

According to the Eurostat’s latest indicators on the sustainable development of transports, European freight transport is responsible for a fifth of the total Greenhouse Gas (GHG) Emissions. However, this rate has been decreasing since 2007 due to the economic crisis and intensified government regulation regarding CO2 emissions. The new sustainable transport system will have to deal with efficiency issues in terms of energy consumption and eliminate environmental and social burdens.

Also, according to major international air pollution indexes, the air pollution in urban areas is getting worse on a global level. Between 2008 and 2013, the global air pollution in cities increased by 8% (Ramsey, Business Insider, 2016), and 80% of all those urban areas have air pollution levels that are considered unhealthy (World Health Organization). The situation is even worse in developing countries such as China and India, where urban air pollution represents a major risk of lung cancer as well as other health problems that the populations are facing, and LML undeniable has a part of responsibility in it.
1.1.2 Sustainability in LML

City logistics/LML is defined as the process of total optimization of logistic activities in urban areas considering economic, environmental social and safety aspects (Taniguchi, 2014). Sustainability is a concept of high importance in LML in the food retail industry (hereafter FRI) and refers not only to ecological or “green” aspects of LML but also to how it is planned, the policy behind it as well all social activities that contribute greatly to the society, the environment and the economy (Schiller et al., 2010). The author also claims that the importance of sustainability can be seen more in public transport than in freight transport where a lot is yet to be achieved.

Although it is not unusual to find various definitions of a concept during the first stages of its development in practice or in research (Kuhn, 1996), the differences are not as great as one may believe, as is in the case of the definition of SLML. As noted by Gladwin et al. (1995, p. 876), “definitional diversity is to be expected during the emergent phase of any potentially big idea of general usefulness.” (Carter & Rogers, 2008).

A considerable amount of theoretical literature on SLML has been developed over the recent years. However, empirical studies in this field are fairly limited. About 68 percent of the Global 250 firms generated a separate annual sustainability report in 2004 which considered environmental, social, and economic issues, in contrast to the primary emphasis on environmental reporting in 1999. In addition, 80 percent of these reports discuss supply chain-related issues (KPMG, 2005). These reports englobe overall efforts, and information regarding sustainability efforts in SLML precisely lacks. Unfortunately, a review of the literature will show that the term sustainability has been inconsistently defined and applied in the extant research (Gladwin et al., 1995, p. 877). They also argue that supply chain professionals are in an outstanding position to have an impact on sustainability practices.

1.1.3 Food retailers

Generally national and international food retailers are considered to have important power and position in the supply chain, since they are in between a range of suppliers
as well as the final customer (Hingley, 2005). The author stresses the fact that especially in the FRI, the control over the supply chain is in the hands of the retailers, who pressure suppliers and who have the power to redesign their supply chain. Even though some major forces such as the consumers, the government and international regulations influence the operations of businesses towards more sustainable practices, few are the firms that have drastically paid attention to the TBL and that have re-designed their operations in a sustainable manner (Tang et al., 2012).

Therefore, by investigating the operations of a sustainability leader in the Swedish FRI, this study will be able to draw some relevant insight on sustainable operations, with a specific focus on LML. Therefore, since food retailers have considerable power to change their supply chain and re-design their operations, they are in the right position to improve the balance of the TBL, to be economically profitable, environmentally respectful and socially conscious when carrying out their everyday operations.

1.2 Problem Discussion

Over the recent years, there has been an increasing amount of research literature on the impact and involvement of retailers on sustainable logistics in the SCM (supply chain management) and their role when it comes to taking initiative to produce positive change (Wiese et al. 2012). City center located retailers usually control and monitor the LML operations, which is often the most expensive, least efficient a most polluting part of the transportation in the supply chain (Gevaers et al., 2011).

In Sweden, most stakeholders agree on the importance of sustainability in many areas, of which LML is an important factor in cities. Local, regional and national authorities strive to regulate the carbon emissions and recently have pledged zero emissions by 2045 (Farand, Independent, 2017). The companies present in the country need to adapt, listen to consumer concern and meet the regulation policies of the government. However as discussed above, the company's primary objective is to reduce operating costs and provide better customer service, and the object of
sustainability can therefore be seen as an obstacle to profitability. However, the quality and environmental benefits of a product highly influence their purchasing behaviors/choices, which compromises the relevance of the previous statement, in this case (Irandoust, 2016). Since food retailers have the power to re-design their logistics operations to make it more sustainable by paying attention to the TBL and by pressuring suppliers, they thus also have the power to achieve SLML.

Even though the governments play an important role for setting rules and regulating the system in terms of measures food retailer must take, businesses are the ones who have considerable resources, knowledge, direct communication with consumers and detain the capabilities required in order to make the actual shift towards a more sustainable society. Hence, “businesses play a key leadership role in this process” (Tukker et al., 2008, p.50). A common belief may be that the large organizations are the ones who have this power. For this transition to be effective and for a true shift to take place, it needs to be done by organizations “that are large enough and powerful enough. Without their support, restoring natural systems and healing social inequities takes longer and may be impossible” (Willard, 2012, p. 4). However, the fact is that retailers play an increasingly important, and even a major role in this field because they are the ones that are directly in contact with consumers who are increasingly aware and concerned about the existing social and environmental issues of today’s society (Carrigan & Attalla, 2001; Peattie, 2001, 2010).

The transportation function, for instance, is often described as the most environmentally damaging operation within logistics (Wu and Dunn, 1995; Rogers and Weber, 2011). Therefore, retailers play a key role in making the transportation function more sustainable, especially the LML that they often have far more control over compared to long haulage logistics. Retailers have the power to reshape inbound logistics and make it more environmental friendly. How they integrate the three aspects of the TBL in their LML operations, what can be done to make them more aware of the issues, and what would be necessary to get them to take action are some of the questions that may be raised in regard to these issues. It is also important for the retailers to purchase from suppliers who engage in sustainable practices, and to build long-term relationships with them with sustainability-oriented goals.
Retailers can build environmental awareness along the supply chain and are often held responsible for the actions of other supply chain actors, as they have contact with both consumers and suppliers (Kolk et al., 2010; Wiese et al., 2012). Through internal and external stakeholder pressure, education and shared concern for sustainability issues (congestion, pollution, accidents, employee well-being, etc.), there are ways food retailers can achieve more sustainable LML practices.

**How does Axfood, one of Sweden’s largest urban food retailers operate LML through more sustainable methods of transportation?**

Urban freight transport faces several challenges due to the presence of multiple stakeholders (local authority, logistic operators, retailers, NGOs, consumers, society, etc.) and their interests and objectives that often diverge (Ruesch et al., 2010). From a retailer perspective, the goal is to reduce the operating costs and increase the level of services in order to remain competitive (Rao et al., 2005). These objectives were reached but mainly with unsustainable practices such as just in-time delivery and small parcels delivered by almost empty delivery vans (McKinnon et al., 2010). The author argues moreover that LML have thus had a considerable influence on congestion, which has been on the rise over the past years. Logistics firms therefore have a part to play in resolving this issue. So far, the environmental impact has not really influenced their choice for more sustainable transportation means (Walker et al., 2008). Government regulations and customers’ concern thus contribute to retailers adopting more sustainable logistics practices.

Hence, more insight could be found on the drivers that motivate retailers to adopt SLML practices without losing competitiveness and simultaneously decreasing the negative environmental and social impact of their operations. For long, the logistics function has been seen as a marginal activity. However, recently, with the increase of fuel and energy prices along with the growing global awareness of the environmental impact of transportation logistics, there is a greater need to improve the sustainability of LML, which is the most polluting part, and to take a greater leap towards SLML. Market-leading Swedish food retailers that operate in large cities are concerned with
sustainability issues and thus constantly seek to improve their practices regarding sustainability and thus various drivers involved may be analyzed. Moreover, the specific drivers of these sustainable operations can differ from one food retailer to another. Therefore, analyzing the practices and drivers of a food retailer that stresses very highly on social and environmental issues and not only one the economic ones provides relevance to this study and raising the following question.

**What are the motivating drivers for making the LML operations more sustainable regarding all three aspects of the TBL, particularly regarding CSR and environmental issues?**

**Research Gap**

Abundant previous literature can be found on different aspects of sustainability and empirical studies have been conducted on the topic of sustainability in logistics (Dey et al., 2011; Marchet et al., 2014). In addition, extensive research has been carried out in the field of sustainability in the FRI focusing on various aspects such as sourcing (Sim et al., 2007), and food quality and safety (Akkerman et al., 2010). However, research in the specific field of sustainability in the LML operations of food retailers with a focus on the achievement of all three dimension of the TBL is under-represented in available literature, calling for development and empirical validation to support, validate and progressively construct solid ground under the limited theory available. Furthermore, there is no existing academic literature on the case of SLML of food retailers with a particular focus on the Swedish market, which gives relevance to the chosen topic. This case study analysis should provide empirical findings that tend to cover this specific research gap.

**1.3 Problem Statement**

LML do not only account for a great deal of carbon dioxide emissions. There is a visible shift in many cities towards cleaner and more sustainable methods of logistics transportation (i.e. with low CO2 emissions or even CO2-free), and the ultimate goal
is to have sustainable transportation. The current status demonstrates that it is critical to encounter solutions and to explore and understand the SLML operations of a major Swedish food retailer, and to understand the reasons and motivation of doing so. Furthermore, it would be interesting to understand what can be done for the food retailers who do not possess a good sustainability record (i.e. poor CSR and CO2 emissions record for instance) to improve and proceed to the necessary changes within their supply chain, and become more competitive in terms of sustainability for their LML. Improving the sustainability of LML has its many benefits (Faccio & Gamberi, 2015): less congestion and vehicles circulating, less CO2 and noise pollution, fewer deliveries per retailer though maintaining delivery quantities, etc.

1.4 Research Questions

RQ1: How does Axfood, one of Sweden’s largest urban food retailers operate LML through more sustainable methods of transportation?

RQ2: What are the motivating drivers for making the LML operations more sustainable regarding all three aspects of the TBL, particularly regarding CSR and environmental issues?

1.5 Purpose Statement

For the purpose of identifying and analyzing how a FRI leader operate SLML and what the drivers are as well as understanding these, this project studies the sustainable logistic practices of a leading national food retailer in major cities, across Sweden, in order to identify how more SLML operations could be achieved and to obtain more insight on this topic which remains relatively unexplored. The “more” in RQ1 simply means constantly seeking improvement. The aim of this research project is to define the ways in which retailers located in urban areas could make their supplier or other partners in their supply chain comply with their environmental
friendly, socially aware and performance driven operations, and how they manage their inbound LML in a more sustainable way.
This chapter describes the methods used by the authors to carry out the research project. The different parts will provide a better understanding on the research philosophy, strategy and approach adopted. Moreover, the research design, the data collection, and data analysis methods will be presented, and the motivation for each choice of method will also be developed in this chapter.

2 Methodology

2.1 Research Philosophy

In this sub chapter, the authors will specify the choice of the research philosophy according to the epistemology; that is, the perspective or view of what constitutes reasonable knowledge and the ontology, meaning the way the knowledge is developed and the assumptions retained (Prasad, 2005; Saunders et al., 2011). The reasons of these choices and their implications are given by the structure and specificities of the research methods and desired outcomes.

2.1.1 Epistemology

The interpretivist philosophy takes a subjective perspective of reality and emphasizes that humans are different from physical phenomena because they create meanings (Saunders et al, 2011).

Interpretivism, which is characterized by small samples and in-depth investigations and is suited for qualitative research, where the goal is understanding, rather than predicting (Saunders et al, 2011). The main assumptions of the interpretivist philosophy are the multiple-socially constructed nature of reality that aims at understanding and focuses on what is specific, unique and deviant.

The Positivism philosophy relates to “the philosophical stance of natural scientist and entails working with an observable social reality to produce law-like generalizations” (Saunders et al., 2011). Therefore, observable facts and phenomena are considered as accurate data. The philosophy is often carried out when applying
qualitative research methods with large samples and structured research approaches (Saunders et al, 2011).

These two philosophies are drastically opposed in their nature of defining reasonable knowledge and therefore they may be considered as the two major philosophies in epistemology.

### 2.1.2 Ontology

Ontology is concerned with the nature of social reality and knowledge, and what the author view on the nature of the reality is. Two main ontology philosophies are opposed on their view of the nature of knowledge. **Realist** ontology argues that reality can be objectively measure and does not depend on human action and observation (Blaikie, 2007). On the other hand, the **Relativist** ontology assumes that reality as we know it is constructed in an intersubjective manner, through the meanings and understandings developed socially and experientially (Guba et al., 1994). This philosophy believes that opinion has no absolute truth or validity and therefore it is subjective to each individual or each group. The truth is only applicable and limited in context.

### 2.1.3 Research Philosophy of this Study

In the context of this research, the relativist ontology applies because the conclusions of the study will come from the author’s understanding and subjective interpretation of the findings, and therefore will not provide absolute truth nor validity, yet it may be applicable in a limited context (in Sweden, in certain cities, for some retailers, with comparable factors, etc.).

The main reasons behind philosophical classifications of the study are presented hereafter:

- First and foremost, our study focuses on a one case that could give us insight on the issue. Indeed, our research will study LML practices of a specific food retailer that is located near city centers. The chosen company is a
sustainability leader with important capabilities and influences in its supply chain.

- We aim to understand how food retailers implement their sustainable practices. Our research will stress on how a sustainability leader food retailer operate LML. We want to find out what the main drivers are, that enable them to implement sustainable logistic practices and which are the main drivers for change.

- The primary data obtained from the interview and observations with the Swedish food retailer will be interpreted according to the authors’ judgement. Literature analysis is also subject to the authors’ points of view.

Since the aim of the study is to analyze factors affecting leadership, management and decisions, the philosophy adopted is the authors have chosen the interpretivism philosophy. They aim to understand how retailers deal with their LML when considering the economic, environmental and social aspects of their operations. The case will be analyzed from in-depth qualitative investigations.

Therefore, interpretivism research perspective is the most appropriate one for carrying out our study. Understanding the driving forces that shape SLML operations of food retailers constitutes socially-constructed and interpreted knowledge. The objective is to capture empirical data and insights on a specific domain and to establish a common understanding on the issue, by comparing it to previous literature and studies, and to provide the reader with our own conclusion based on the single case study.

The implications of our research philosophy on the research strategy in general and the choice of primary data collection methods in particular are described in the following points.

**2.1.4 Primary Data Collection Methods**

- The appropriate strategy for our study is to implement a qualitative research method that will be used in order to obtain answers on “how” the retailer
operate its LML in regard to sustainability and why the managers make certain decisions.

- Data collection will be carried out to obtain more insight from the retailers’ perspectives that are relevant to understand the issue. Since our research attempts to understand how a company in the FRI aiming for best sustainable practices deals with the sustainable factor in its various logistic operations, generalizations may further be developed in the case of urban food retailers.

- The use of semi-structured interview will provide us with sufficient data in order to develop a case study analysis of the retailers’ sustainable practices. By focusing on the key drivers that affect the LML operations of the company, we can gain insights on the decision-making process regarding sustainability in city logistics.

2.2 Research Approach

The question that arises concerning the research approach is that the conclusion of the study will be based on either empirical evidence, or on the logical assumptions that are related to previous research and theories (Ghauri & Gronhaug, 2005). The two approaches to theory are called Inductive and Deductive (Saunders et al., 2011).

2.2.1 Deductive Approach

It is an “approach to theory development involving the testing of a theoretical proposition by the employment of a research strategy specifically designed for the purpose of its testing” (Saunders et al., 2016). It is carried out by gathering previous data from literature and studies. Hypotheses and predictions based on prior data are commonly used to test the existing theory. The deductive approach is suited for qualitative research studies (Saunders et al, 2011).
2.2.2 Inductive Approach

It is an “approach to theory development involving the development of a theory as a result of the observation of empirical data” (Saunders et al., 2016). Inductive reasoning is referred to as a type of logical reasoning in which inferences and general principles are drawn from specific observations or cases. Inductive reasoning is a foundation of the scientific method and is the process by which testable hypotheses are formed from particular facts and observations (Wienclaw, 2015).

2.2.3 Approach Adopted

Deductive approach

In the case of this study, the retailer, the logistic operators and the local authority are referred to as participants and are taken as a base for elaboration of the research’s conclusions that will be drawn from the testing of theoretical propositions by carrying out research to confirm the various hypotheses, thus making the deductive approach more suitable for this qualitative study, according to Yin (2012). Giving voice to participants will provide the study with empirical insight from the specific field. The research questions’ answers will thus be provided following a deductive approach that will rely on both primary and secondary data. Although it is not the main method for the development of this research, the inductive approach is to a small extent adopted for theory building.

2.3 Research Strategy

Adopting a research strategy is a critical requirement since it relates to the fundamental aspect of the study (Harwell, 2011). Bryman and Bell (2011) claim that a study can be carried out by adopting one of two distinctive research strategies: quantitative or qualitative.
2.3.1 **Quantitative Method**

This method studies relationships between numerically measured factors and is linked to statistical practices (Saunders et al., 2016). This method excludes personal perceptions, relying on objectivity to dictate its reality, meaning the researcher adopting this method must carry out their study without prejudices and leaving aside their personal opinion (Bryman & Bell, 2011; Harwell, 2011). The previous authors thus claim that this method must provide findings that are objective, replicable, and generalizable.

2.3.2 **Qualitative Method**

Qualitative research is usually selected for answering questions as *how* or *why*, due to the fact that it aims at an in-depth understanding of a given issue rather than to seek empirical data to support hypotheses. In other words, qualitative research can be described as “Scientific research in which observations cannot be or are not quantified, that is, expressed in numerical form” (Wienclaw, 2015).

2.3.3 **Method Chosen**

The qualitative method is the research strategy used for this study. Since our research questions are based on “How” and “Why”, it is the most adequate strategy to adopt for this project, considering the complexity of these types of questions. There is a wide range of qualitative research methods such as research demonstrations, focus groups or case studies amongst others. The latter is relevant for the study of emergent questions and contemporary issues. In this paper, the authors have given peculiar attention to the real-life issues emerging from an environmental aspect such as pollution issues, the irresponsible and unsustainable use of natural resources as well as a range of social and economic issues that today's world must urgently resolve.

As stated previously, the last mile practices of a Swedish food retailer will be investigated, and the authors will study how this is operated and whether the main drivers are identical to those found in sustainable logistics literature or if there are others, specific to LML in the FRI. Furthermore, the study will involve a single case
analysis of the different approaches and practices of a sustainability-leading food retailers’ LML.

2.3.4 Exploratory Research

The objective of studies with an exploratory research strategy is to gain significant insight from phenomena (Saunders, et al., 2009). This research design is useful to get a better understanding of an issue (Saunders, et al., 2009) which is why the findings to the research questions aim at providing an overview over topics that lack empirical support. The design itself is variable in nature and changes during the course of the research are common. In the early stages, there is a broad focus which is narrowed down during the research process (Saunders, et al., 2009).

2.3.5 Descriptive Research

Descriptive research aims at describing the more precisely possible a certain situation or phenomenon in which the questions are formulated in a way that the answers should draw a picture of the studied object (Punch, 2013). This strategy focuses on describing the phenomenon rather than giving an explanation on the situation/phenomenon.

2.3.6 Explanatory Research

Explanatory research is based on the previously mentioned descriptive research that provides a clear description of the phenomenon, completed with an explanation of what has happened (Punch, 2013). It analyzes a situation or a problem to spot out the links between the variables (Saunders, et al., 2009). Explanatory research questions often ask “why” a situation is occurring the way it is observed.

2.3.7 Research Strategy of this Study

The explanatory research strategy fits the most this study, since it aims at giving a detailed description of the phenomenon (SLML operations in the Swedish FRI) and
questioning why the situation occurs this way (what are the motivating drivers that are pushing urban food retailers to adopt such practices?).

2.4 Research Design/Method

According to Yin, there are 8 main different research strategies:

- **Experimental strategy** needs the researcher to manipulate the behavior of the participants and therefore is not suitable with this case study that is seeking to understand the drivers of the participant’s behavior.

- **The surveys** are used to find patterns and identify relationships between variables (Bryman & Bell, 2011; Saunders et al., 2011). They mostly focus on quantitative data, and therefore is not the appropriate strategy for this study.

- **The archival analysis** focuses on the development of a situation from the past to the present (Saunders et al., 2011). This strategy would work with a deductive approach, based on previous empirical data and theories, however in this case the purpose is to find results and answers from observations of the present and not from the past patterns.

- **The case study strategy** is an in-depth inquiry into a topic or phenomenon within its real-life setting (Yin, 2014) and it is the one adopted by this study that best covers the purpose and strategy of the research.

- **Ethnography research** is used to study the culture or social world of a group and is suited for qualitative research methods. In this case, the focus is not placed on cultural or social aspects but specific management decisions and economic, social and environmental triggers affecting business operations.
• **Action research strategy** implies an organizational learning to produce practical outcomes through identifying issues, planning actions, taking action and evaluating action (Yin, 2014). In this case the study is not trying to solve a problem, but instead to understand the structure and drivers of the operations.

• **Grounded theory** refers to the theoretical explanation of social interactions and processes in a wide range of context, including business and management. This strategy is suited for qualitative research (Saunders et al., 2011). Since there is limited amount of empirical data in the domain of this study, the grounded theory strategy is not the most appropriate one.

• **Narrative inquiry** seeks to preserve chronological connections and the sequencing of events told by the narrator to enrich the understanding and aid analysis. (Chase, 2011). Interviews are the most common use of narrative inquiry strategy for data collection and analysis.

### 2.4.1 **Single-Case study or Multiple-Case study**

Case studies are useful methods when dealing with contemporary phenomena and when the issue can be applied with real life context (Creswell, 2014). Case studies are mostly descriptive and consider specificities of a small group of people or units (Yin, 2014). Case study common definition: “The essence of a case study, the central tendency among all types of case study, is that it tries to illuminate a decision or set of decisions: why they were taken, how they were implemented, and with what result.” (Schramm, 1971)

### 2.4.2 **Single-case design**

Axfood will be subject to a case-study through conducting an interview and several follow-up questions regarding its SLML practices. The single company which is a recognized leader in its industry in terms of SLML will be highly relevant for understanding the phenomenon and for qualitative theory-building (Yin, 2014). Other food retailer in Sweden such as Coop and ICA may also claim to be
sustainability leaders. In Sweden, it is commonplace that companies are responsible and accountable for social and environmental issues due to rising consumer concern and explicit communication thanks to social media for example (Rotter & Mark-Herbert, 2013). Although these market-leading Swedish retailers claim to be best in sustainability practices, Axfood has been chosen for this study.

Although they do not lead in terms of annual turnover, they are not less involved in sustainability issues. One example can be found in the study by Rotter and Mark-Herbert (2013) where they focus on the issues of a product which was socially and environmentally controversial (child labor, environmental sustainability of production methods, etc.). They discovered that unlike the main competitors, they took bigger steps into investigating the issue considering all stakeholders, even if this meant profit loss. When the TBL approach is adopted in the retailer's operations, the driving forces of these best practices can be identified. The perspective of the company’s top management will be considered and therefore the different drivers of sustainability could be explored and eventually understood in their context.

Although many may argue that multiple-case studies should be preferred to single-case studies, Yin (2014) argues that single-case studies carried out in a limited timeframe raises chances of producing high quality theory, a deeper understanding due to the fact that more attention is given to the particular case. The single case design represents a critical test to the theory with a specific focus and rather than concluding the study it will seek to develop ideas or ground for further study (Yin, 2009).

According to Yin (2003) a case study is an “empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident”.

Previously the authors have defined the relevance and advantages of the single-case study research method. By examining the SLML practices of Axfood, the study will look into the most relevant and insightful case of SLML. Yin (2014) has classified the case-study methods in a matrix of four different designs according to the unit of
analysis and the number of cases. There are two designs regarding the single-case study that could be either Holistic (using a single unit of analysis) or Embedded (using multiple units of analysis) in the same context.

In this single-case study, the authors seek to understand how the food retailers operate their LML regarding sustainability objectives. The most effective way to understand its practices is to use a single unit of analysis that could give more accurate and in-depth insight on the retailer's practices. Therefore, conclusions will be drawn from a single case (the most sustainability-oriented Swedish food retailer), using a single unit of analysis, which is the sustainability factor.

### 2.4.3 Data Collection Methods

The data collection process will be divided in two parts. The first part is accomplished beforehand by reviewing previous literature and by gathering existing empirical data. This will constitute our database of secondary data and will be the basis for the creation of the unit of analysis and the underlying primary data collection methods. An in-depth interview and email discussions conducted with the chosen food retailer as well as the logistics operators. By using a single unit of analysis (including all aspects of the TBL), the Swedish food retailer will be considered regarding its LML practices.

Both primary and secondary data is used to carry out the analysis. The information gathered should present the drivers for SLML regarding the TBL. This will provide the study with insight on the drivers of decisions made top management in terms of SLML operations.

A single sustainability-oriented food retailer will be taken into consideration for this study. The research questions focus on “how” and therefore seek the answers related to the main drivers of SLML. In order to find the appropriate answers and data, the unit of analysis is to be defined. The study will look into the drivers of sustainability in the LML part, thus the different drivers of sustainability that affect the operations
which will set the unit of analysis in order to understand the retailer’s drivers for best sustainable practices.

2.4.4 *In-Depth, Semi-Structured Interviews*

This type of research involves data about the opinions, attitudes, or reactions of the members of a sample are gathered using a survey instrument. The phases of survey research are goal setting, planning, implementation, evaluation, and feedback.

To better capture the right data that will answer the issue of this study, the semi-structured interview is preferably applicable. By using the data provide by Åsa Domeij of Axfood, the appropriate data for the analysis will be collected. Since the purpose of the study is mainly of exploratory and deductive nature due to the fact that the authors seek to understand and confirm the main drivers of SLML, the in-depth and semi-structured interview is the most relevant method in the research design. Although only one face-to-face interview is carried out, further follow-up exchanges take place (phone and e-mail).
Figure 2.1: The figure hereafter illustrates how the research will be conducted:
Source: Own creation.

2.5 Data Collection Strategies

2.5.1 Data Sources

Primary data: Data from email discussions and semi-structured interview with the Head of Environment and Social Responsibility of the retailer studied, Axfood, will constitute primary data for this study. The chosen retailer is the third largest Swedish food retailer in terms of turnover with considerable resources, lobbying power and influence and sustainability-oriented practices that are present in city centers of
Sweden’s major cities, where most issues regarding SLML need to be overcome. Only one significant food retail leader in sustainable practices with the power to redesign their LML operations is therefore taken into consideration.

**Secondary data:** This includes statistics, information and facts collected by other researchers (Collis & Hussey, 2009). Credible documents for extracting information, according to Weimer and Vining (2010) include academic sources (journal articles, books and dissertations); publications of third party intelligence, interest groups and consulting firms; government publications; and popular press. Secondary data is data collected from previous research studies in the field.

It will be carried out using a semi-structured interview, in depth investigations and email discussions with the chosen food retailer. The participants will provide the study with relevant empirical data to answer the research questions. Moreover, literature review and previous studies will guide the authors to direct the research towards seeking relevant information and analysis to complete the gap in the existing studies. Eventually the findings from the case study will be a base for analytical comparison with the existing theories, by considering the available previous empirical data on last mile city logistic operations. As presented in the introduction chapter, the Swedish government and the present businesses highly regard the sustainability factor in all their operations.

**2.5.2 Methods**

In the case of this research paper, the in-depth interview with top management of a sustainability-leading Swedish food retailer will be key. It consists of a guided conversation (Yin, 2014), in which either unstructured (specific) or semi-structured (general questions) approaches are possible (Bryman & Bell, 2011). The special advantage of the unstructured method is that it generates more creativity and ‘outside the box’ thinking, and the potential to provide unexpected information (Bewley, 2002) and possibly generate new answers which will be highly valuable to the outcome of this project. Conversation analyses and documents including e-mails/messages, company reports and websites mainly will be will relevant (ibid).
Hence both primary and secondary data will be collected, although the critical source of information to answer the research questions will be sourced from the primary data (interview & emails). On the other hand, ethnography requires a certain amount of research time and accessibility to companies which the authors do not possess and will therefore be left out.

The interview method will be the semi-structured one, which provides the interviewees with the guidance needed to provide the researchers with accurate information. Finally, secondary information (articles, company reports, websites, etc.) will be collected in the interest of supporting and confirming statements made by the interviewees.

Nonetheless using the semi-structured interview method for our research possesses a few drawbacks. Several interviews would have to be carried out to make general assumptions and conclusions about the topic. However, carrying out a single-case study allows for a more in-depth analysis which the timeframe of this project would not allow in the event of a multiple-case study.

### 2.5.3 Limitations

The research data collection strategies present some limitations that are described hereafter:

- The data will be collected from a single food retailer located in Sweden, and therefore certain factors that affect the operations may be due to some specificities of the country and cannot be generalized on an international level.

- The research only focuses on SLML operations in the FRI, and therefore does not consider the supply chain as a whole. It is limited to the final part of the logistic operations to focus more in-depth on this specific part of the supply chain.
The scope of this study will be limited to the perspective of the retailer’s top management, due to the time constraint of this project. This may render the project more specific, aiming for depth rather than breadth.

The data collected comes from various sources. Secondary data will be gathered from company website, annual reports, online articles, previous academic literature and scientific papers related to the topic. By carrying out a semi-structured interview and email discussions with the chosen food retailer, primary data will be collected to provide first hand insight.

2.6 Sampling

Sampling has no general definition and is seldom explicitly stated in literature and research publications (Gentles et al., 2015). Therefore, we defined sampling in qualitative research in its broadest sense as follows: the selection of specific data sources from which data are collected to address the research objectives. In case study methodology, the sampling applies to selecting cases and selecting data sources “that best help us understand the case” (Stake, 1995, p.56).

This study emphasizes on the specific LML process of a sustainability oriented food retailer present in Sweden. Since the LML process is the last step of the transportation chain that regards the transport of goods from the hub to the final point of consumption. Those hubs are distributed near important highways and are often located on the suburbs of cities. Therefore, the food retailers that the study focusses on should be located in city centers or surrounding areas will constitute the population, in order to study their LML practices. Sweden’s largest cities (Stockholm; Gothenburg and Malmö) are being the busiest ones, thus facing greater congestion issues are where it is most important to mitigate these issues for the future. Since LML practices and operations in the FRI are designed at a national level, the right sample is a Swedish sustainability oriented food retailer which detains a strong presence in major cities. The sampling criteria are therefore to be a major
national food retailer operating in Sweden’s most important cities, and with a specific focus on SLML.

The aim of the research is to understand the main driving forces that make the food retailers shift towards sustainable logistics practices. Therefore, it is necessary to choose the right food retailer that has the power to reshape/re-organize their LML operations. The food retailer chosen is third in terms of market share and nationally recognized in terms of best sustainable practices (is the selected unit for the study); present in Sweden’s major cities is thus the case studied in this project. The chosen food retailer will be presented and analyzed in the following chapter.

2.7 Data Analysis Method

The data analysis method will be selected from the different techniques and strategies, to define the drivers that apply for SLML operations from a single case study.

Analytic techniques (Yin, 2013):
- pattern matching
- explanation building
- time-series analysis
- logic models
- cross-case synthesis

Four general strategies (Yin, 2013):
- relying on theoretical propositions
- working your data from the “ground up”
- developing a case description
- examining plausible rival explanations

Exhaustive data (primary and secondary) on Axfood’s SLML practices will be collected. This will then be used to describe and to analyze the case using graphics,
pictures and possibly charts (Yin, 2014). The explanation building technique implies making an initial theoretical statement or proposition (Yin, 2014), drawn from the existing theories on sustainable LML in the FRI, that will in turn be compared to the findings of the case study (the collected empirical primary data). Explaining the phenomenon of SLML operations in the Swedish FRI will be done by finding the causal links between theories and empirical data, and by looking into how the operations are carried out in a more sustainable way, and why was SLML adopted. Previously the authors have presented the different elements that could drive retailers to render their LML operations more sustainable. Rather than generalizing, which would require a multiple-case study, this project will focus on a single retailer and study how they, in their specific industry in Sweden are driven to make their LML operations constantly more sustainable, through an in-depth analysis of the case rather than a more superficial collection of data from various organizations.

2.8 Data Quality

For this type of qualitative study, the data quality is often perceived as non-reliable, since it cannot be generalized. It focusses on one case and the data provides insight that is interpreted and analyzed according to the authors’ judgments and are therefore not necessarily generalizable. However, the qualitative study will provide insight that could then be useful for further studies and to create or strengthen the reliability of the knowledge. The empirical findings and the case study analysis of the single case will provide the reader with solutions and answers from a real-life case on sustainable LML. Although the study is limited to only a one specific case, the objective is to strengthen or to refute the theories on the topic of sustainable LML, allowing the results to apply to other retailers.

2.8.1 Construct Validity

Yin (2014) supports that researchers often do not operationalize their measures, leading to an outcome of relatively subjective judgments, providing personal
perceptions rather than using objective data to draw conclusions. To fulfil the criterion of construct validity, the author claims that two steps must be followed:

1. defining (for this project), the food retailer’s LML operations and drivers regarding specific concepts and linking them to the study’s objectives and;

2. Determining operational measures that fit the concepts by citing scientific studies that may confirm/support those.

2.8.2 Internal validity

Yin (2014) states that pattern matching, explanation building, rival explanations and logic models are the main techniques used to guarantee internal validity in the data analysis process. The internal validity is thus respected by using the explanations building method to provide answers to the research questions and guarantee a certain level of internal validity to this project.

2.8.3 External validity

This refers to the fact of applicability of the findings in other situations and contexts (Whittemore, et al., 2001). By carrying out a single-case study, it will not be possible to generalize or provide any sort of statistics. However, this method has over the years gained much interest in testing and generating theory (Eisenhardt & Graebner, 2007; Gibbert et al., 2008; Lee et al., 2007; Platt, 2007; Siggelkow, 2007; Yin, 2009). Furthermore, other authors claim that this approach is likely to produce more complicated theories than multiple-case studies which focus for on breadth and generalization, and that theory can be fitted more accurately to the many details of a particular case, whereas multiple cases can only retain what is replicated across the various cases (Eisenhardt & Graebner, 2007, p. 30).
2.8.4 Reliability

The goal, according to Yin (2014), is that if a future researcher carries out a study following the same procedures as the present authors, they shall obtain the same findings and conclusions as the respective previous authors. The author emphasizes the fact that it is understood to be the “same case” over again, and not a simple “replication”, with the end goal being to avoid errors and biases in the study. The case must equally be strongly documented to be reliable, which could be done by using a “case-study protocol” and by creating a “case study-database” (ibid). Furthermore, the company interviewee for this study is a veteran on the topic and has been the Head of the Swedish environmental political party in the past. In short, Yin (2014) states that as many steps as possible should be operationalized and that researchers should proceed as if they were being monitored, just as a company may be at any time audited.

2.9 Ethical Considerations & Ethics of this Research

Ethics in research can be fuzzy and range from simple clean-cut ethics (e.g. stealing is wrong,) to more complicated matters. Different groups of people may claim to possess superior knowledge of what is morally/ethically appropriate. These variations may depend on matters such as history or culture amongst others. For instance, because of the horrific and inhumane experiments that were carried out on live human beings in Germany during the Nazi era, it is often very difficult to obtain approval for carrying out medical research.

However, in the case of our study, the research ethics will comply with all actions taken out by the researchers (Lahman et al., 2011). The author also claims that researchers should not take actions that affect other parties involved: participants, research community and the public research consumer.

The main research ethics issues that should be fulfilled, as suggested by Pimple (2002) are: truthfulness, fairness, and wisdom.
This project can thus be considered as true since valid scientific and reliable sources of information are used for the development of this thesis. Furthermore, it can be said to be fair, because the authors of this thesis cite the sources of the information and ideas developed by other researchers that have widely contributed to the field of study, thus avoiding any form of plagiarism. All information provided by firms respect the confidentiality criteria, protecting anonymity requirements if requested by (the) interviewee(s).

Consent and confidentiality between the participant and the subjects involved in the study need to be determined to respect the privacy and confidentiality of the data, the company and its employees. The rights and position of the participants need to be accepted and respected throughout the study. Finally, this study aims to provide positive and enriching information to the enterprises of the industry in question, which also provide a sense of wisdom to this project.
### Methodology Summary

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<td>Anonymity, Confidentiality, Consent</td>
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**Table 2.1**: Methodology Summary

**Source**: Own creation.
The Research Onion

The following adaptation of the Research Onion by Saunders et al. (2010) reveals the choices made by the authors regarding the different research philosophies, approaches, strategies, methods and techniques adopted to carry out their study.

**Figure 2.2: The Research Onion**

**Source:** Own creation, inspired by from the Research Onion, Saunders et al., 2009.

Chosen philosophy, approaches, strategies, research and analysis methods.
This chapter is dedicated to the general description of the concepts studied and the main issue the study considers. Furthermore, previous theoretical and empirical research data will be presented as part of secondary source to provide early insight on the study questions. Eventually the drivers of SLML according to existing literature and other sources will be summarized.

3 Literature review

3.1 Defining the Study’s Concepts

3.1.1 Last Mile (Urban) Logistics

“Last Mile Delivery is the movement of good from a retailer’s transportation hub to the final delivery destination with the goal of items being delivered as fast as possible” (Carver, 2016). Walsh (2006) argues that it is a crucial part of logistics and that it is becoming increasingly complex for retailers to handle, notably due to the rising pressure of sustainability requirements. The key players (retailers, carriers, residents and official administrators) have diverging problems to solve, making it particularly challenging to overcome the different problems and to meet everyone’s demands (Faccio & Gamberi, 2015). Beyond the well-known issues encountered in city centers (nuisance, accidents, congestion, etc.), one of the greatest issues that is affecting the Earth according to a great majority of scientists is carbon dioxide and GHG emissions. This is certainly, and the one most talked about over the past years leading to terms such as eco-logistics, sustainable urban logistics or sustainable city logistics amongst others. The figure hereafter offers a simple representation of what part of logistics the last mile part is.

Figure 3.1: Basic structure of a supply chain highlighting the Last-mile part.
3.1.2 Sustainability: TBL in LML

The application of sustainable practices, of business ethics and of the TBL approach regarding the company's operations is linked to the concept of the Corporate Social Responsibility (CSR), that aims at concealing economic performance with low environmental externalities and social justice (Nicolaou et al., 2013). The TBL is an accounting framework that incorporates three dimensions of performance: social, environmental and financial (Elkington, 2004). The TBL is “simultaneously considering and balancing economic, environmental and social goals from a business point of view” (Elkington, 2004). The author stresses that the TBL reporting can be an important tool to support sustainability goals.

The Brundtland Commission (1987) has defined Sustainability as a general concept as follows: “the development that meets the needs of the present without compromising the ability of future generations to meet their needs.”

Although there are many definitions of sustainability, the differences are not as great as one may believe. Most definitions of sustainability incorporate a consideration of at least environmental and economic concerns, and even CSR conceptualizations and operationalization consider the intersection of social and environmental issues. Further, it is not uncommon to encounter varying definitions of a construct during the embryonic stages of its adoption in practice or its development in a field of scholarly inquiry (Kuhn, 1996). As noted by Gladwin et al. (1995, p. 876), “definitional diversity is to be expected during the emergent phase of any potentially big idea of general usefulness”.

Therefore, applying the concepts of sustainability and TBL approaches to LML operations means that the actors involved in the processes need to consider the three dimensions of sustainability in their everyday operations to achieve financial performance combined with social and environmental effectiveness (McKinnon et al., 2010).
Sustainability is today part of the Swedish corporate and governmental culture that pulls the society as a whole towards cleaner and less harmful practices regarding the environment and the civil society. According to the Official Website of Sweden, the country is leading by example in terms of CSR, and many Swedish companies are listed in the world's most sustainable companies (Scania, Atlas Copco, Electrolux, Ericsson etc.). CSR reporting is very common in Swedish businesses, and many of them follow the Global Reporting Initiative, a tool that aims at controlling and improving the visibility of the TBL in accounting (Hedberg et al., 2003). Moreover, the government provides sustainable and environmental initiatives through legislation and incentives for the use of clean technology (ibid).

Sustainable practices in businesses are thus receiving greater attention in Sweden than in many other countries, promoted by the government, NGOs, the media and consumers. Companies are therefore becoming increasingly understanding, knowledgeable and welcoming the TBL approach in their practices and operations. The different drivers may however diverge considerably depending on the industry, the market characteristics and customer requirements.

The main barriers to sustainability-oriented practices may include higher costs, coordination complexity and a lack of coordination in the supply chain (Seuring, 2008). The same study also states that some supporting factors such as company overlapping communication, management systems (e.g. ISO 14001) and monitoring-evaluating-reporting play a great role in sustainability implementation within supply chains in general.

3.1.3 *Triple Bottom Line dimensions, and their impact on LML operations*

**Economic dimension**

This dimension refers to the firm’s performance towards the market and their shareholders (Sridhar, 2011). Hence, the company must be capable of serving the market (Ahmed & McQuaid, 2005) whilst providing their shareholders with high returns (Dyllick & Hockerts, 2002; Ahmed & McQuaid, 2005). Christopher (2005) argues however that nowadays, the customer has become the centerpiece, demanding
deliveries that are fast and reliable, forcing the firm to deal with the cost issue that must be balanced with the customer requirement in order to remain profitable (Mota et al., 2014). In LML, what is essential is the cost effectiveness of the operations (Labuschagne et al., 2005; Mihalic et al., 2012; Cruz & Wakolbinger, 2008). Other aspects of the economic dimension that have a high impact on LML are innovation and investments (Erol et al., 2011), since making LML operations more sustainable relies essentially on innovation which often times rhyme with consequential investments.

**Environmental dimension**

For food retailers to operate in an environmental-friendly way, the impacts of their activities need to be considered in regard to the availability of natural resources, their level of carbon emissions and their footprint on the ecosystem (Kleindorfer & Saad, 2005). Although the ideal solution would be to eliminate all carbon emissions, the more likely solution considered by many companies at this moment is to find substitutes (e.g. biodiesel instead of traditional diesel). Hence, applying techniques and technologies (in LML operations) is necessary for energy saving and decreasing CO2 emissions amongst other negative environmental externalities (Gunasekaran et al., 2015).

**Social dimension**

Organizations that highly regard social issues promote actively the improvement of people’s quality of life (Gimenez et al., 2012; Cho et al., 2014). Essentially, this comprehends health (Cho et al., 2014), human dignity (Littig & Griessler, 2005) and human development (McKenzie, 2004) amongst others. A company’s social responsibility is not only limited to its employees, but also includes communities or any other stakeholders who may be affected in one way or another by the company's activities, regarding both present and future generations (Gimenez et al., 2012; Cho et al., 2014). Investments are therefore made by companies in order to improve all the aforementioned social aspects, but also others such as working conditions, education and training (Von Geibler et al., 2006; Cho et al., 2014).
According to a study by Yakovleva (2012), about the sustainability factors in the food sector, industry experts give higher weight to economic indicators as opposed to environmental and social indicators. The author also states that the weight of these indicators may differ if taken the civil society’s perspective. Moreover, in the FRI drivers for sustainability-oriented investments are mostly conveyed by customer driven capabilities, the size of the company (larger retailers tend to invest more due to higher stakeholder pressure) and the process capabilities of the firm (Claro et al., 2013).

**Balancing the TBL dimensions**

Although each dimension of the TBL has its specific characteristics, they cannot be singled out; they supplement one another (Coffman & Umemoto, 2010). For instance, reduction in fuel consumption by educating lorry drivers in eco-driving contributes not only to what would be primarily perceived as improving environmental performance, but also results in cost reduction, contributing also to the economic performance (Slaper & Hall, 2011; Shaharudin et al., 2014) and reducing pollution contributing to the social dimension through improving the quality of life of inhabitants (Gimenez et al., 2012). Such decisions can also have a positive impact on social issues (ibid) such as more paid holidays which could in return increase productivity. All the previous as a whole have a positive impact when there is a balanced dynamic between all three dimensions of the TBL leading to a sound company image which may have an indirect impact on sales, thus on economic performance (ibid). However, it is not uncommon to find that trade-offs need to be considered (Fiksel et al., 2014; Coffman & Umemoto, 2010) due to conflicting stakeholder interests (Elkington, 1997; Henriques & Richardson, 2013; Epstein & Buhovac, 2014). Epstein & Buhovac (2014) argue that these challenges are both sustainable and competitive, since social initiatives may increase production costs (Gimenez et al., 2012) and environmental endeavors may require economic investments (Fiksel et al., 2014).
Causes for trade-offs and how to succeed in balancing the TBL

The three aspects of the TBL incorporate social and environmental aspect, but the core aspect for a business is to sustain is the economic sustainability which is a priority, thus aiming for productivity and profitability (Hovorka et al., 2012). Costs are typically the central dimension, even when discussing environmental or social initiatives (Henriques & Richardson, 2013). Sarkis et al. (2010) point out that managers assess impacts when studying environmental projects, in terms of cost, tax cuts and other charges that may be involved (Henriques & Richardson, 2013). Gunasekaran et al. (2015) argue that in order to aspire to balancing all three dimensions, managers must avoid making the mistake of focusing on the short-term results of any initiatives they undertake. Hence, long-term analyses are essential to achieving sustainability in all aspects of the TBL (Dyllick & Hockerts, 2002). Interestingly, a study carried out by Epstein & Buhovac (2014) on over a hundred companies has shown that those who experience attention and pressure from stakeholders are more likely to invest in all aspects of the TBL, hence seeking to balance it (ibid).

Furthermore, the authors argue that for organizations to find out if they are succeeding, the most effective solution is to constantly follow-up through control systems (IT) and carry out frequent reports. However, since the issue of balancing the TBL is in early stages of development and that seriously considering drastic changes especially in terms of environmental and social sustainability, there is a great need for developing effective performance measurement tools and models for simultaneously keeping managing all three aspects of the TBL together (Slaper & Hall, 2011; Gross, 2015). Finally, as discussed previously in the common acceptance of the definition of sustainability, another major reason for the lack of tools and models for performance measurement is the persisting lack of commonly accepted standards and procedures in terms of social and environmental sustainability measurement as well as the difficulty of measuring these in monetary value (Slaper & Hall, 2011; Henriques & Richardson, 2013; Epstein & Buhovac 2014).
3.2 Drivers of SLML

Since sustainability and TBL in LML of companies are not yet a commonplace (McKinnon et al., 2010), there is relatively limited literature in the field of SLML, let alone more specifically in the FRI, thus providing particular relevance to this research topic. However, general theory and empirical data on sustainable practices LML and on the main drivers of such operations have been developed in the recent years (Mann et al., 2010; Grant et al., 2015). The following section presents in limited detail the different factors that could possibly influence companies to redesign their logistics operations (including the last mile part) in a more sustainable manner, according to findings in preliminary literature review. Since the scope of this study is limited to food retailers’ LML in urban areas experiencing many of the issues, it would thus be appropriate to focus solely on the final part of logistics (LML: warehouse to store) rather than long distance haulage. The different drivers of sustainable LML (or city logistics) that are believed to be most relevant according to studies and empirical data collected by various researchers are presented hereafter.

3.2.1 Regulating policies

Some companies implement sustainable logistic practices, mostly to cope with government and local regulations (McKinnon et al., 2010). On the other hand, various urban freight transport initiatives have been implemented in several countries that stress the importance of making LML sustainable in regard to all three dimensions of the TBL. Europe's major capitals have already implemented the environmental zones (EZ) in their city centers that prohibits the use of certain vehicles in city centers - vehicles of a certain age, vehicles that fail to meet standards in terms of emissions and banning lorries at certain hours of the day amongst others because of their many negative impacts of the society and the environment (Harris, Euronews, 2017). These measures are being implemented in many European cities where air pollution causes health problems leading to an abnormally high rate of deaths each year (in cities such as Paris, London, Munich, Turin, etc.) (ibid). Additionally, some urban consolidation centers were created in order to reduce the number of vehicles operating in cities (Benjelloun, 2008). Joint working between
private and public sectors to reduce the pollution caused by classic fuel-run vehicles is still under development, and only “green cities” are managing to mitigate these issues by implementing non-road modes such as freight-trams in Amsterdam and Dresden (McKinnon et al., 2010).

**Figure 3.2:** Spectrum of investigated urban freight measures

**Source:** Ruesch et al, 2010.

On the one hand, the authorities must provide sustainable framework conditions for urban freight transport, and this can be carried out using the method in *Figure 5, urban freight measures*. The measures taken by the authorities could take different forms and aspects such as *economic incentives* (heavy vehicle fee, road pricing, start up financing of innovation transportations), *regulating policies* (night time delivery, emission standards, access restriction), *organizational* (transport management & access licenses), *technological* (transport management systems, trip and route
planning), cooperative (monitoring), educating (eco-drive & promotion of best practices) and infrastructural (delivery lanes and loading zones).

On the other hand, there is a strong need for the private actors to willingly enhance practices in terms of SLML in order to optimize their operations in the long-term and to collaborate with other stakeholders (Ruesch et al., 2010). The author argues that it is of paramount importance that those measures are understood and universally accepted for an effective and flawless urban freight transport to be possible. According to Ruesch’s empirical study on Swiss urban freight transport measures, private and public sectors accepted most of the measures (see figure 5 hereinabove). Disagreements were encountered regarding access restrictions, separate loading and unloading lanes, loosening of night driving restrictions and on increased vehicle fees (ibid).

The outcome of these measures by both private and public actors were: a stronger involvement of private actors in freight transport planning; improved data collection for urban freight transport; better monitoring and control strategies; and promotion of best practices (Ruesch et al., 2010).

Indeed, the measures taken by the government such as road pricing or night time delivery amongst others have been implemented in some urban areas aiming to reduce GHG emissions (McKinnon et al., 2010). The author also states that by imposing taxes on polluting vehicles, by providing financial incentives for investing in sustainable transport methods and by regulating vehicles and operations, local and national authorities are acting for sustainable logistics. However, those measures are still limited in operations and results in most of the industrialized countries of the world, and most LML operations need to be enhanced from an environmental and social perspective (McKinnon et al., 2010) and balanced with the economic dimension as stated previously.
3.2.2 Innovative technology

The use of EFV to supply retailers in city centers is a possible and plausible solution for reducing GHG emissions in urban areas and is often referred to as “green transportation” (Quak et al. 2016). It is commonly acknowledged as a measure linked to the environmental aspect of the TBL, although it has a great number of economic (e.g. cheaper energy) and social (e.g. noise and air quality for breathing) benefits. The use of EFV for LML purposes is thus a relevant solution to overcome urban air pollution as well as negative externalities for the environment and for the population, for which LML transportation has its part of responsibility (ibid). The use of EFV thus possesses its many advantages from a company’s perspective (cost reduction through energy efficiency, improved image, taxes, insurance, etc.) and for the society - less nuisance, less pollution and congestion (Quak et al., 2016). The author also claims that there are very few companies that truly use EFV in their city logistic operations, and that the four main reasons that keep companies from using more sustainable vehicles are:

- The limited range of EFV on the market in addition with their low capacity and longer charging time (although this is improving).
- The high initial cost of changing to EFV fleet compared to conventional vehicles.
- The fear of fast technological change that will make EFVs obsolete in regard to the investment required.
- Lack of willingness of the entrepreneurs to invest in sustainable logistic solutions.

Other types of improved sustainable delivery vehicles used in LML nowadays, although they may be less popular include, hybrid vehicles, delivery tramways and hydrogen vehicles amongst others which help achieve all goals of the TBL. However, by redesigning the operations, with increased government regulations and/or incentives for investing in EFV, and by promoting more successful cases of EFV implementation, many more companies could consider using EFV for theirs LML operations (McKinnon et al., 2010). Moreover, innovation in technology of vehicles is likely to be developed in the coming 20 years, with the increased use of clean and environmental-friendly kinds of transportation (ibid). Improvement of
engines, regarding energy efficiency is already under development (Quak et al., 2016). The application of hybrid technology on delivery vans can improve fuel efficiency by at least 50%, by combining (bio)diesel and battery power for local transportation (McKinnon et al., 2010).

Use of alternative fuel for delivery vehicles can also promote the sustainability of the LML process that would reduce the total GHG emissions, nuisance and other environmental and social impacts (ibid). Alternative fuel vehicle use follows the sustainable development perspective with major economic, social and environmental benefits, although their operationalization is subjected to some economic criteria such as prices, related services and benefits, maintenance and access (Chang et al., 2015). Alternative Fuel Vehicles (AFV) are increasingly being developed, using biofuels (biodiesel, bioethanol), biogas, hybrid and electric engines, that are more sustainable alternatives to the commonly used diesel (Browne et al., 2012), although they imply certain drawbacks (e.g. palm oil controversy in certain biodiesels).

The hydrogen fuel-cell vehicle is at this stage being tested, or will soon (end-2017) be tested for logistics purposes. Scania will test them in a partnership with Norwegian food retailer Asko (Scania Group, 2016), and UPS will be testing them in Sacramento (USA) later in 2017 (Ayre, 2017). Compared to the EFV (electric), one of its major advantages for businesses is the “refueling time” of just a few minutes which is one of the major issues with purely electric vehicles that require much more time at this stage of its development.

Other innovative technology that is being implemented with more familiarity is the incorporation of IT systems in the logistic operations and more precisely in the transport processes (Pamucar, 2016). The same author claims that routing models for individual follow-ups are used to reduce consumption (eco-driving) and to minimize the traveling distance. The Transportation Spatial Decision System (TSDS) defines the green capacity of the routes to minimize energy consumption, avoid congestion (negative social externalities) and to increase the performance of freight transport (Pamucar, 2016). Moreover, with an integrated IT system, the sharing of the large amount of information between business partners in the supply chain brings
efficiency and profitability to the involved parties, by leaning and clearing the logistic processes flows (Leung et al., 2012).

3.2.3 Reducing GHG emissions and energy efficiency through internal and external incentives

Meeting the regulations on the reduction of GHG emissions has been one the businesses priorities in some countries (United Nations/Sustainable Development Goals, 2016). In Sweden, certain food retailers as well as other firms have set a goal to reduce the CO2 emissions of all their operations by 2030 (Coop 2012 annual report). Some companies are not just focusing on meeting the government regulations but are going further in their sustainability initiatives, by reaching even greater reductions of CO2 emissions: German industrial conglomerate Siemens, and Information Technology giant Cisco Systems that were both ranked top in the world most sustainable companies in 2017, thanks to their low carbon footprint and their energy efficient operations (Kauflin, Forbes Magazine, 2017.)

Replying to financial incentives can drive food retailers to rethink their LML practices and to shift towards more sustainable practices (Tang et al., 2012). The European Commission has projects aiming to help companies reduce their GHG emissions, the Marco Polo programme which has been implemented since 2003 (European Commission/Transports - Marco Polo Program). The program provides financial, managerial and technical incentives to companies that are mainly operating in logistics meant to reduce the environmental impact of transportation (ibid). The program promotes a less polluting modal split to avoid road congestion and pollution (ibid).

By increased energy savings, leaner and cleaner transportation modes, and the two most concerning and difficult-to-achieve aspects of the TBL can be reached, with reduced operating costs due to more fuel-efficient vehicles (equally fulfilling the economic dimension).
3.2.4 Evolving Business Models for an Enhanced Brand Image

Re-designing the company’s operations using the TBL approach will not only conceal financial performance with environmental and social objectives, but will also improve the brand image of the company as perceived by the society so that consumers and suppliers will be likely to choose the firm’s products or services over a competitor’s that does not demonstrate consideration for social and environmental issues (Markham et al., 2014).

However, due to cases of corporate misconduct, scandals and greenwashing practices of companies, citizens and consumers may be skeptical towards the truthfulness of the various sustainability initiatives companies claim to care for or invest in, since false or only partially truthful sustainable practices are often dragged out in Sustainability and CSR Reports (Rahman, 2015). This may therefore lead consumers to lose faith in companies’ claims of operating in a sustainable manner. Furthermore, an increase in food retailers’ concern for sustainable LML to fix/enhance brand image would call for competitors to do the same, because of the significant leverage they possess due to the changing market conditions and consumer demands (Ganesan et al., 2009). An improved brand image often comes along with economic advantages, and thus is an important aspect to consider for the top management, concealing environmental and social consciousness with economic performance (Werther & Chandler, 2005).

3.2.5 Stakeholder Pressure

Although various stakeholders may not possess direct power to create change within a company, they do have the ability to create pressure that influence a company’s practices and philosophy (Zhu et al., 2005; Gonzalez-Benito & Gonzalez-Benito, 2006; Wolf, 2013). Public opinion has a great influence in the FRI, and the slightest scandal could cost a company a great deal of their reputation (Gotsi & Wilson, 2001), which is why external stakeholder pressure can shape corporate decisions (Zhu & Sarkis, 2006). Internally, employees and mid-level managers equally have an important role to play in shaping top management in a way that it results in them
being displaying a proactive strategy, all through a sort of domino effect (Sarkis et al., 2010). Furthermore, Delmas (2001) has claimed the benefits for competitive advantage of external stakeholder pressure (customers, communities, regulatory organizations etc.). In the recent years, there has been a succession of articles and studies in SSCM in this regard such as on the electronics industry (e.g. Wittstruck & Teuteberg, 2012) and in the automotive industry (e.g. Beske et al., 2008), studies in this regard in the FRI remains scarce.

3.2.6 Proactive Management Approach towards Sustainability

Adopting the TBL approach to a company's LML operations generally requires a set of bold decisions by top management for cleaner and leaner practices (Rebelo et al., 2016). Therefore, the author claims that making the operations sustainable entails amending ways a company works with its suppliers, performs, produces, purchases and operates. These decisions and changes represent long-term perspectives for the firm (ibid). According to Lichtenthaler (2005), knowledge is required to adopt new technologies and to apply new processes, and it is far from being an easy task for every company to shift towards new and more sustainable operations, which is why in that sense a proactive management team would provide higher chances of achieving these goals. Buysse & Verbeke (2003) claim that proactive leadership is not linked with an increasing importance of social/environmental regulations, thus suggesting that it would be rather linked to voluntary cooperation between companies and government, and that country specifics have a larger effect than expected on such outcomes. Literature that focuses on social and environmental issues most often distinguish compliance-driven companies (firms that aim to meet the minimum legal requirements) from those that are proactive, thereby considering driving forces other than the government (Schot & Fischer, 1993). Several authors claim that companies that include social and environmental issues into their priorities (and not only economic issues - profit) could be seen as a way to enhance a firm’s alignment with the concerns and expectations of its stakeholders (Gladwin, 1993; Steadman et al., 1995; Garrod, 1997). Henriques and Sadorsky (1996, 1999) have shown through a study that beyond government regulations, it is the customers, shareholders and communities that primarily affect management practices, especially
in terms of social and environmental initiatives, supported by Buysse & Verbeke (2003), as in the case of Axfood which will further elaborated. Endogenous factors, such as the company's desired image, organizational culture, resource allocation, etc. may thus drive or prevent a firm from opting for more sustainable practices (Lichtenthaler, 2005).

Hence, again, proactive management is a key element to enable a successful implementation of the TBL approach (McKinnon et al., 2010), which naturally affects practices in a company’s LML.

According to van der Vorst et al. (2013), there are three main approaches followed by the top management in regard to sustainability practices. The first one is the compliance oriented strategy (Buysse & Verbeke, 2003) that focuses on following the government regulations and policies regarding sustainability, and is considered as a reactive approach towards sustainability. Secondly, companies operating in logistics could choose the process-oriented (proactive) strategy that aims at achieving process improvements following the TBL approach. Thirdly, the market-oriented approach takes into consideration all the aspects of sustainability if it leads to a competitive advantage.

Proactive management in terms of sustainability can be seen as a voluntary practice that goes beyond the regulatory requirements regarding environmental and social issues that ranges from companies that slightly exceed the legal requirements to companies that are leaders in sustainable practices, lobbying in order to enhance their sustainability-oriented practices (Aragon-Correra et al., 2007). The author states that only a few companies in the FRI have the power and the willingness to excel in sustainability, and that in most cases, retailers only fulfill the minimum requirements imposed by stakeholders.
3.3 Summary of SLML Drivers

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**Table 3.1:** Drivers of SLML operations according to literature review

**Source:** Own creation.

Although this table only gathers a certain portion of literature available on these matters, this may give a rough overview of what is mainly mentioned and discussed by researchers. By looking at this table, it is quite clear that there is an emphasis on
elements that relative to characteristics of proactive management, stakeholder pressure, innovative technology and financial aspects.

First, a proactive top management as an internal driver is often discussed and analyzed as an important aspect. The use of innovative technology as a driver of sustainability is also cited in a great number of academic and research articles and publications. Regarding the cost reduction benefits that implies a shift to more SLML operations, many authors agree on its relevance for food retailers, since margins within the logistic sector are very low, the economic factor such as cost optimization often outweigh environmental issues (Wichmann et al., 2015). Regulating policies as drivers of sustainability in the LML operations are slightly less mentioned in theory. Financial incentives according to previous literature may have an impact on decisions for initiatives, since it contributes to the economic dimension which will then help management to determine whether an initiative is economically feasible.
This chapter is divided in two parts. The first part deals with the presentation of the studied food retailer and its sustainable practices collected from secondary data sources such as annual reports and company related articles. The second part explains the main findings according to the semi-structured interview and observations with the food retailer regarding the sustainability-oriented practices. Any hints to analyses are only a result of the semi-structured method of interview.

4 Empirical findings

4.1 Overview of the firm

The information hereinafter is exclusively from Axfood’s company webpage and annual reports. Axfood is the second most important actor in the Swedish FRI with 21% of market share (Axfood webpage, 2017). They claim a corporate identity that goes hand in hand with sustainable development, emphasizing efforts to mitigate social and environmental issues in addition to their economic sustainability. They possess two wholly owned grocery store chains (Willy’s and Hemköp). Dagab works as a support company for the group's purchasing and logistic operations. Transports are steered by either the producer or by Axfood, depending on the product and agreements with the suppliers.

The company operates stores across several formats. Apart from the soft discounter chain Willy’s, the company operates the traditional grocery chain, Hemköp. Axfood Närlivs (convenience store wholesaler) is also owned by Axfood but irrelevant since they are located outside of city centers. Axfood also runs the food retail logistics company, Dagab. This indicates that the company has access to a large and diverse customer base.

Axfood/Dagab owns four warehouses, with two full-range warehouses in Stockholm and Gothenburg and two additional warehouses located in Borlänge and Jönköping.
The general rising concern for sustainability issues within the FRI explains the common practice of publishing of CSR reports, and/or annual reports with a specific focus given to “best sustainable practices.” According to the secondary data collected from Axfood’s 2016 annual report, a range of practices enhancing sustainability in their LML operations include:

- Financial bonus system incentive for truck drivers to reduce their fuel use is implemented (eco-driving & education).
- The company focuses on efficiency in loading and works on reducing empty running.
- Transportation process uses route planning, eco-driving practices and trucks running with renewable fuels (HVO) and other sorts of follow-ups.

Moreover, Axfood’s support company for logistics and purchasing, Dagab also strives for sustainable best practices. Dagab is owned by the Axfood Company, and decisions regarding their logistics support company are made by the Axfood company themselves:
Axfood operations are challenged to be climate-neutral by 2020.
Investment in solar panels on warehouse and store rooftops is planned.
Use of HVO (renewable fuel) has led to a reduction of 49% carbon footprint in one year.
During 2017, Dagab will integrate its warehousing of fruits and vegetables, launch a partly automated warehouse for perishables in Jönköping, undertake further efficiency improvements in transports and continue to improve the assortment, which will also involve developing private label products and business.

4.2 Axfood´s SLML operations

As stated previously, Axfood owns more than 260 grocery stores across Sweden, and many of them are located in urban areas and next to city centers. Their LML operations are obsessed with sustainability issues and environmental concerns. The empirical data collected through the interview with Åsa Domeij, Axfood´s Head of Environment and Social Responsibility provided us with relevant insight on the company's practices in SLML operations. She is a veteran regarding social and environmental challenges, and has been a Swedish MP representing the Swedish Green Party from 1988 until 1991 and from 2002 until 2006, and became Axfood’s Head of Environment and Social Responsibility in 2008.

To find answers to the first research question and to understand the way Axfood operates, questions were asked about the different means of transportation used for the LML operations, how they are more sustainable as well as the persisting issues regarding making their practices constantly more sustainable.

4.2.1 Methods of Transportation

According to the data collected through the interview and follow up questions, regarding Axfood’s LML operations and its transportation means, mostly HVO (hydrogenated vegetable oil) fuel is used, which is a type of biofuel, renewable
energy source that is more sustainable than the classic diesel typically used in transportation logistics. The company purchases this fuel from the Finnish oil refining company Neste that commercializes PFDA (Palm Oil fuel) as an HVO. However, the biodiesel used contains palm oil, which poses a particular issue, because even though it is a renewable and cheaper alternative energy source, its production contributes to the massive deforestation involving oil palm plantations and forests in Southeast Asia, South America and Africa. Moreover, increasing consumer and media pressure against the consumption of palm oil questions the sustainability aspect of this alternative fuel.

Fuels containing palm oil being environmentally damaging, the company will go back to the use of traditional diesel to pressure Neste and is confident that a solution will be encountered in the coming year. Axfood tends to diversify its fleet as much as possible in order to find the most economic and less harmful solutions, from an environmental and social perspective for their transportation means.

There is no use of EFVs now for their logistic operations (investments pose a high risk), although they believe investments will be made in the near future. Hydrogen fuel and hydro gas they believe will be the next technology in which they will invest, which would make them the first food retailer in Sweden to use this type of vehicle, through a partnership with Volvo, Swedish company developing this technology. Again, diversifying their fleet is thus seen by them as the most sustainable way of achieving best sustainable practices, because this mitigates investment risk since new technology has not been tested long enough to know if it can be reliable on the long term, thus considering economic sustainability.

Axfood has improved its energy savings in their LML operations and have greatly reduced their GHG emissions in the past few years, thanks to eco-driving, driver training, biodiesel and a fleet management system amongst others.

Fleet management systems benefit both social and environmental aspects in Axfood’s LML. It helps reduce fuel consumption through more ecological driving habits and guides drivers in the route choices to avoid traffic or congested areas. Lorry drivers are also frequently followed up to avoid accidents due to fatigue/burnout for instance. They have also adopted the ISO 9000 standard which
provides quality management and quality assurance and ISO 14001 which is adopted by companies that strive to manage at best their environmental responsibilities. The use of HVO vehicles has more than halved CO2 emissions in their LML operations. The fleet management system allows a follow-up of each vehicle individually (exact fuel consumption, itinerary, driver behavior) and produces cost savings for the company and benefits for the environment. One of the greatest issues however, is to guarantee that the fleet will be reliable to last the company a minimum of 10 years, thus the issue of fulfilling economic sustainability. A solution, according to Axfood would be the possibility to lease/rent these new vehicles, which would mitigate this concern.

4.2.2 Emphasis on sustainability issues

According to Axfood’s Head of Environment and CSR, Åsa Domeij, the use of a diversified fleet for the LML operations is beneficial in a context where adopting new fleet is not just about renewing the old one, but about adopting new cleaner and more efficient technology that has at this point not been tested on the long term for its durability. Especially in the transportation function, the most concerning aspect in the eyes of the society that needs to be tackled is the environmental factor, and social issues are also a result of it. The use of alternative fuels and energy sources, such as biofuel, hydrogen gas or electric vehicles would all reduce the carbon footprint dramatically, reduce nuisance, air pollution, congestions etc. and provide an alternative solution for the transportation function to tackle one of the major issues in city centers which is polluted, unhealthy air. This would also mitigate social issues regarding the working conditions of the employees involved in LML. Alternatives fuels/energies provide various benefits such as more silent vehicles (hydro gas and electric vehicles), that could allow night time deliveries that would reduce congestion and pollution in city centers, and improve the working conditions of lorry drivers and living conditions in the city. The social issues are also tackled by a better management of employees (particularly the drivers), improved working conditions and training/monitoring. However, this factor can be seen as only partial in the transportation function, though it’s of paramount importance in the purchasing function, as claimed by the interviewee.
For more sustainable transportation means, better autonomy of the electric vehicles would be necessary to assure long distance driving without the issues of battery recharge time. More arguments should be presented in order to push companies to switch to the use of electric vehicles. According to the interviewee, the government has an important role in providing the right incentives to create faster and more effective change. Political pressure is therefore necessary and Axfood works with lobbying organizations that battle for progress to mitigate these issues.

On the other hand, the role of the top management team is paramount in promoting more sustainable practices. Personally engaged personnel and sustainability focused education of the employees through e-learning for instance have a long-term positive impact on how the company deals and tackles sustainability issues. Employees can provide recommendations and new innovative ideas that can be adopted on many levels of the company.

In terms of environmental and social sustainability, Axfood goes beyond the national and European laws and requirements, and sets an example for other actors in the industry by reducing its GHG emissions in all its operations, by participating in the CO2-free Sweden challenge by 2030, by putting an emphasis on employee training and branding and by promoting with great engagement its sustainable corporate culture. In such terms, Axfood adopts a market oriented approach of proactive management (van der Vorst et al., 2013) that takes into consideration all the aspects of sustainability in their operations.

4.2.3 Cost Savings and Trade-offs

Data has shown that in the case of Axfood, trade-offs are considered for the achievement of long-term sustainability goals. This can be illustrated through the issue that Axfood is facing with the biodiesel used as energy source for lorries in LML. The price of fossil fuels has been rising, and the price of biodiesel is becoming more competitive also thanks to tax cuts (2016) in Sweden (Kauppila, 2016). Biodiesel also has mechanical benefits (e.g. reducing maintenance costs). However, Axfood is looking to temporarily switch back to classic diesel, due to the controversy involving the production of palm oil in third-world countries. This will most
probably mean higher short-term costs for the company, a higher short-term negative environmental impact. Doing this means, as a large industry actor, pressuring the biodiesel supplier (Neste) to resolve this issue, to which in their vision will lead to a positive long-term outcome. When asked about the cost savings of adopting a new fleet of hydrogen gas lorries, the answer was that Axfood really doesn’t know the detail of what they will be saving in terms of cost. At this point they have ideas of possible scenarios that would create new opportunities for cost savings such as night time deliveries, the cheaper alternative energy/fuel, an increased amount of deliveries in less time, possible reduced cost of new technology maintenance, etc. However, they appear to have a larger consideration for the long-term social and environmental benefits that this technology will have for the company, which may be greater than the cost savings, and possibly open new opportunities for growth.
This chapter analyzes the findings of the primary data collected through the interview and observation of Axfood. The various driving forces of sustainable LML practices will be analyzed by juxtaposing primary and secondary data.

5 Case Study Analysis

The case study about Axfood’s SLML operations will be based on the primary data collected through the interview, email discussions and (secondary data from) the company's social responsibility report in order to answer the research questions of this study. The findings will be compared to the theoretical framework taken from previous literature on the topic of SLML operations. The comparison will shape the explanation building of the different driving forces of LML operations following the TBL approach in the Swedish FRI.

5.1 Axfood’s sustainable LML driving forces

The interview and email discussions provided relevant insight on the driving forces that shapes the sustainable practices in the company’s LML regarding the TBL, presented hereafter.

5.1.1 Regulating Policies

Meeting the government and European requirements in terms of GHG emissions goes far beyond being fulfilled. Axfood is already leaving a smaller carbon footprint than the national and European regulations require and many of its competitors. Hence, a proactive management plays a key role in excelling in sustainability performance (Aragon-Correra et al., 2007), since the company does better than what is required by the local and European authorities.

The importance given to achieving a balance of the TBL by top management and especially the main shareholder of the company (who owns 51%) is considerable and
thus the results can be seen in the practices and initiatives taken regarding environment and social issues whilst remaining economically sound. Investments in AFVs amongst others to reduce the company's overall carbon footprint are of great importance, and are one of their strengths regarding their leading position in sustainable practices in the industry. Axfood’s main shareholder and decision makers strive to overcome social and environmental sustainability issues, and are highly receptive of external pressures from the government, the media, the customers and NGOs, since their goal is to constantly implement the best possible sustainability practices, in all its operations. Axfood thus follows a market oriented approach that aims at considering all the aspects of sustainability to lead the company to a competitive advantage, while responding to social and environmental demands (van der Vorst, 2013).

5.1.2 Innovative Technology

On the other hand, improved operations efficiency by the implementation of leaner modern technology may be perceived as an incentive to shift towards more sustainable means of transportation. Innovative technologies usually possess characteristics that go hand in hand with mitigating sustainability issues. As Rao et al. (2005) claim, the goal, from a retailer perspective, is to reduce the operating costs and increase the level of services in order to remain competitive. Åsa Domeij confirmed that the use of technology such as fleet management systems. These systems largely optimize operations by reducing energy costs (fuel savings) but also mitigate social issues because these systems provide information on average speed (reducing risk of accidents from irresponsible driving behavior), lorry driver working hours (to assure they respect breaks and work reasonable hours), safety regarding mechanical and physical deficiencies on the lorries, etc. Although innovative technology has its advantages, there can be several drawbacks, as seen with the palm oil controversy. Locally, this may have benefits for the environment, but on a larger scale, according to major NGOs, it has given birth to large negative social and environmental issues. However, measures are taken by Axfood to constantly bring in any sort of new technology that may be positive environmentally and economically, as argued in previous literature (McKinnon et al., 2010; Leung et al., 2012; Chang et
al., 2015) such as electric/hydrogen gas lorries that pollute less, solar panels on warehouses, and socially (Chang et al., 2015; Pamucar, 2016) such as fleet management systems, provide truck driver follow-up. Innovative technology is thus a driver that has the ability to provide benefits for all three dimensions of the TBL, making it a highly valuable driver in this regard.

5.1.3 Financial Incentives and Cost Benefits

According to the Head of Environment and CSR, economic drivers are not the main drivers of sustainability in the company's practices and operations. Even though the financial side of sustainable operations cannot be left aside, investments in clean innovative technology (e.g. vehicles) and fleet management systems are necessary to reach the sustainability goals set by the top management. Nonetheless, investments such as for electric vehicles are still on hold since the company must ensure economic sustainability. As Whiting & Bennett (2001) argue, “no company can survive to continue its efforts toward sustainability if it does not also exercise sound business judgment. Sustainability must also sustain the company. Hence, short-term objectives must not be neglected, since failure to meet those would compromise achieving the long-term goals. As argued by Gevaers et al. (2011), city center located retailers usually control and monitor the LML operations, which is often the most expensive, least efficient and most polluting part of the transportation in the supply chain. According to Åsa Domeij, although the economic factor remains essential and is something to be considered prior to deciding on an investment, the company is very committed to positive change as long as the company is aware that it will have overall long-term benefits (especially social and environmental) and that it will not compromise economic sustainability.

Financial incentives in form of taxation or subsidy of clean energies by the government can also have an impact on the decision of making investments in modern technology and AFVs. Axfood along with other organizations lobby for laws and regulations to provide more incentives for the development of alternative energy and innovative technology, and to subsidize and support the companies that make investments of high economic risk.
Therefore, incentives and cost benefits in terms of elements such as tax, subsidies, risk insurance, etc. may have an impact on a food retailer’s decision-making and facilitate it or help for sustainability-oriented decisions to go through faster. An example within Axfood is the fact they do not invest in electric lorries for LML due to the risk but also because of other disadvantages of this technology. Instead, they estimate that they may wait for more sustainable technology such as hydrogen gas vehicles. Hence, financial incentives, although they may partially impact sustainable practices do not appear to be crucial or most determining of the direction taken by top management.

5.1.4 Evolving Business Models

Over the past 15-20 years, the Swedish society has become increasingly aware of important environmental and social issues locally and abroad and have generally become more responsible in these regards as citizens, which is reflected by recent decisions made by the government such as aiming to phase out all GHG emissions by 2045. According to Åsa Domeij’s (Head of Environment and Social Responsibility of Axfood) statements, Axfood does not simply satisfy themselves by complying with measures taken by authorities, but lobbies to accelerate the process and make bigger improvements in terms of sustainability. Their business model promotes environmental and social initiatives not only within the company, but also in their suppliers’ practices in these regards, ensuring that no irresponsible social or environmental trade-offs are made for higher economic returns. This driver is also strengthened by fostering employer/ee branding as stated by Åsa Domeij, which empowers the organization and ensures that the values and goals of the top management are shared and promoted by those working at other levels (operational) resulting in additional innovation with their workforce. Many times, scandals of false sustainability claims have emerged (Rahman, 2015). By regularly providing CSR reports and displaying efforts towards the environment whilst equally producing economic returns, as well as open communication with stakeholders (society, consumers, employees, etc.), there is a better sense of transparency that foster customer loyalty and confidence between the various parties. Furthermore, according to a study, the organizational structure does not have a great influence on innovation.
in the case of Swedish food retailers (Chkanikova et al., 2013), which more largely depends, as equally stated by Åsa Domeij, oftentimes depends on the creativity and engagement of the employees themselves on all levels to have their ideas implemented.

5.1.5 **Stakeholder Pressure**

Moreover, external social drivers such as customer requirements, pressure from the media and NGOs are also considered and are factors that pushed the company to adopt more sustainable practices, including its LML operations. Reducing congestion, noise and air pollution in city centers are only a few of Axfood objectives that will in the future invest in clean technologies for their LML operations (EFVs, hydrogen gas delivery vans, etc.).

Thus, the main elements that pull the company to adopt more sustainable LML operations, are on one hand the employee training and education (seminars, e-learning) that constitutes internal social drivers and on the other hand, the external social drivers such as the media, the customers and NGO’s pressure and criticism have a real impact on the sustainability of the operations. Boycotts of customer conveyed by a deteriorated brand image could lead to loss in market share and profitability (Bowen, 2000).

5.1.6 **Proactive Management & Ownership**

Profit is naturally the main concern and purpose of a business. With the rising pressure from NGOs, government policies, and other stakeholder aforementioned thus force companies to change their practices and display efforts in terms of sustainability. However, efforts remain insufficient, policies are often not strict and ambitious enough to mitigate environmental and social issues and make them evolve along with economic ambitions, and thus industry leaders play a significant role in this regard. Therefore, due to ownership, it is not uncommon to find that trade-offs need to be considered (Fiksel et al., 2014; Coffman & Umemoto, 2010) due to conflicting stakeholder interests (Elkington, 1997; Henriches & Richardson, 2013; Epstein & Buhovac, 2014) and leadership of a company can thus, as is in the case of
Axfood be a crucial factor for the achievement of such goals. The case of Axfood demonstrates that if ownership stresses the importance of mitigating sustainability issues, naturally this philosophy will be common across top management, hence spreading throughout the other hierarchical layers of the company. This does not imply that executive power must absolutely be held by one party to be sustainable. However, in the case of Axfood, it proves to be exerting an enormous impact since the philosophy of the party holding a great deal of power aims to achieve a long-term balance of all three dimensions of the TBL. This joins Willard’s (2012) statement that change will be more effective if done through organizations “that are large enough and powerful enough. Without their support, restoring natural systems and healing social inequities takes longer and may be impossible.”. Proactive corporate ownership and proactive top management in the case has thus proven to be a very strong driver for achieving sustainability, and more specifically more sustainable LML practices.

5.2 Findings linked to RQ1

By taking the perspective a major actor and sustainability leading company in the Swedish FRI; this study has shown the different aspects of the LML operations in terms of sustainability. To do so, Axfood operates its LML by implementing more sustainable practices for LML transportation through:

AFVs to reduce emissions, with the implementation of HVO fueled vehicles that represent a cheaper and renewable alternative to the classic diesel delivery vehicles. Due to the controversy affecting biodiesel, Axfood may temporarily opt for regular diesel again. This proves that they alone do not have the power to achieve best sustainability practices on their own, but that it also partially depends on government regulations and measures to mitigate certain barriers. Furthermore, they focus on long-term results and achieving long-term sustainability, which is why they look forward to a partnership with Volvo for hydrogen gas vehicles to operate their LML in a much more sustainable manner: CO2-free deliveries; reduction of congestion; nuisance and accidents in cities because night-time deliveries could take place;
highly improved working conditions for lorry drivers (empty roads); high long-term cost reduction (cheaper energy, time efficiency though shorter delivery times, etc.). Therefore, this solution will undeniably mitigate social and environmental issues and enhance economic performance.

A few of the measures include:

- A special focus on diversifying their fleet for less vulnerability and more flexibility towards market evolutions by investing in hydro gas vehicles in the coming year and probably in EFV in the near future. Although a common fleet has its advantages, fleet diversity may be preferable when investing in new technology due to the risk of design flaws.
- Innovative technology such as fleet management systems and eco-driving, education and training of its workforce to improve energy savings, and the optimization of delivery vans loading.
- Importantly lobbying with other organizations to pressure the national authorities to reform laws and regulations which may help companies in their shift to making operations consistently more sustainable.

These measures taken by Axfood present important as well as complex changes in the LML process and therefore need to be considered by the top management before their implementation. They also require important set of resources in terms of investment in new vehicles and technology, and consequently, the returns on these investments should be secured. One of the ways to achieve this is through adequate government regulations that aim for a shift towards best sustainable practices, ensuring that companies such as Axfood that invest in such initiatives do not lose their competitive edge and compromise economic sustainability, somehow pushing others, less proactive companies in this regard to follow the trend.

5.3 Findings linked to RQ2

The study has shown that economic drivers are a necessity for implementing SLML. The economic drivers for food retailers that aim for best sustainable practices remain
important for the achievement of long-term social and environmental goals (Labuschagne et al., 2005; Mihalic et al., 2012; Mota et al., 2014). Without the drivers of this nature, achieving social and environmental sustainability would be impossible, because these would compromise the company’s financial health.

Moreover, great importance is given to the social factor since; sustainability within the company is conveyed by a particularly engaged personnel and management team, as well as by the external pressure from the civil society, the media and NGOs. The brand image and CSR of the food retailer also plays a significant role in the adoption of more sustainable practices in the LML process. Improving the working conditions of the workforce constitute a relevant factor for energy savings (for truck drivers that are incentivized by bonuses on fuel consumption efficiency), and in the same time lowers the negative externalities by decreasing pollution and avoiding congestions in city centers (Gimenez et al., 2012; Cho et al., 2014).

The environmental factor, however appeared to be the one most focused on, and the most challenging one for achieving a balance the TBL dimensions although social issues also remained a key priority. Regarding LML in particular, environmental issues appear to be the most challenging issue for the company to overcome, because they do not have full power (i.e. responsibility of government, suppliers, and other stakeholders that influence and may set obstacles in the achievement of best sustainable practices). According to McKinnon et al. (2010) companies were mostly incorporating the environmental factor in their operations to cope with government regulations, which was not the case of Axfood that outperformed the authorities’ requirements regarding social and environmental objectives, constantly lobbying for stricter regulations and incentives for sustainability-oriented investments and initiatives. Corporate culture, proactive management, external environment/stakeholders, resources and goodwill, constitute necessary forces. One particularity of the case studied was the need to analyze the strategy and LML operations of a leader in sustainability initiatives in the FRI, that have given a better understanding on how and why sustainable LML are carried out.
This chapter reflects on the findings and the analysis of the case study. The plausible differences between the driving forces and the actual implementation of sustainable LML will be developed and discussed.

6 Discussion and Critical Reflection

After juxtaposing the preconceived conceptual model (the drivers of sustainability in LML of food retailers based on previous theory), with the empirical findings, we can find discrepancies with the initial model. Therefore, it would be relevant to reflect on the differences between the driving forces and the actual sustainable practices in the LML operations of Axfood.

First of all, stating that a company is driven by environmental and social motivations, belittling the economic aspect would be a blind statement and would be unachievable, and various authors have supported it in their literature (e.g. Erol et al., 2011; Yakovleva, 2012; Mota et al., 2014). The purpose of a food retailer is not primarily to save the environment and to campaign against social inequalities around the world, which would be the main purpose of NGOs such as Greenpeace and Amnesty International. Without fulfilling economic duties, Axfood would be out of business, and would thus not even have the possibility to produce a long-term positive impact on the environment and the society.

Therefore, even a company that is very highly conscious and ambitious to overcome environmental and social issues must first and foremost ensure economic sustainability. However, where the difference may arise when companies are economically sound, is when one simply continues to extract short-term profit, and the other instead decides to inject this financial capacity into innovative technology, material to improve worker conditions and other initiatives that mitigate social and environmental issues, even if this results in lower short-term profit. Focusing on the economic aspects and on profit is thus important for the achievement of social and environmental goals for best sustainable LML practices. The difference lies within how the profit is then used.
Stakeholder pressure with the internet and social media in particular has taken on a whole new dimension over the past two decades. However, the main scandals that arise and that are publicized are those linked to consumer products (Findus in 2013; Mad Cow Disease late 1980s; recurring supermarket food waste scandals; and scandals linked to producers’ working conditions amongst others). However, many would agree that controversial practices within the LML operations of a food retailer are rarely publicized or know of by consumers, since the transportation methods do not directly impact the food or products they consumer as long as their state is not affected. Therefore, it is particularly important for top management to be highly proactive on these issues and for engineers to strive to create leaner, cleaner and more socially and environmentally sustainable technology, mitigate barriers for companies to adopt them.

According to the limited available existing theory on the social drivers of sustainability of the LML operation in the FRI, the social factor may imply an improvement of the urban population’s life by using less polluting and silent vehicles (Gimenez et al., 2012). Furthermore, training and educating the workforce has a great positive long-term effect that contributes to making LML more sustainable (Giebler et al., 2006; Cho et al., 2014). However, trade-offs between costs and the social performance may occasionally be inevitable (Fiksel et al., 2014). This decision of educating and training the employees to the vision of the firm, (best sustainability practices) along with the similar views of stakeholders have proven to be essential in achieving their position of sustainability-leading food retailer. Is appears that additional significance should be given to this factor that highly contributes to the achievement of sustainability goals, and often left aside in previous research, which seems to be very highly interlinked with education in general.

After carrying out this study on the different drivers of sustainability, and analyzing the practices in Axfood’s LML operations, it is undeniable that the impact of corporate culture and top management represent key factors to achieve best sustainability practices. External forces remain relevant although they may not be sufficient to motivate companies operating in the FRI. The weight and balance of the various factors depend on the company and its approach toward sustainability. In the studied case, it seemed that regulating policies and other external environmental
regulations did not have the greatest influence regarding the adoption of SLML practices as cited in previous research (McKinnon et al., 2010). Many companies tend to maintain status quo in their operations and practices regarding environmental and social issues as long as they are not forced to change them, most commonly because economic sustainability does not seem to be threatened (Boiral, 2006). Therefore, exceeding the regulations and having and outstanding record is a sign of quality management and education that are key for reaching sustainability in the LML operations of food retailers and without which the other driving forces would lose a great deal of their significance. It may be fuzzy to imagine what perfectly sustainable LML may be. Constant improvement must be sought, and there may thus never be an end to seeking to improve social, economic and environmental performance.
This chapter sums up the findings and the results of the study by answering the two research questions. The research contribution and limitation of the study will eventually be presented.

7 Conclusion

LML is the most polluting, expensive and inefficient part of logistics (Gevaers et al., 2009; Aized & Srai, 2014). Shaped by rising societal and environmental concerns, the logistic function in the FRI is undergoing drastic changes, and turns towards more sustainable practices and operations. Due to the diverging interests of stakeholders’ (company's shareholders, government, consumers, suppliers, NGOs, etc.), food retailers’ operations may not entirely evolve according to what a food retail company desires but instead affected to a certain extent by other stakeholders involved.

RQ1: How does Axfood, one of Sweden’s largest urban food retailers operate LML through more sustainable methods of transportation?

By taking the perspective a major actor and sustainability leader in the Swedish FRI, this study has shown the different aspects of the LML operations in terms of sustainability. In order to do so, Axfood operates its LML by implementing more sustainable methods of transportation such as AFVs to reduce emissions, diversifying their fleet for more flexibility towards market changes, innovative technology such as fleet management systems, eco-driving through education, improving energy savings and lobbying for reforms of laws and regulations which may help companies in their shift to making operations consistently more sustainable and protecting those who invest in making their practices constantly more sustainable.
RQ2: What are the motivating drivers for making the LML operations more sustainable regarding all three aspects of the TBL, particularly regarding CSR and environmental issues?

Axfood, a Swedish leading food retailer that focusses on sustainability issues presented three mainly important drivers of SLML operations that are primarily responsible for how they manage best sustainable practices.

First, the importance was placed on the environmental and social consciousness and concern of shareholders and the top management team, who have dedicated important resources and capabilities in order to make the LML process more sustainable. Thus, the corporate culture and the vision of the firm played a paramount role in the development of such best practices since Axfood’s aim is to constantly seek to improve their practices, to make them as sustainable as possible.

Secondly, there is the external pressure from consumers and the society through the media and various NGOs due to their rising concern regarding the respect of the environmental and mitigating social issues. This turned out to be one of the greatest and most significant drivers for adopting SLML. More SLML practices could enhance the brand image that would convey economic, environmental and thus lead to social recognition and customer loyalty.

Thirdly, the driver considered essential for the achievement of best sustainability practices, in the case of Axfood, is in fact an internal driver. A dedicated and proactive top management and a majority owner of the company who is deeply involved and engaged in reducing the social and environmental externalities of operations without compromising their competitive edge and financial soundness. They gather teams with common views and philosophy, who have great concern in regard to sustainability and who will improve the organization continuously. This is done through educating the workforce, investing in cleaner and leaner technologies and actively lobbying so that other organizations follow in this direction that aims for a future, where the needs of the present do not compromise the ability of the future generations to meet theirs.
7.1 Findings and research contribution

Relating to the research gap there is in the literature on sustainable LML operations in the Swedish FRI, this study provided insight on how a highly sustainability-oriented food retailer manages to adopt best sustainable practices in its LML and what the major driving forces of such operations are in the case of this company with its specificities. This study, the authors believe contributes to theory literature by deduction to how important various drivers are for the achievement of best sustainable practices in LML in the FRI in Sweden, by reinforcing the empirical evidence on the significance of various drivers in regard to the three aspects of the TBL. Proactive management, stakeholder pressure and innovative technology through its diverse benefits have proven to be the most influential drivers for achieving best practices in the case of Axfood. This in no means takes away the relevance or influence of other drivers, which all contribute to a higher and more effective achievement of these goals. However, in the context of the Swedish FRI, some have greater impact and potential for making a company successful in finding the best possible balance between the three dimensions of the TBL. It could be described as a different weighting of the drivers from one food retailer to another, and possibly from one country to another.

7.2 Limitation and further research

This project involves a single food retailer operating in Sweden with results seeking depth over breadth. The company is widely regarded as one of the best in terms of sustainable practices in its industry, through its involvement for more sustainability-oriented law, regulations and incentives, proximity with consumers and other stakeholders and engagement for constant improvement regarding social and environmental issues. It would thus be interesting to observe similar companies in the FRI in Sweden or elsewhere to reinforce theoretical claims and to support and consolidate empirical findings. Moreover, Sweden is widely recognized as a country with a relatively high level of societal engagement regarding social and environmental issues, which is why further studies like this one in a different country
may conclude a different level of significance of certain drivers of sustainable LML. Extensive empirical evidence and studies are therefore necessary for a better understanding of the approach taken by food retailers towards issues of the TBL in their LML operations. By identifying, describing and analyzing the main drivers of SLML operations in the FRI, opportunities may arise for other urban retailers to adopt similar sustainable practices. Finally, more research on the influence of laws and regulations on food retailers’ sustainable LML practices and more accurate methods of measurement or performance indicators in terms of social and environmental performance in LML may provide tools to create a higher level of awareness of all externalities and to aid organizations in achieving best sustainability practices more efficiently.
8 References


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Appendices

Interview Guide

Ethical Considerations:

- Explanation of thesis topic and goals of research
- Assurance that information is only used for the benefit of this project
- Permission to record the interview and to mention interviewee and company names

General questions:

- How does the company tackle sustainability issues? Are there any priorities ranked in a certain way for instance? Why?
- Do sustainable awareness seminars take place within the company? If yes at what levels and how does it affect the everyday operations?
- Is there any motivation coming from outside the company to encourage you to make your LML operations more and more sustainable? Any opportunities in current policies or regulations that would push the company towards more sustainable operations? Market and trend motivations?
- How do you think your company can improve its performance from a sustainable perspective? (Any areas that need improvement more than others)
- Is there any sort of collaboration with other food retailers in terms of LML operations innovation?
- What is the weight of regulations in the development of sustainable practices?
- What would encourage you to make your LML operation constantly more sustainable?
• As an industry leader in terms of sustainable practices, what or how much of an impact do you believe Axfood has on other food retailers in promoting these practices, or in making these practices commonly adopted?

• How can the achievement of sustainability goals differ comparing Axfood which is mainly owned by a private person, Axel Johnsson, and a traded company such as ICA?

Questions linked to RQ1:

1. Methods of Transportation
2. How are these methods more sustainable?
3. How are these methods put into practice/operationalized?

1. Methods of Transportation

a. What different vehicles are used within the company for LML? Fleet growth over recent years?

b. Through what authority are decisions of implementing these vehicles made? (local, regional, national level of company?)

c. Does Axfood commonly use innovative technology to improve the sustainability of the operations? Are investments being made in internet technology for logistics? If yes what are they and why?

d. Does your logistic company (Dagab) work and shape its strategy independently or are all decisions taken by Axfood? If not, how can you instill sustainability to your third party logistic provider / main suppliers?
2. **How are these methods more sustainable?**

   a. From the company’s perspective, what are the major benefits from these drastic changes? Economic? Social? Environmental? Specifics to food industry? And if so many benefits, what would the main reasons be for not investing more in this field?

   b. How could you improve the measure of sustainability in your logistic operations?

3. **How are these methods put into practice/operationalized?**

   a. What are the biggest changes that need to be made in order to adopt and adapt to the use of different transport methods?

   b. How does your company improve its energy savings in their last mile logistic process?

   c. What are the roles of the management team, in shaping a more sustainable strategy for the logistic process? Does the operationalization rely only on their will?

   - E.g. Infrastructure/personnel-skills/brand image/anything regarded as crucial to making the shift a successful one?

**Questions linked to RQ2:**

1. **Drivers of economic sustainability**
2. **Drivers of social sustainability**
3. **Drivers of environmental sustainability**
1. Drivers of economic sustainability

a. Does sustainable LML rhyme with reduction of operational costs and/or enhanced operational efficiency? (and examples)

b. Are there any incentives (e.g. financial) from outside the company that motivate a shift towards making LML more sustainable?

c. Are there any direct financial/economic benefits as a result of more sustainable methods of transportation (especially when considering electric lorries or hydrogen gas vehicles)?

2. Drivers of social sustainability

a. Are there any objectives from the company in terms of reducing negative externalities for the population in the cities (nuisance, pollution, congestion/traffic, etc.)?

b. Are there any specific measures that are taken when it comes to the safety of the road transportation process for the population? (e.g. issues of employee burn-out, physical/drug/alcohol tests, etc.).

c. What are the main issues being tackled in terms of CSR through more sustainable LML?

3. Drivers of environmental sustainability

a. According to what (figures, organizations, etc.) do you set your goals in terms of environmental sustainability?

b. What are the main alternative/renewable energy sources used by your company for your transportation means?

c. What methods are used to increase energy savings of the LML process?
d. In terms of environmental awareness, there are certainly laws and regulations that must be fulfilled by the company. As an industry leader in sustainable practices, do you believe you are doing much more than what the legal requirements are?
Interview Transcription

Face-to-face interview – 2nd of May 2017, Stockholm, Sweden

Interviewers: Anthony Claeys and August Le Gal

Interviewee: Åsa Domeij, Head of Environment and Social Responsibility of Axfood AB

Description
The following interview transcription is the result of a semi-structured interview. Therefore, for the benefit of clarity and due to the structure of the interview, where the conversation produced responses for different parts of the questionnaire simultaneously, the responses have been paraphrased. The authors however guarantee that the content of the responses are most accurate in regards to the responses of the interviewee in appropriate context and form.
General questions:

- How does the company tackle sustainability issues? Are there any priorities ranked in a certain way for instance? Why?

In LML transport, there is a greater emphasis on environmental and social aspect. However, social aspects are much regarded in all areas of the company.

- Do sustainable awareness seminars take place within the company? If yes at what levels and how does it affect the everyday operations?

E-Learning with basic knowledge must be done by everyone at all levels of the company (offices, warehouses, stores, etc.). Then more specific education tailored to each group of people (sustainability ambassadors in the stores, eco-driving for lorry drivers, etc.).

- Are there any motivation coming from outside the company to encourage you to make your LML operations more and more sustainable? Any opportunities in current policies or regulations that would push the company towards more sustainable operations? Market and trend motivations?

Demands from NGOs, organizations, customers, owner (Axel Johnsson, 51% shares) who is very involved, politicians/government (fossil-free Sweden project). In 2016, government asked Axfood to sign the challenge of becoming CO2-free by 2030, but in return, Axfood demands measures/political decisions to help them meet this sustainability challenge, which is crucial, especially regarding the environment, but which will also have a range of social and economic advantages.

- How do you think your company can improve its performance from a sustainable perspective? (Any areas that need improvement more than others)

By switching to renewable fuels and more sustainable (cleaner) energy sources in the future and working closely with suppliers on social issues (labor, production, etc).
• **Is there any sort of collaboration with other food retailers in terms of LML operations innovation?**

Not yet. It is a competing atmosphere at the moment between the food retailers in terms of innovation, being the first to adopt new technology and other innovations. However, working together with competitors would be seen as a positive initiative from our perspective.

• **What is the weight of regulations in the development of sustainable practices?**

We do not feel pressured by the government in terms of sustainability-directed laws and policies. There is more pressure from Axfood to the government to make them engage in policies rather than the government pressuring Axfood to follow any.

• **What would encourage you to make your LML operation constantly more sustainable?**

More incentives, such as government measures in terms of taxation of sustainable vehicles would be an aid to the process.

• **As an industry leader in terms of sustainable practices, what or how much of an impact do you believe Axfood has on other food retailers in promoting these practices, or in making these practices commonly adopted?**

There is a great emphasis on employee/er branding. We want to attract individuals who share the same views and would bring new ideas to keep on improving our practices.
• How can the achievement of sustainability goals differ comparing Axfood which is mainly owned by a private person, Axel Johnsson, and a traded company such as ICA?

It’s very important to have a powerful head of a company who is focused on achieving such goals. However, a great difference can be made simply by an ICA store manager who sets goals in terms of sustainability in LML, since there are privately owned stores. It is important to have conscious leadership [store manager or top corporate management] where influential decisions are made.

Questions linked to RQ1:

1. Methods of Transportation

2. How are these methods more sustainable?

3. How are these methods put into practice/operationalized?

1. Methods of Transportation

a. What different vehicles are used within the company for LML? Fleet growth over recent years?

Mainly HVO vehicles are used. The problem is that PFHD (palm oil) used in this source of energy and due to environmental issues of palm oil production, it will be abandoned soon (to pressure Finnish company “Neste”) but we believe that solution will be found by fall 2018. Temporarily go back to using diesel. NO EFV (electric) used yet, but possibly in the future. Investment represent a high risk (fleet should last at least 15 years and autonomy of vehicle still an issue). Discussions are taking place with Volvo on the development of Hydrogen gas and possibility of Axfood being first to use them/test them. Hence, more diversified strategy in methods of transportation are taking place.
b. Through what authority are decisions of implementing these vehicles made? (Local, regional, national level of company?)

Energimyndigheten (Swedish Energy Agency, works for a sustainable energy system). Authorities take a lot of practical decisions. Ministries in Sweden are very small compared to other countries (even Norway). It is considered that the pressure to implementing more sustainable methods of transportation comes from consumers (Swedish population) and company culture/values. Company owner A. Johnsson very engaged as well. More pressure is put on government by Axfood to pass laws/regulations to get other companies to follow.

There is a new law coming soon, that all companies selling fuel on Swedish market must increase amount of biodiesel: in 2030, 70% biodiesel. This fuel is not sustainable because it is not traceable and this law will solve that issue, forcing companies like Neste to stop using PFAD in fuels (population very critical of palm oil).

c. Does Axfood commonly use innovative technology to improve the sustainability of the operations? Are investments being made in internet technology for logistics? If yes what are they and why?

EFV lorries & electric-hybrid vehicles for city deliveries will be considered in near future if proven reliable.

d. Does your logistic company (Dagab) work and shape its strategy independently or are all decisions taken by Axfood? If not how can you instill sustainability to your third party logistic provider / main suppliers?

Initially DAGAB was only in charge of the warehouse & transportation. Now it does the purchasing and logistics. Great benefit of having own logistics rather than working with other company:
We use fleet management systems to follow up individual vehicles (fuel consumption, eco-driving, etc.)
The delivery van/truck drivers are provided with appropriate education. It would be difficult to follow up and keep sharp control of this information if work given to non-owned logistics company. Hence, the high level of control of sustainability factors in LML is due to the fact that we use our own company/vehicles. Bigger part of logistics (through Europe) is much more difficult to follow with accuracy and to monitor.

2. **How are these methods more sustainable?**

   a. *From the company’s perspective, what are the major benefits from these drastic changes? Economic? Social? Environmental? Specifics to food industry? And if so many benefits, what would the main reasons be for not investing more in this field?*

   Benefits:
   - Silent vehicle: early (night) deliveries are possible (ECO)
   - Reduced congestion, traffic, noise, pollution (ENV & SOC)
   - Hence better working conditions for drivers (SOC)
   - Time efficiency (empty roads) (ECO)

3. **How are these methods put into practice/operationalized?**

   a. *What are the biggest changes that need to be made in order to adopt and adapt to the use of different transport methods?*

Heavy load electric lorries are not available yet, and it is necessary for a vehicle to be able to drive an entire day without break for charging. Sufficient arguments and proof are needed to motivate the company to make the investments, but with the rise of alternative energies (hydrogen, biofuel, etc.), there will be more diversification which will facilitate these measures.
Also, political pressure is necessary. Axfood works a lot with lobbying organizations which helps solving the political issue.

b. **How does your company improve its energy savings in their last mile logistic process?**

Many measures exist [list of a few for LML hereafter]:

- Fleet management systems (individual follow-up of vehicles and info specific to lorry drivers): more efficient routes, possibility to inform drivers at all times;
- Eco-driving;
- Solar panels;
- top technology for lorry loading/unloading procedure (improved employee conditions).

c. **What are the roles of the management team, in shaping a more sustainable strategy for the logistic process? Does the operationalization rely only on their will?**

- E.g. Infrastructure/personnel-skills/brand image/anything regarded as crucial to making the shift a successful one?

Decisions made collaboratively: 3 main actors: Transportation Manager, Head of Environment and Social Responsibility (Åsa Domeij) and a Sustainability expert advisor.
Questions linked to RQ2:

1. Drivers of economic sustainability
2. Drivers of social sustainability
3. Drivers of environmental sustainability

1. Drivers of economic sustainability

a. **Does sustainable LML rhyme with reduction of operational costs and/or enhanced operational efficiency? (and examples)**

Fleet runs on biodiesel, and there is a fleet management system to follow up the activity of each vehicle individually (e.g. exact fuel consumption), which represents considerable long-term cost savings.

Issue however arises when it comes to investing in new fleet with new technology and new systems is that if you’re not sure it will work for at least 10 years: investment risk is too high [economic sustainability]. A lot must be taken into account since new fleet also means having to invest in other material and changes organization of operations. Solution to this could be if manufacturer of new technology would lease vehicles long-term.

b. **Are there any incentives (e.g. financial) from outside the company that motivate a shift towards making LML more sustainable?**

In terms of economic sustainability, being constantly conscious of customer/society demands and concerns consolidates economic sustainability, but also contributes to improving social and environmental practices which are important to society.

c. **Are there any direct financial/economic benefits as a result of more sustainable methods of transportation (especially when considering electric lorries or hydrogen gas vehicles)?**
A clear answer cannot be provided. A lot is speculation, but most of the small operational cost advantages will be discovered when the new technology/types of vehicles will be used. However, some cost advantages and operational differences which will benefit the company include:

- Lower energy costs;
- reduced delivery time (silent EFVs would make night deliveries possible: no traffic);
- lower risk of being involved in road accidents (with pedestrians or other vehicles)

2. Drivers of social sustainability

a. Are there any objectives from the company in terms of reducing negative externalities for the population in the cities (nuisance, pollution, congestion/traffic, etc.)?

Axfood is more dedicated and focuses mainly on how to mitigate environmental and social issues even if sometimes an economic trade-off is in question. “It’s really not a question of economic concern at times; it’s more a question of sustainability in general: reducing emissions and improving working conditions [at Axfood but also the workforce of suppliers, especially in third-world countries]”

b. Are there any specific measures that are taken when it comes to the safety of the road transportation process for the population? (e.g. issues of employee burn-out, physical/drug/alcohol tests, etc.).

Regular follow-ups are carried out to ensure wellbeing of employees to ensure road safety and security.

c. What are the main issues being tackled in terms of CSR through more sustainable LML?
Working conditions of lorry drivers and employees involved, finding the best times to deliver [less pollution, congestion, noise and other nuisance that disturbs the population]

3. Drivers of environmental sustainability

a. According to what (figures, organizations, etc.) do you set your goals in terms of environmental sustainability?

Axfood goes beyond local, national and European requirements in terms of environmental and social objectives notably. Most of the pressure to make changes for the better would come from employees (who demonstrate great interest), customers or even the owner who is very engaged regarding all aspects of sustainability.

b. What are the main alternative/renewable energy sources used by your company for your transportation means?

HVO (biofuels), hybrid and electric vehicles will be adopted in the future, hopefully as soon as possible. The aim is to diversify the fleet.

c. What methods are used to increase energy savings of the LML process?

Eco-driving, employee training, avoiding empty running through better loading are some of the main measures.

d. In terms of environmental awareness, there are certainly laws and regulations that must be fulfilled by the company. As an industry leader in sustainable practices, do you believe you are doing much more than what the legal requirements are?

Axfood engages in sustainability practices and is far ahead of required standards. We fight for other players of the industry to follow in the same path.