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An investigation of driving forces and strategies for the transition towards green supply chains

A study on Swedish e-commerce companies

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Abstract

Emissions of greenhouse gases are the main reason for the increasing temperatures in our atmosphere. One reason for the increased amount of emissions is the enhanced need for transportation that the rapid growth of e-commerce has led to. This has also led to an increased interest in environmental sustainability and a growing need for green supply chains where emission reporting can be used. It is therefore interesting to investigate what drives e-commerce companies to develop green supply chains, and how the companies´ strategies are affected by green development. The purpose of this study is therefore to identify driving forces for the transition towards green supply chains through e-commerce companies´ strategies. To fulfil the purpose, the downstream part of e-commerce companies´ supply chains will be studied.

The literature revealed different driving forces for the transition towards green supply chains. These drivers were divided into internal and external driving forces based on their character. Additionally, activities for the development of green supply chains for e-commerce companies were identified in the literature and thereafter divided into two strategic areas. Interviews were performed with six different e-commerce companies to investigate which of the identified driving forces and activities within the strategic areas the companies had experienced. Swedish e-commerce companies within different sectors and with different revenues were interviewed for this study. The result from the interviews indicated that the e-commerce companies had more experience with the internal driving forces and it also showed that the internal drivers were prioritised as more important compared to the external driving forces. Further, both strategic areas were experienced by the same amount of e-commerce companies, whereas a few companies had experienced both strategic areas. The majority of the e-commerce companies interviewed also gathered emission data, but most of them did not work actively with it and there was no specific strategic area where emission reporting was more included.

In conclusion, the most frequently experienced driving forces were the same for the two strategic areas. This indicates that the most experienced driving forces were the same regardless of the strategy experienced for the transition towards green supply chains. Further, the internal driving forces were prioritised higher by most of the e-commerce companies interviewed and can therefore be seen as more important for the transition towards green supply chains in this study.

Acknowledgement

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Glossary

Bottom-up approach – when decision making is incorporated from the bottom of the hierarchy.

Carbon dioxide equivalents – a unit of measurement to compare the emissions from various greenhouse gases. Carbon dioxide equivalent takes the greenhouse gases global warming potential in consideration.

E-commerce companies – companies that buys and sells goods and services over the internet. Limited to business to consumer (B2C).

Emission reporting – consists of carbon dioxide equivalents but will further be named as only emission reporting. Emission reporting is calculated emissions from downstream transportations.

Green logistics – refers to all attempts and measures aimed at reducing the ecological impact of logistics activities.

Green practices – activities that aim to develop environmental sustainability.

Greenhouse gases (GHG) – is a category of gases that provides an increased greenhouse effect. The main GHG in the Earth's atmosphere are e.g. carbon dioxide, methane and water vapor.

Logistic service provider (LSP) – perform operations and manage the logistic system.

Nudging - influencing people's judgment, choice or behaviour in a predictable way.

Shipper – a buyer of logistic services.

Supply chain – the network of a company and its suppliers to produce and distribute a product to the final buyer.

Supply chain strategy – strategies regarding the supply chain. Logistic strategy is, for this thesis, a part of the supply chain strategies and will therefore be referred to as a supply chain strategy.

Top-down approach – when an executive-, or top management person hold decision making powe

1. Introduction

This chapter aims to present a background for the underlaying problem in this study and thereafter introduce the study's purpose.

1.1. Background

Emissions of greenhouse gases are the main reason for the increasing temperatures in our atmosphere and the emissions mostly relate to the combustion of fossil fuels (European Commission, 2022a). Whilst other economic sectors, e.g. industry and energy production, have reduced their greenhouse gas emissions since 1990, the transport sector has increased its emissions (European Environment Agency, 2022). One reason for the increased amount of emissions within the transport sector is the rapid growth of e-commerce and the growing need for freight transport has led to more than 8 percent of global greenhouse gas emissions allocates from freight transportation today (International Transport Forum, 2015; MIT, 2020; Mucowska, 2021; Velazquez and Chankov, 2019). The European Commission has therefore set goals regarding the greenhouse gas emissions from transportation until the year 2050, which says that the European Union will decrease its emissions by 60 percent compared to 1990 levels (European Commission, 2022b).

Due to global emission reduction targets, stakeholders have increased their interest in information regarding companies´ sustainability work and supply chain emissions (Karim et al., 2021). The increased interest in environmental sustainability has led to a growing need for green supply chains (Zhang et al., 2020). Zhang et.al (2020) states that green supply chains highlight the interaction between the ecological environment and the logistics system in an environmentally friendly way. By making segments of the supply chain more environmentally sustainable, competitiveness and economic performance can get enhanced (Malviya et al., 2018). Despite this, green supply chains have not been adopted globally due to e.g. lack of environmentally friendly investments and ineffective financial incentives (Zhang et al., 2020). At the same time, consumer awareness regarding their environmental impact has increased which has contributed to an expanded demand for more environmentally sustainable solutions (Buerke et al., 2017). This itself puts pressure on companies to disclose information regarding emissions from transportation (Karim et al., 2021).

To achieve sustainable development within a company, green supply chain strategies are important (Cetinkaya et al., 2011). By identifying the most influential logistic activities that affect transportation and the development of green supply chains, the right strategies can be held which can contribute to minimising the total environmental impact of the company (Zhang et al., 2020). A starting point for companies´ transition toward green supply chains is by reporting emissions

from their transportation (Herold and Lee, 2018). Emission reporting is one way to achieve sustainable development within a company, but other green supply chain activities are also important for the transition.

The increasing emissions from supply chains and stakeholders' pressure for more sustainable actions might act as different driving forces for companies' transition towards green supply chains. Further on, different strategies can affect the development of green supply chains differently. In this study, we therefore seek to identify drivers for the transition toward green supply chains by studying e-commerce companies downstream. This study also seeks to investigate how e-commerce companies' strategies can affect the development of green supply chains.

1.2. Purpose

Based on the information presented above the purpose for the study has been developed:

Identify driving forces for the transition towards green supply chains through e-commerce companies' strategies.

2. Context specification

This chapter aims to provide a brief contextual background to the studied area. This thesis is created together with Linköping's University and a company within the logistics field. To fully understand this thesis, the structure of the supply chain is crucial, and it is therefore important to be aware of the different actors within the supply chain.

2.1. Actors within supply chains and the relation between them

To succeed with greening the supply chain it is, according to Jazairy (2020), important to understand the relationship and interactions between actors in the supply chain. Huge-Brodin et al. (2020) describe two core actors within the supply chain: shippers and logistical service providers (LSP). A shipper is a buyer of logistic services, which typically can be a retailer or manufacturer and LSPs provide shippers with various types of logistical functions such as warehousing and transport (Huge-Brodin et al., 2020; Jazairy, 2020). According to Sallnäs (2016) studies regarding green logistics have to a large extent excluded customers of the logistic service. However, the shipper´s demand regarding environmental practices will have an impact on the environmental practice of the organisation that provides the logistic service (Sallnäs, 2016). Jazairy (2020) states that shippers are reliant on LSPs since they hold greater competences in green logistics activities. Since it is LSPs that report emissions from transportation, transparency is necessary for shippers to obtain knowledge regarding their environmental impact (Piecyk and Björklund, 2015).

According to Martinsen and Björklund (2012) and Huge-Brodin et al. (2020) shippers tend to have a weaker environmental demand compared to LSP. Despite this, Martinsen and Björklund (2012) have identified that shippers´ demand for more sustainable services have increased over the years and more shippers are now interested in data regarding their environmental impact. Studies have shown that there are different reasons for an increased demand for sustainable activities amongst shippers. The increased level of governmental regulations in different parts of the world might force shippers into requesting emission data from LSPs to develop green supply chains (Scholtens and Kleinsmann, 2011). Zhang et al. (2020) also describe that the demand for green supply chains might emerge because of the increased environmental awareness amongst consumers and shippers then need to integrate sustainability into their companies to stay competitive. The increased demand for green supply chains from shippers created the idea for this study.

2.2. The main actor for this study – e-commerce companies

A supply chain can be divided into upstream and downstream distribution flows. The upstream supply chain includes all activities related to the organisation´s suppliers and the downstream stages of the supply chain are those in which finished products are distributed to the customers (Alkhatib, 2017). One type of shipper in the downstream part of the supply chain is e-commerce companies. Along with e-commerce companies´ increased sales over the last decade, they are now pressured for more sustainable services (Velazquez and Chankov, 2019). E-commerce companies´ downstream supply chains differ from other shippers, e.g. since they do not ship to stores to the same extent and have a more irregular flow. Additionally, distribution from e-commerce companies is often characterised by short lead times, rapid deliveries, and just-in-time strategies which can contribute to an increased demand for transportation (Comi and Savchenko, 2021). It is therefore interesting to investigate the main reasons for the increasing environmental awareness amongst e-commerce companies, which this study will focus on.

This thesis is created together with Linköping´s University and a logistics company. The company works globally and has customers in different parts of the world. These customers are actors in various industries and the partnering company creates solutions for their customers´ complex logistics flow. This company has customers both upstream and downstream of the supply chain. This study will examine six e-commerce companies and these e-commerce companies operate in different sectors with different revenues. All six e-commerce companies´ downstream flow will vary, e.g. depending on warehousing location or mean of transport. Therefore, it is interesting to investigate what drives their work towards green supply chains and how their strategies regarding these parts of the supply chain will differ. The result of this study will be useful for e-commerce companies in their transition toward green supply chains. The result can also contribute to sustainability work for other actors within the supply chain and information from the study can be of value for actors who are interested in the transition towards a green supply chain.

3. Frame of reference

This chapter aims to present the literature used for this study. The literature review is based on two main topics, green supply chains, and supply chain strategies.

3.1. Chapter structure: Frame of reference

The chapter Frame of reference is divided into two main areas: Green supply chains and Supply chain strategies, see Figure 1. The first part describes green supply chains in general. This is included because it is considered important to provide a broader understanding of the subject and the potential of sustainable logistical solutions. Further, it is also important to evaluate the drivers for companies to include the transition towards green supply chain in the organisation. The second part of this chapter, supply chain strategies, presents the different levels of strategies within a company and how these strategies can be integrated with a company's sustainability work. This part also highlights the activities within green supply chain strategies.

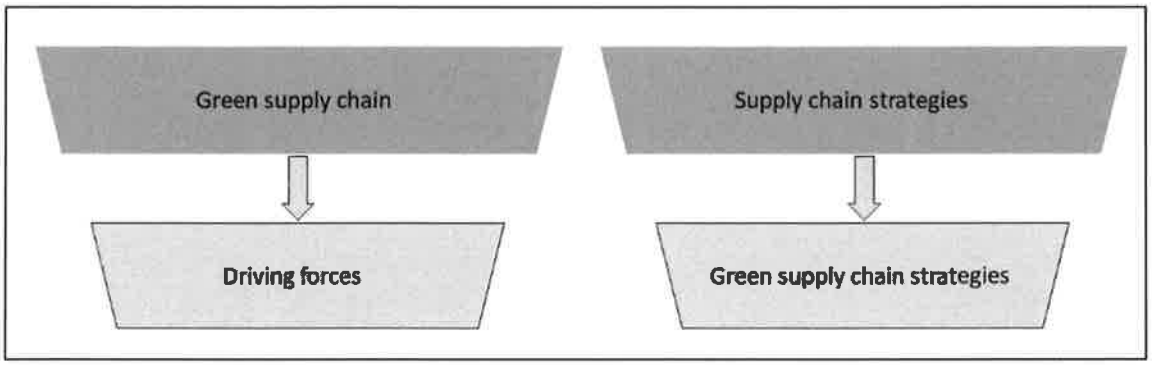


Figure 1. The two main research areas for this study.

3.2. Green supply chain

The increased globalisation has put pressure on the development of logistics systems and also contributed to the increase of negative externalities, e.g. carbon dioxide emissions (Zhang et al., 2020). To improve the ecological quality, the development of logistics is crucial and green supply chain management integrates environmental thinking into the entire supply chain (Micheli et al., 2020). There are many different definitions of green supply chain management and the definitions can vary tremendously regarding where the system boundaries are set (Meager et al., 2020). For this study, green supply chain management is defined by Meager et al. (2020), as the active integration of environmental consideration into the supply chain, ranging from procurement of natural resources to end of life solutions including waste and by products.

Green supply chains have the aim to integrate sustainability into logistics activities within the supply chains (Klumpp, 2016; Zhang et al., 2020). Additionally, green supply chains aim to reduce the environmental impact of all logistics activities, both operational and managerial, such as transportation, distribution, and warehousing. Klumpp (2016) identifies that green supply chains include all three areas of sustainability. Although, the environmental aspect will have the largest focus for this study and usually regards reduced energy consumption and emissions. Being a green company that works with "greening" of the supply chain can increase competitiveness as well as the brand image (Martinsen, 2014). Zhang et al. (2020) elaborate that green supply chains are crucial for both economic and environmental development.

3.2.1. Driving forces for the transition towards green supply chains

To be able to understand why companies work with the transition towards green supply chains it is important to examine the driving forces (drivers) (Córdova et al., 2018). Drivers are factors that push organisations to enhance their environmental sustainability level (Meager et al., 2020). Meager et al. (2020) states that governmental regulations for more sustainable industries and stakeholders´ pressure to quicker adopt sustainability into the firm are two examples of potential drivers for companies´ sustainability work. Further, the interest in carbon disclosure activities has increased in recent years due to societal and scientific debate regarding the environmental impact of industrial activities (Córdova et al., 2018; Herold and Lee, 2018). Additionally, organisations´ internal sustainability goals and the level of environmental awareness incorporated into the company may also affect the driving forces to develop green supply chains (Singh et al., 2019). Driving forces for companies may therefore be affected by both internal and external factors such as top management support (internal), cost reduction (internal), society demands (external), and pressure from competitors (external) (Hebaz and Oulfarsi, 2021). This study will focus on both internal and external driving forces.

The literature reveals different driving forces for companies to develop their sustainability work and in Table 1 are the mentioned drivers listed. Driving forces for both emission reporting and green supply chains are included in this table. Drivers for emission reporting are included to highlight the aspects that are important for companies to include emission data into the organisation and drivers for green supply chain are included to gain broader knowledge regarding reasons for firms to include sustainability into logistical activities. By combining these two areas, some of the most frequently mentioned drivers in the literature for the transition towards green supply chains will be identified.

Table 1: Internal and external driving forces identified in the literature regarding emission reporting and green supply chains

		Emission reporting					Green supply chain							Total
		(Scholtens and Kleinsmann, 2011)	(Herold and Lee, 2018)	(Björklund and Forslund, 2013)	(Hickmann, 2017)	(Córdova Román et al., 2021)	(Salhieh and Abushaikha, 2016)	(Walker et al., 2008)	(Oberhofer and Dieplinger, 2014)	(Micheli et al., 2020)	(Meager et al., 2020)	(Hebaz and Oulfarsi, 2021)	(Singh et al., 2019)	
Internal drivers	Cost reduction	x	x	x			x	x	x	x	x	x	x	10
	Environmental awareness	x					x				x	x	x	5
	Target setting			x			x		x					3
	Attitude of employees			x				x				x		3
	Top management support					x	x	x			x	x	x	6
	Innovations						x			x		x	x	4
External drivers	Customer demand	x	x	x	x		x	x	x	x	x	x	x	11
	Supply chain relationships	x					x	x	x	x		x	x	7
	Governmental regulations	x		x	x		x	x	x	x	x	x	x	10
	First mover advantage				x									1
	Competitiveness	x	x	x			x	x	x	x	x	x	x	10
	Investors		x		x	x		x				x		5

Table 1 indicates numerous driving forces from previous literature for companies to implement green supply chains and emission reporting in the organisation. This study will highlight the three most frequently mentioned internal and external drivers. The less mentioned driving forces will only be explained briefly in the following section.

Internal driving forces

In this section, the internal driving forces previously mentioned in the literature will be described. Internal drivers are organisational factors, and in this study, the most frequently mentioned drivers are Cost reduction, Environmental awareness, and Top management support. These will be explained in depth and the remaining drivers will only be described briefly.

Cost reduction

Cost reduction is seen as an internal driver for companies when trying to improve a firm's environmental performance and cost reduction can be used to improve a firm's profit (Björklund and Forslund, 2013; Scholtens and Kleinsmann, 2011; Walker et al., 2008) Cost reduction is a great incentive to act on environmental performance due to the relationship between reducing energy cost and emissions (Scholtens and Kleinsmann, 2011). Cost reduction can be an incentive for both emission reporting and different energy reduction practices (Scholtens and Kleinsmann, 2011). A company needs to understand the relationship between economic performance and cost reduction associated with environmental processes (Micheli et al., 2020). According to Scholtens and Kleinsmann (2011) companies understanding of the relationship between energy cost reduction and emission reporting is crucial for them to develop green supply chains. According to Björklund and Forslund (2013) cost is often related to the logistic system performance and lowering logistic cost has the potential to increase environmental performance for companies. Cost reduction is also used to visualize the benefits of environmental work and thereby increasing both the organisation's cost efficiency and environmental footprint (Singh et al., 2019). Walker et al. (2008) also state that emissions often represent a hidden cost in form of waste resources and emission reporting can therefore be used for waste reduction, which will lead to monetary profit.

Environmental awareness

Another internal driving force for companies´ transition toward green supply chains is environmental awareness within the company (Scholtens and Kleinsmann, 2011). According to Scholtens and Kleinsmann (2011) this driving force might occur when firms realize that their operations impact the wellbeing of future generations. Due to increased concerns regarding environmental issues worldwide, environmental awareness has grown as a driver for companies (Hebaz and Oulfarsi, 2021; Meager et al., 2020). Hebaz and Oulfarsi (2021) state that companies cannot ignore changes that once seemed to be future problems, such as melting ice caps, that are happening today. These environmental problems could also cause a scarcity of resources in an unsustainable supply chain which makes it harder for organisations to ignore the pressure to respond by introducing environmentally friendly methods (Meager et al., 2020; Singh et al., 2019). This driving force might engage firms to go beyond what is legally required in environmental practices to be able to meet the need of the present without compromising with needs of the future generations (Scholtens and Kleinsmann, 2011). Firms with Environmental awareness as a driver may adopt more advanced environmental strategies which makes their sustainability work more

effective (Meager et al., 2020; Salhieh and Abushaikha, 2016). Salhieh and Abushaikha (2016) also state that when environmental strategies derive from regulations, the effect on environmental management is lower than if environmental strategies are derived from green awareness.

Top management support

To implement green strategies into a firm's supply chain, support from top management is of significance (Hebaz and Oulfarsi, 2021). Moreover, Björklund (2012) agrees that active support from top management is essential to succeed with sustainability initiatives. Top management support is seen as an important driver since top management holds decision making power regarding what direction the company will go towards (Meager et al., 2020). Björklund (2012) continue to state that a reason for the lack of top management supports usually stems from environmental work traditionally being handled in operational services which are lower hierarchical dimensions. Additionally, companies are more eager to emission report if they have a sustainability committee or sustainability unit (Córdova Román et al., 2021). Additionally, a company's work culture develops from top management which will influence all parts of the firm (Björklund, 2012).

Others

In addition to the drivers described above, three of the investigated articles mentioned Target setting as a driving force for emission reporting for the transition towards green supply chains (Björklund and Forslund, 2013; Oberhofer and Dieplinger, 2014; Salhieh and Abushaikha, 2016). According to Björklund and Forslund (2013) companies might need emission data to be able to have a systematic approach to setting targets and it is, therefore, a driver for companies to report emissions. Another driving force mentioned in the literature was the attitude of employees (Björklund and Forslund, 2013; Hebaz and Oulfarsi, 2021; Walker et al., 2008). A company's environmental approach might depend on employees' environmental knowledge and awareness (Björklund and Forslund, 2013). Walker et al. (2008) have identified a positive correlation between a company's environmental development and the employee's involvement. Another driver that was also mentioned in the literature is Innovations (Hebaz and Oulfarsi, 2021; Salhieh and Abushaikha, 2016; Singh et al., 2019). Companies are continuously trying to create new ways to improve their competitiveness and innovations might act as a driver for the development of green supply chain and emission reporting (Hebaz and Oulfarsi, 2021).

External driving forces

The most mentioned external driving forces will be described in this section. External drivers are factors that occur outside the company, and in this study will Customer demand, Governmental regulations, and Competitiveness be explained in depth and the remaining drivers will briefly be described.

Customer demand

In recent years, companies have become forced to include sustainable thinking into their business model after growing pressure from customers (Hebaz and Oulfarsi, 2021; Micheli et al., 2020; Salhieh and Abushaikha, 2016; Sureeyatanapas et al., 2021). In order to satisfy customers, organisations have started to develop strategies regarding green practices in their business operations (Hebaz and Oulfarsi, 2021). Additionally, Micheli et al. (2020) state that green

strategies for reputation building are one of the most important drivers to succeed with environmental work. Customers´ environmental awareness has increased which leads to a growing demand for green supply chains (Zhang et al., 2020). Zhang et al. (2020) state that this growing awareness forces companies to develop environmentally sustainable systems to be able to satisfy customer demand. Additionally, customers have different reasons to pressure organisations in implement green practices into their strategies (Micheli et al., 2020). It is shown that consumers are requesting more environmentally friendly products from their suppliers which puts them in a position to pressure companies to develop their environmental activities (Walker et al., 2008).

Governmental regulations

Another external driver for companies´ transition toward green supply chains is to meet authority's regulations (Björklund and Forslund, 2013). Some companies might only report emissions from the organisations´ activities because of governmental regulations that compel firms to track their emissions (Scholtens and Kleinsmann, 2011). Governments are globally promoting green practices by making environmentally irresponsible companies difficult to sustain which leads to quicker adoption of green practices (Meager et al., 2020). These regulations occur on different levels, national regulations might differ considerably for companies but international regulations such as those in the EU are valid for many companies all around Europe (Björklund and Forslund, 2013). According to Björklund and Forslund (2013), the environmental performance of a company will be influenced by the authority level and the presence of stricter regulations. Higher regulatory requirements will increase the company's environmental performance and might also result in positive economic growth (Micheli et al., 2020). Micheli et al. (2020) describe that one explanation for the increased economic performance while facing higher pressures from regulations, may be that companies try to increasingly meet the government requirements to avoid fines. Additionally, the main reason for regulatory compliance as a driving force is that companies are obligated to follow governmental regulations to be able to stay competitive in the market (Oberhofer and Dieplinger, 2014).

Competitiveness

Another important external driver for the transition towards green supply chains for companies is to become more competitive and a proactive approach to environmental strategies is a way to do so (Micheli et al., 2020; Walker et al., 2008). Environmental sustainability is today a fundamental approach in the competitive landscape and companies need to adopt sustainability initiatives to achieve a competitive advantage (Björklund and Forslund, 2013; Salhieh and Abushaikha, 2016). Firms can gain legitimacy from sustainable activities and therefore also gain a competitive advantage over competitors by including emission reporting as a core activity (Herold and Lee, 2018). When competitors in an industry successfully implement a sustainable activity, other companies might be obligated to imitate the actions to stay competitive (Micheli et al., 2020). By developing green strategies companies can comply with environmental standards in the industry and therefore also generate competitive advantage (Hebaz and Oulfarsi, 2021). It is also shown that firms´ reputation to third party organisations is a central driver for implementing green strategies and therefore staying competitive (Hebaz and Oulfarsi, 2021). This driving force, unlike customer demand, focuses on the pressures from other companies in the same industry to stay competitive.

Others

In addition to the external driving forces previously explained in this chapter, the literature also mentioned supply chain relationships as a driver for the development of green supply chains (Salhieh and Abushaikha, 2016; Scholtens and Kleinsmann, 2011; Walker et al., 2008 and others). Green activities and emission reporting might enhance the relationship between companies within the supply chain and companies might be more attractive to other actors in the supply chain if they continuously work with green activities (Scholtens and Kleinsmann, 2011; Walker et al., 2008). First mover advantage is also mentioned as a driving force in a few studies and Hickman (2017) describes that companies might obtain first mover advantage over their competitors by implementing emission reporting and green supply chain actions into the organisation. Studies also indicate that Investors might act as a driving force in developing green supply chains (Herold and Lee, 2018; Hickmann, 2017; Walker et al., 2008 and others). Herold and Lee (2018) explain that investors might pressure firms to implement green activities in the organisations and investors can therefore drive companies to develop green supply chains in order to stay competitive.

3.3. Supply chain strategies

Leading strategy theorists such as Chandler, Porter, and Mintzberg point out different important elements of strategy (Whittington et al., 2020). According to Porter (1996) the differences between companies´ strategies come from different activities performed. A firm can either perform different activities or perform the same activities but differently, which will result in competitiveness (Porter, 1996). A way to define strategy is by different hierarchical levels where there are differences between corporate strategies and supply chain strategies (Sandberg, 2015). There are challenges to accomplishing a holistic view over the multi-layered fields of supply chain and a supply chain strategy is therefore needed (Cetinkaya et al., 2011). According to Sandberg (2015) corporate strategies are on a more general level compared to supply chain strategies and they focus on how to maximize an organisation's profitability and growth, see Figure 2Figure 2. Supply chain strategies on the other hand are more operational and on a lower hierarchical level. Corporate strategies often lay the foundation for more specific supply chain strategies (Sandberg, 2015). Supply chain strategies are important for organisations´ competitiveness and have traditionally only been an aspect that the employees at the logistics department integrated into their daily work. According to Sandberg (2015) it should be integrated into the whole company and into a higher organisational level to gain a competitive advantage.

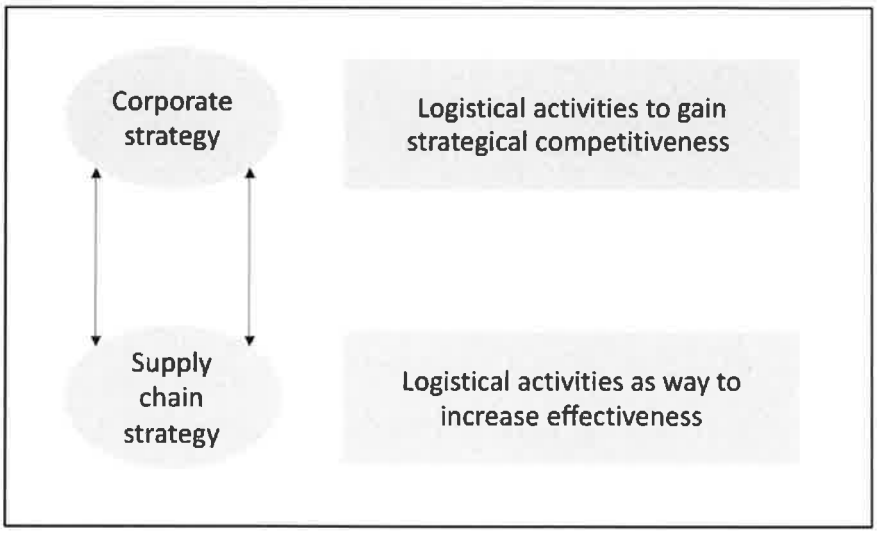


Figure 2: Shows the different levels of corporate strategy and supply chain strategy, and the figure also includes a short explanation of the activities within the strategies based on Sandberg (2015).

Supply chain strategies define goals and configuration over four different areas with included activities within logistics according to Cetinkaya et al. (2011), see Figure 3. Regarding partners, Cetinkaya et al. (2011) state that supply chain strategies include activities regarding the process of selecting partners and how they should work together. Moreover, Cetinkaya et al. (2011) state that structures in supply chain strategies are about the configuration of network and distribution, both upstream and downstream, and that processes are regarding the configuration of procurement, network structure, and production considering e.g. cost, reliability and flexibility. The last supply chain strategic area is systems which include activities regarding how management, information, controlling, reporting, and inducement are arranged (Cetinkaya et al., 2011).

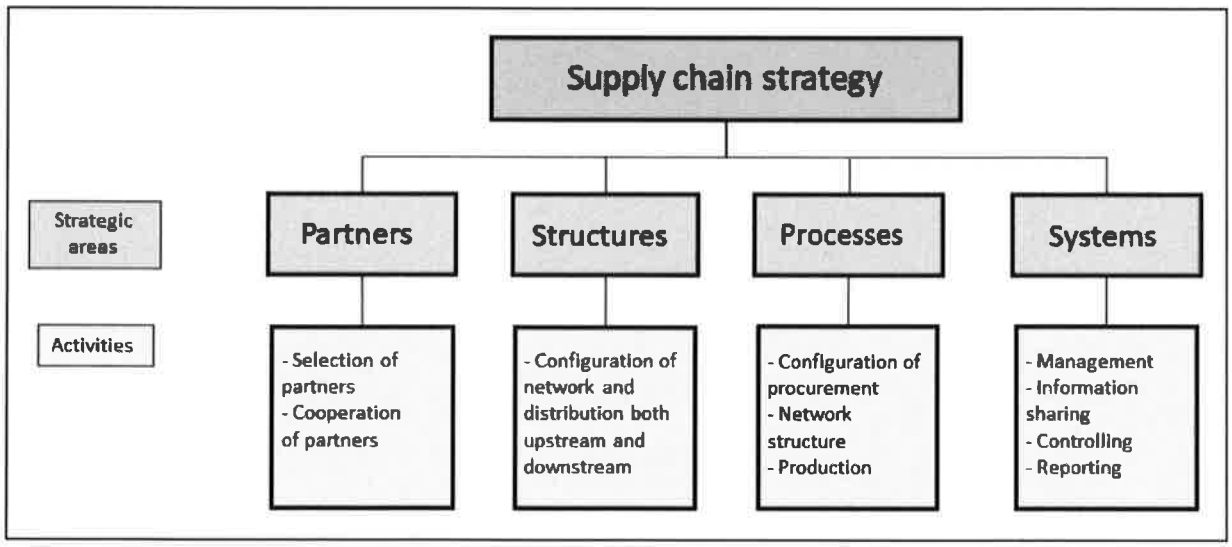


Figure 3: Shows the four areas within supply chain strategies and the connected activities based on Centikaya et al (2011).

3.3.1. Activities for green supply chain strategies

Studies today have shown that supply chain strategies focus on "supply" and "demand" characteristics rather than external conditions concerning the supply chain, such as political, ecological, social, and technological conditions (Cetinkaya et al., 2011). According to Cetinkaya et al. (2011) this is the main reason why supply chains underestimate the relevance of sustainability in their strategies. Since transportations through the supply chain heavily impacts the environment, logistics as a function plays a large role in the improvement of a more sustainable performance (Aronsson and Huge-Brodin, 2006). Hence, a green supply chain strategy is important to achieve sustainable development within a company (Cetinkaya et al., 2011).

To be able to develop green supply chain strategies, management expertise is essential along with engagement from top management (Jazairy and von Haartman, 2020; Sreekumar and Rajmohan, 2018). The internal management within a company needs to identify decisions that influence the environment but also try to foresee the environmental consequences that these decisions contribute to (Aronsson and Huge-Brodin, 2006). Therefore, the decision making process is an important aspect to consider to be able to obtain a strategy for a green supply chain (Alexander et al., 2014). Further, the responsibility to include green supply chain strategies is shared between all partners in the supply chain since all of them affect the supply chain's environmental performance (Sreekumar and Rajmohan, 2018). Björklund (2012) states that partners most of the time have the largest environmental impact on the supply chain and therefore might the selection of partners highly impact the development of green supply chains. According to Sallnäs (2014) the relationships between partners in a supply chain is of importance to achieving green supply chains. To develop green supply chains, companies need to understand emissions from the activities within the supply chain and one way to do this is by emission reporting. Emission reporting can be used as a sustainability indicator in order for companies to reduce carbon emissions and stay competitive (Kumar et al., 2020). Despite the advantages of emission reporting, it is not yet standardised and is mainly a voluntary activity (Córdova et al., 2018; Liesen et al., 2015).

In a study from Perotti et al. (2012) eight activities for green supply chains have been identified with special regard to the logistic area: green supply, distribution network, warehousing, reverse logistics, cooperation with customers, investment recovery, eco-design, and internal management, see Table 2. Table 2 has almost exclusively relied on Perotti et al. (2012) extensive literature review, which works from Jazairy and Von Haartman (2020) also has. The activities, mentioned in Table 2, are not only applicable to shippers and can also represent activities for green supply chains for e.g. LSPs. The most relevant activities for this study mentioned by Perotti et al. (2012) are distribution network, cooperation with customers, and internal management, and those activities will therefore be further investigated in this study. Development of green distribution strategies means designing logistics systems for higher environmental efficiency with e.g. environmentally friendly facility locations (Perotti et al., 2012). The cooperation activity implies cooperation with partners within the supply chain, for more environmentally friendly distribution networks which leads to less emissions, according to Perotti et al. (2012). Internal management includes cross-functional cooperation activities regarding environmental initiatives, development of sustainable statements, quality of environmental management, and different environmental certifications (Perotti et al., 2012). Additionally, internal information sharing to parts of the

company where decisions that influence the environmental performance are made is an important aspect of green supply chains (Aronsson and Huge Brodin, 2006). The external information sharing process is also an important aspect for companies to enable collaboration between the actors within the supply chain (Ramanathan et al., 2014).

Table 2: The identified activities for a greener supply chains (Jazairy and von Haartman, 2020; Perotti et al., 2012)

Activities for green supply chains	**Examples**
Green supply	Cooperation with suppliers toward more environmentally friendly initiatives
Distribution network	Designing logistics systems for higher environmental efficiency Environmentally friendly facility location Routing systems
Warehousing	Building construction Materials Energy systems and sources
Reverse logistics	Disposal and waste transportation
Cooperation with customers	Cooperation for more environmentally friendly distributions, green packaging, and networking
Investment	Sale of excess capital and used materials
Eco-design	Packaging design Recycle or reuse
Internal management	Top management commitment Cross-functional cooperation regarding environmental initiatives Quality of environmental management Environmental certifications Development of a formal environmental sustainability statement for the company

A key element to competitiveness in green supply chains is improving the decision making process (Cedillo-Campos et al., 2020). Aronsson and Huge-Brodin (2006) argue that in order to reach the full potential of reducing a firm's emissions the environmental issues should be considered at the same level as cost and time. Decision makers must, according to Cedillo Campos et al. (2020), find reliable and good-quality data to be able to not only gain a competitive advantage but also improve the company's sustainable operations. Therefore, it is important to obtain sufficient knowledge to be able to make the right decisions (Škerlič, 2020). One approach to driving green supply chain performance is to use data-driven decision making (Kumar et al., 2020). According to Kumar et al. (2020) data-driven decision making is when a decision within a company is based on data. This approach is, according to Kumar et al. (2020) important within the transportation and freight logistics industry to track the environmental performance. Further, shippers can use data, e.g. emission data, in the planning stage to optimise the supply chain (Cedillo-Campos et al., 2020). The integration of environmental data and benefits into decision-making has enormous potential to promote sustainable development within the supply chain (Kareiva et al., 2015).

4. Task specification

This chapter specifies the purpose further in detail and presents the scope of the study and research questions to assure the right focus. The scope is discussed throughout this section to create a consistent context and understanding. This study is divided into three research questions with associated sub questions which will also be described in this chapter. Lastly, a summary of the presented research questions and sub questions will be presented at the end of this section.

4.1. Scope of study

For this study, emission reporting consists of carbon dioxide equivalents and refers only to emissions related to transportation. Emissions arising from other activities than transportation are therefore not included. Moreover, the literature review points out regulations as an external driver for the implementation of green supply chains. Since countries have their own regulations, it can be hard to find correlations of actions between regulations as a driver. Therefore, this study only concerns the Swedish market and Swedish regulations. For global companies with market shares in both Sweden and other countries, the focus will solely be on the Swedish market.

Another important aspect of this study is why e-commerce companies are interesting to investigate. E-commerce companies have during the last years become a more important shipper (Björklund, 2012). The trend for online purchases is going straight upwards and is expected to grow continuously according to Mucowska (2021) which makes e-commerce companies interesting to study. Additionally, e-commerce companies stand for a significant contribution to the increased demand for freight transportation which is another reason why their transition towards green supply chains is interesting to study. Therefore, only e-commerce companies will be investigated in this study.

To be able to fulfil this study´s purpose it is important to study the supply chain of an e-commerce company. A supply chain can be divided into two streams, upstream and downstream. For e-commerce companies´ the upstream distribution consists of subcontractors and suppliers and the downstream distribution is seen as the activities after e-commerce companies´ first involvement. A generalised system for e-commerce companies´ distribution includes e.g. suppliers, e-commerce companies, and their transportation to customers and drop off points, this generalised system is presented in Figure 4. The scope for this study, marked by the dotted lines in the figure below, includes the downstream distribution for e-commerce companies. The limitation to only study e-commerce companies´ downstream distribution, will simplify the comparison between different companies since these all have a similar distribution. Further, the end customers´ transportation to their pickup location is excluded from this study's scope, since data regarding these transportations can be uncertain and vary, which could therefore create uncertainties for the whole study.

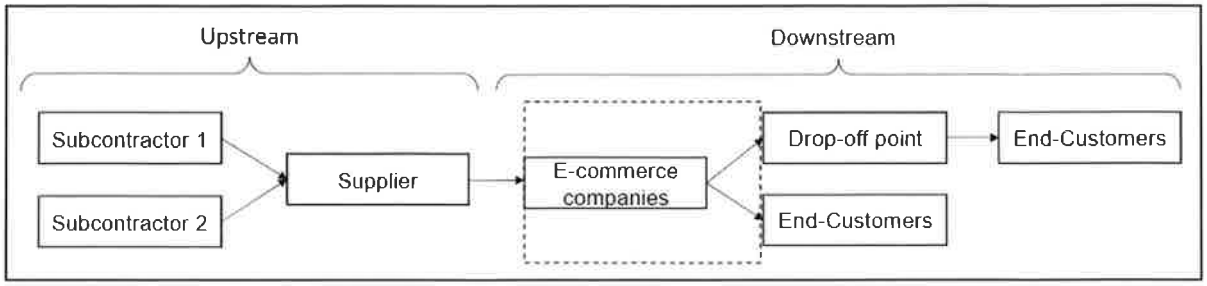


Figure 4: Shows the upstream and downstream distribution flows of an e-commerce company's supply chain and highlights the studied scope for this thesis.

For this study, the logistics activities that affect transportation and emissions from them are interesting to investigate. This study will therefore investigate activities that e-commerce companies have experienced in the transition toward green supply chains that minimise the emissions from the downstream transportation. These emissions, which will be the focus of this study, are a result of e-commerce companies´ downstream transportation. However, these transportations might be affected by activities that can occur from other parts of the supply chain. Some of the studied activities that lead to transportation may affect both internal and external aspects, which might include LSPs, but the central focus of this study is how these activities influence and drive e-commerce companies.

Below is a summarised list of the scope of this study:

- Emissions arising from downstream transportation
- Regulations concerning Sweden
- Swedish-based e-commerce companies
- Activities that affect the emissions from downstream transportation

4.2. Research questions and sub questions

The purpose of this study will be divided into two main areas: green supply chains and supply chain strategies. The area green supply chain aims to investigate companies driving forces for the transition toward green supply chains and the first research question belongs to this main area. The second main area, supply chain strategies, focuses on how green supply chain strategies can affect a company and how decision making within the firm can affect the activities within these green strategies. The second research question will belong to this area. By analysing these two areas together, the third and last research question will be answered, and the purpose will be fulfilled, see Figure 5.

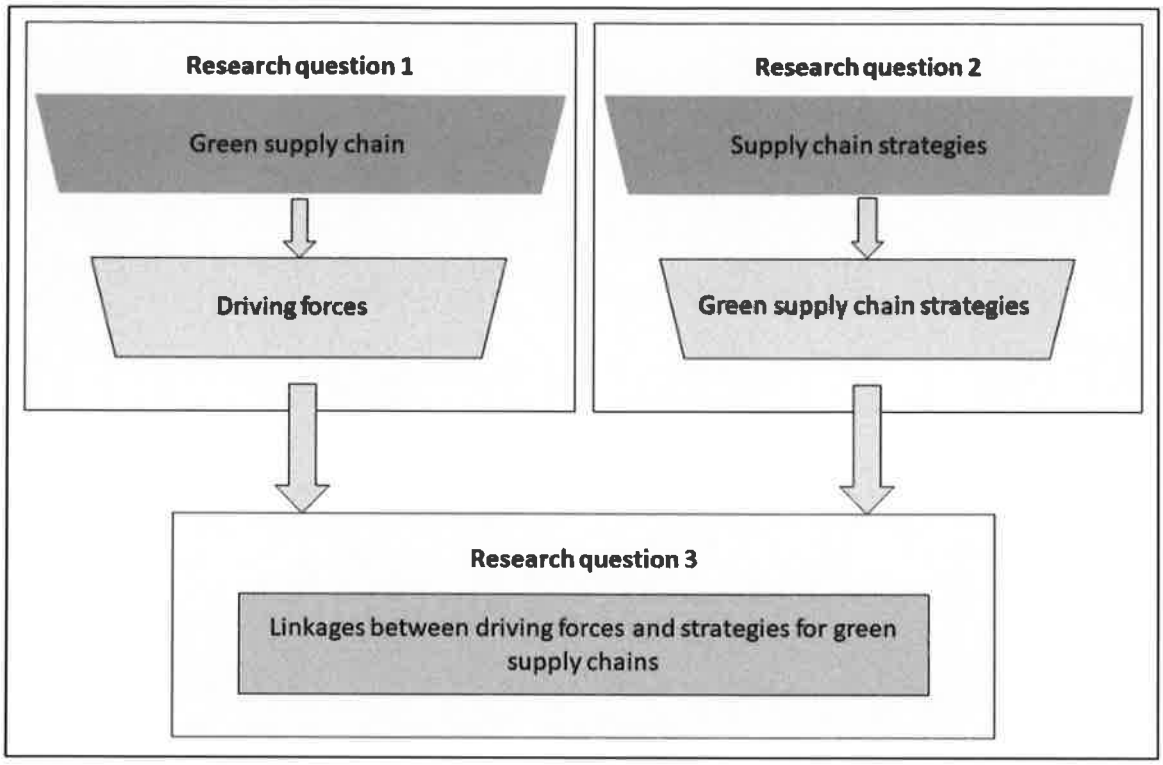


Figure 5: Shows how the research questions fulfill the purpose and the different stages to answer the questions.

Figure 5 showcases that the first research question commits to presenting the different driving forces for the development of green supply chains. The second research question aims to provide an overall view of which strategic areas e-commerce companies experience for the development of green supply chains. Lastly, the third research question aims to combine the results of the previous questions to understand how the driving forces can be linked to the strategic areas for green supply chains. These three research questions will be presented in more detail below. These research questions have been carefully shaped in order to fulfil this thesis objective by using literature from the Frame of reference and Context specification. The purpose of this study, which the questions aim to answer, is presented below.

Identify driving forces for the transition towards green supply chains through e-commerce companies´ strategies.

4.2.1. Research question 1

To fulfil the purpose, Oskarsson et al. (2013) state that knowledge about the studied field is crucial for a successful result. Therefore, it is necessary to understand why the development of green supply chains is interesting for e-commerce companies. National requirements for companies´ environmental performance may increase due to international, and national, goals regarding greenhouse gas emissions (European Commission, 2022b). There are also global reduction targets concerning emissions which has increased stakeholders´ interest in information regarding firms´ sustainability work (Karim et al., 2021). Additionally, globalization has put pressure on the logistics system, which contributes to negative externalities, to improve the ecological quality of

the supply chain (Micheli et al., 2020). All of the above stated pressures result in different reasons why companies might be interested in developing green supply chains. Some of these pressures might be more relevant for some companies, and those extra strong pressures might affect firms' driving forces for the transition towards green supply chains. Therefore, pressures can become a driving force, but they are not synonymous since all pressures do not become a driving force for companies.

To be able to understand the reasons why e-commerce companies transition towards green supply chains it is important to examine the driving forces for firms to measure their environmental performance. Drivers are factors that push organisations to report their environmental sustainability levels (Meager et al., 2020). The literature review identified 12 different driving forces for companies to develop their sustainability work, see the list below.

- Cost reduction
- Target setting
- Attitude of employees
- Environmental awareness
- Innovations
- Customer demand
- Supply chain relations
- Top management support
- First mover advantage
- Competitiveness
- Investors
- Governmental regulations

The reasoning above leads to the first research question.

Q1: How do e-commerce companies experience driving forces for the transition towards green supply chains?

As mentioned above, the literature regarding driving forces for emission reporting and green supply chains reveals different drivers for companies. By conducting a broad literature review, the six most frequently used drivers were identified and they are listed below:

- Cost reduction
- Environmental awareness
- Top management support
- Customer demand
- Governmental regulations
- Competitiveness

Hebaz and Oulfarsi (2021) divides driving forces into two subgroups, internal and external, and describe that companies are driven by them both. It is therefore considered important to evaluate both internal and external drivers in this study. The three most mentioned internal driving forces in the literature were: Cost reduction, Environmental awareness, and Top management support. It is interesting to investigate how these internal driving forces might affect e-commerce companies. To fulfil the purpose of this study it is therefore necessary to understand how e-commerce companies have experienced these identified internal drivers. This leads to sub question Q1A.

Q1A. How do e-commerce companies experience the internal driving forces?

As mentioned earlier, it is important to evaluate both internal and external driving forces for companies to be able to understand why firms choose to develop green supply chains. It is therefore also important to understand the external drivers that affect companies. The most frequently mentioned external driving forces in the literature were: Customer demand, Governmental

regulations, and Competitiveness. Considering this, investigating how the identified external driving forces affect e-commerce companies is interesting to further analyse. Therefore, it is also important to include the external drivers in this study, which leads to question Q1B.

Q1B. How do e-commerce companies experience the external driving forces?

4.2.2. Research question 2

The second research question will be aimed at the area concerning green supply chain strategies. Cetinkaya et al. (2011) state that trying to get a holistic view of the supply chain is often challenging and supply chain strategies can help with that. Cetinkaya et al. (2011) further divide supply chain strategies into four different areas: partners, structures, processes, and systems. These four areas include activities within the supply chain that impact the supply chain's environmental performance. For this study, activities that shippers can change, or influence will be of interest. The supply chain structure and processes are mainly driven by LSPs which makes shippers' influence low. Therefore, only partners and systems will be studied further whereas systems hereafter will be referred to as Internal Management in order to include more activities connected to shippers within this area.

The areas mentioned by Cetinkaya et al. (2011) all include activities that impact the supply chain. Moreover, a study by Perotti et al. (2012) characterized eight activities to apply for greener supply chains; green supply, distribution strategies, warehousing, reverse logistics, cooperation with customers, investment recovery, eco-design, and management. To be able to investigate the connection between strategic areas and green activities, the identified activities will be connected to the strategic areas Partners and Internal Management. Green activities can be measured differently and one way to quantify their environmental impact is by emission reporting. Therefore, it is also interesting to investigate if emission reporting can be integrated with the identified activities. Further, this study will exclusively focus on the activities that shippers can change or influence and the study will therefore also exclude reverse logistics and disposal activities. By combining supply chain strategies from Cetinkaya et al. (2011) and green supply chain activities from Perotti et al. (2012) a model of green supply chain strategies were established, see Figure 6. Partners and Internal Management are identified by Cetinkata et al. (2011) and make up two strategic areas whereas activities from both Cetinkaya et al. (2011) and Perotti et al. (2012) constitute activities for each strategic area.

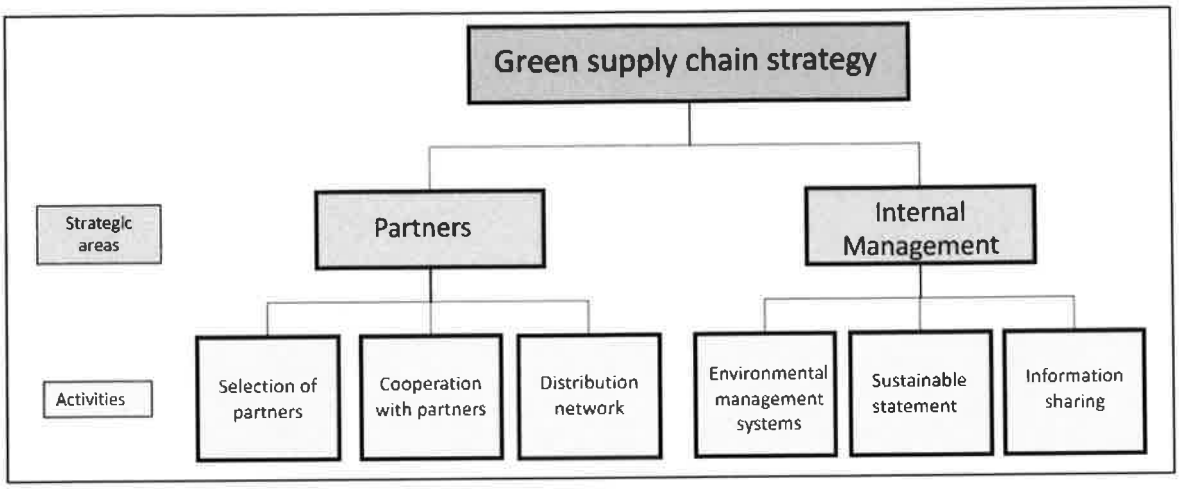


Figure 6: Shows the strategic areas and activities regarding green supply chains for e-commerce companies based on Cetinkaya et al. (2011) and Perotti et al (2012).

The reasoning above leads to that it is important to study which activities within the identified strategic area e-commerce companies have experienced in order to create green supply chains. This leads to question Q2.

Q2. Which of the identified strategic areas have e-commerce companies experienced in the transition towards green supply chains?

Cetinkaya et al (2011) state one part of the strategies for green supply chains that focus on the process of including partners in the supply chain. This is an important aspect of green supply chain practices for e-commerce companies as well since e.g. the logistical service provider highly contributes to the emissions in the downstream part of the supply chain. These emissions can be measured by emission reporting and therefore is the strategic area Partners important for e-commerce companies to successfully work with emission reporting. Further, Björklund and Forslund (2013) imply that the transportation function stresses a critical part of the supply chain. This makes activities, such as partner selection, cooperation with partners, and the distribution network, important aspects to include to be able to study companies' strategic work towards green supply chains. This makes Q2A interesting to investigate.

Q2A. How have e-commerce companies experienced activities within the strategic area Partners?

Another focus area in supply chain strategies is Internal Management. Cetinkaya et al. (2011) describe that supply chain strategies usually include leadership focus and internal information sharing. The involvement of top management is also an important aspect of green supply chains e.g. certifications (Björklund, 2012; Jazairy and von Haartman, 2020). Establishing clear goals for companies to meet is a fundamental part of green strategies and these goals are widely used as a support for decision making which makes the top management even more important for the transition towards green supply chains (McKinnon and Piecyk, 2012). Internal information sharing to parts of the company where decisions that influence the environmental performance are made

is an important aspect of green supply chains (Aronsson and Huge Brodin, 2006). One way to measure environmental performance is through emission data, and therefore is Internal management an important strategy for how e-commerce companies succeed with emission reporting. The reasonings above make activities within Internal Management, such as environmental management systems, sustainable statements, and information sharing, important to study, which leads to Q2B.

Q2B. How have e-commerce companies experienced activities within the strategic area Internal Management?

4.2.3. Research question 3

When information regarding driving forces and strategies for green supply chains are gathered, from the answers of Q1 and Q2, it is considered reasonable to analyse this information. Linkages between strategic decision making and environmental benefits have not been found in the literature review, but Kareiva et al. (2015) identified its potential. Björklund and Forslund (2013) express that emission reporting within the supply chain is an area that has gained increased interest in recent years. Further, Sreekumar and Rajmohan (2018) state that the responsibility to develop green supply chain strategies is shared between all partners in the supply chain. Based on these findings, potential linkage between identified driving forces and strategies for green supply chains will be investigated. This leads to Q3, which aims to analyse information from Q1 and Q2.

Q3. How can the identified driving forces be linked to the identified strategies for the transitions towards green supply chains?

To answer Q3, this study will research linkages between the outcome from Q1 and Q2. Figure 7 below showcases the analysis model for this study and how the identified driving forces from Q1 can be linked to the two strategic areas for green supply chains, from Q2. In practice, this means that for each e-commerce company, internal and external driving forces will be identified. Moreover, which strategic area e-commerce company has experienced in order to transition toward green supply chains will also be examined. The identified driving forces will then be connected to the strategic areas for green supply chains. Q3 will provide a holistic approach to Q1 and Q2 and possible patterns between them will be investigated. To answer Q3, the table in the analysis model below needs to be filled in and analysed.

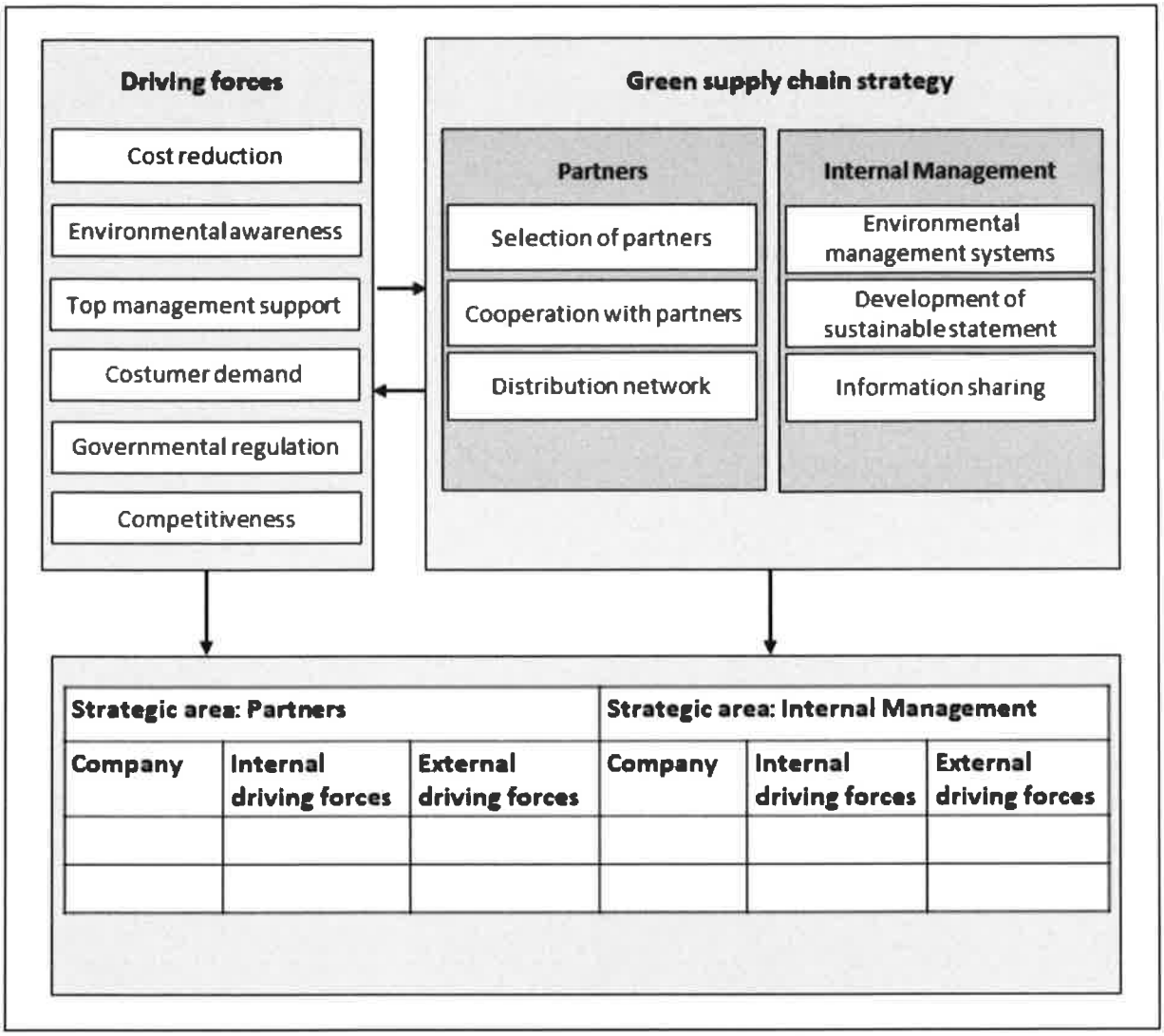


Figure 7: Shows the analysis model for this study.

The e-commerce companies that experienced decision making regarding selection of partners, cooperation with partners, and distribution network is in this study connected to the strategic area Partners. To fill in the table in the analysis model it is therefore important to identify the internal and external driving forces that are connected to companies within this strategic area. This leads to Q3A.

Q3A. How can the internal and external driving forces for e-commerce companies be linked to the strategic area Partners?

The investigated e-commerce companies might also describe decision making regarding the environmental management system, information sharing, and the development of a sustainability statement, which identifies that they have experienced activities within the strategic area Internal Management. To finalise the model, it is therefore also interesting to identify the internal and external driving forces related to the strategic area Internal Management. This leads to Q3B.

Q3B. How can the internal and external driving forces for e-commerce companies be linked to the strategic area Internal Management?

To analyse the completed model, it is of interest to study potential linkages between driving forces and the strategic areas for the transition towards green supply chains. This analysis aims to investigate what drives e-commerce companies to develop green supply chains and in which strategic area these companies implement this. This leads to Q3C.

Q3C. What are the potential linkages between driving forces and strategic areas for e-commerce companies transition towards green supply chains?

Figure 8 summarises the three research questions with the associated sub questions for this study.

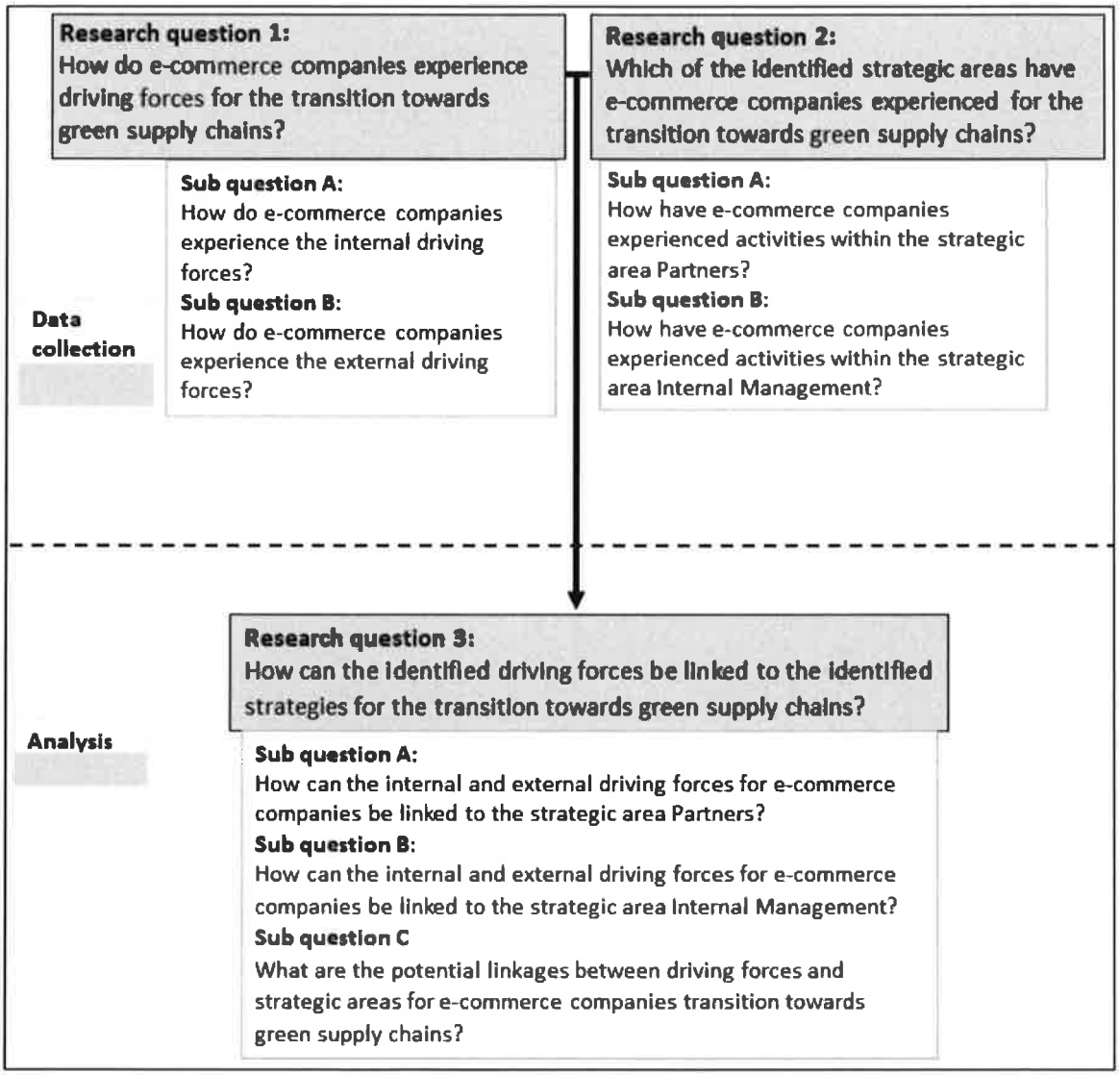


Figure 8: Shows the research questions and sub questions for this study, and also includes in which phase the questions will be studied.

5. Method

This chapter describes the method used to conduct this study. The chapter starts with an overview of the method. Thereafter, the different approaches that were used to answer the research questions will be described.

5.1. Overview of the method

This study was divided into three different phases: planning, data collection, and analysis. These three phases are specifically chosen for this study, but Patel and Davidson (2019) describe that all projects, no matter the subject, can be divided into different steps. The aim of the first phase, planning, was to gather information regarding the thesis subject and the scope of the study. The specification of task was conducted in this phase, as well as the literature review. In the next phase, data collection, information to answer the first two research questions was collected. This knowledge was gathered through primary data collection in interviews. In the last phase, analysis and conclusions were made by analysing the collected information. The phase aimed to answer the last research question and investigate how the identified driving forces are linked to identified logistical strategic areas. The creditability of this study has also been examined in the last phase. These three phases are presented in Figure 9.

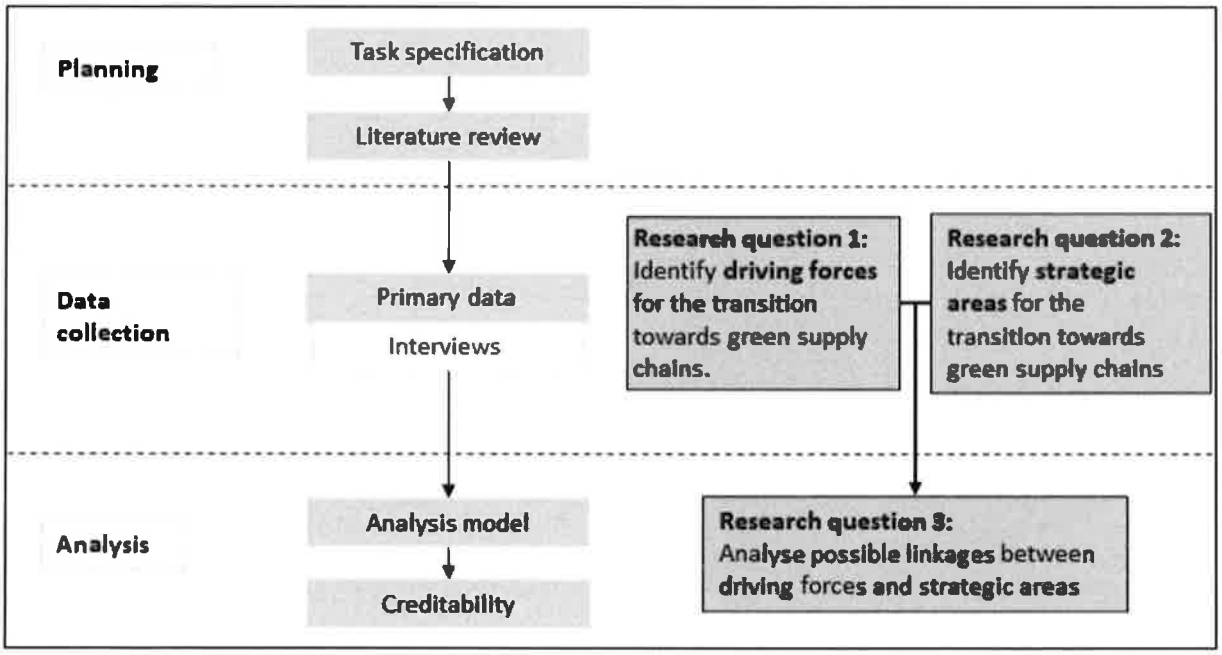


Figure 9: The different phases that were performed in this study were planning, data collection, and analysis.

5.2. Planning phase

In the planning phase for this study, the task specification was conducted and information regarding the studied field was gained. The studied scope was specified as well as the study's aim. The literature review was also performed in this phase. This chapter will describe the methods used for the task specification and the literature review.

5.2.1. Task specification

The specification of task was created together with the partnering company and the supervisor from Linköping University. The partnering company presented three articles that laid the foundation for the specification of task for this study. The articles given were meant to help to define the study's scope and to elaborate the literature review to get a deeper knowledge of related areas. The articles given to the authors were:

- Setting targets for reducing carbon emissions from logistics: current practice and guiding principles (McKinnon and Piecyk, 2012)
- Incentives for subcontractors to adopt CO_2 emission reporting and reduction techniques (Scholtens and Kleinsmann, 2011)
- Carbon disclosure strategies in the global logistics industry: Similarities and differences in carbon measurement and reporting (Herold and Lee, 2018)

These articles were studied and discussed. If the authors would have started with different articles the outcome of the task specification might have been different.

5.2.2. Literature review

The theoretical framework conducted in the literature review should constitute and describe information about the researched areas based on the studied purpose (Björklund and Paulsson, 2012; Patel and Davidson, 2019). For the performed literature review in this study, most of the literature has been derived from both academic journal databases, such as Unisearch and Google Scholar, but also scientific book publications. To make this study as objective as possible, the authors avoided loaded language and tried to describe the collected information as close to the source as possible.

When searching for articles through Unisearch database, peer-reviewed articles were selected. The literature review started with general searches for a wide approach, e.g. green supply chain and supply chain strategies, and gradually the searches got more specified. The literature search was divided into two areas, green supply chain and supply chain strategies, and the performance to search for articles was the same for both areas. The most used keywords for the two literature review areas were green supply chain, emission reporting, and logistical strategies. These keywords were chosen to reflect the purpose of the study. A complete summary of the chosen keywords and the combinations of keywords is presented in Table 3. For this study, it has not been possible to review all articles after combining keywords. Duplicates and obvious irrelevant articles were excluded as well as articles written in languages other than Swedish or English. Therefore, articles and different viewpoints can have been missed. Articles were sorted after the

published date and abstracts were thereafter read for those articles with titles suitable for the purpose. To sort articles based on the published date was seen as important especially for green supply chain since this subject area has gotten more focus the recent years (Córdova et al., 2018). The full article, or large parts, were reviewed when significant important information was found in the article's abstract. Throughout the literature review, the reference list of appropriated articles was used together with citations to identify additional papers. This systematic mapping approach is called snowballing (Wohlin, 2014). It is argued that the benefits of a snowballing approach outweigh the risk of the author unintentionally limiting the study (Wohlin, 2014).

Table 3: Showcase keywords used for the literature study and how the keywords have been combined. The number of results is gathered from Unisearch

Keywords and combined keywords	**Number of results**	**Subject area (Q1 and Q2)**
Green supply chain	25 506	Q1
Green supply chain and emission reporting	23	Q1
Green supply chain and driving forces	110	Q1
Green supply chain management	17 308	Q1
Driving forces and emission reporting	19	Q1
Sustainable supply chain management, driving forces	111	Q1
Supply chain management and logistics strategy	10 859	Q2
Supply chain strategy	55 582	Q2
Green supply chain strategy	5 482	Q2
Supply chain strategy and decision making	5 690	Q2
Supply chain management and decision making and data-based	21	Q2

The search for relevant books to read was based on both Swedish and English keywords and mainly found at a University Library. The literature reviewed from books found has mainly contributed to knowledge about basic concepts and models. This goes in line with Patel and Davidson's (2019) statement that theories and methods are more easily found in books while articles contribute with the most updated information. Findings from scientific book publications have also been used to strengthen the foundation of the theoretical framework and methodology. The majority of books used have been written within the logistic and strategic fields. Some of these were known to the authors before conducting this study, while others were found during the literature review. Books within logistics have also been found by searching for authors that were commonly mentioned in useful articles. Further, methodological book publications were used for conducting the chapter method.

5.3. Data collection

For this study, primary data collection was used. Data that is collected for this specific research problem are called primary data (Hox and Boeije, 2005). Hox and Boeije (2005) explain that every time primary data is collected, new data are added to the existing store of knowledge. This already existing knowledge is information that researchers made available to the research community and is called secondary data (Hussey and Hussey, 1997). An example of secondary data is collected documents from companies (Hussey and Hussey, 1997), something that was not needed to answer this study's purpose. For this study, data has been collected from the literature review but also from interviews, which are classified as primary data and will be further described in the section below (Hox and Boeije, 2005).

5.3.1. Primary data

Primary data is data that origins from an original source. One advantage of this type of data collection is, according to Hox and Boeije (2005), that the data collection strategy can be tailored to the research questions which can ensure that the gathered data helps to solve the problem. On the contrary, one disadvantage of primary data is that it is costly and time consuming. Interviews are the primary data collection method for this study.

Interviews

A major part of the data collected for this thesis was gathered through interviews. Interviews are flexible and motives can be expressed more vividly compared to other data collection alternatives, e.g. surveys, which is beneficial with interviews (Bell, 2016). Moreover, there are also negative aspects to interviews. To perform high quality interviews is usually time consuming and interviews are, to some extent, built on subjective techniques which increase the risk of bias and decrease their validity (Bell, 2016).

There are different types of interviews, structured, semi-structured, and unstructured. For structured interviews, all questions are set beforehand and are asked in a definite order while unstructured interviews have the shape of an ordinary conversation without predefined questions (Björklund and Paulsson, 2012). Both these interview types, structured and unstructured, are considered inappropriate for this study. The authors wanted to have the flexibility to ask supplementary questions during the interview, why structured interviews would be inappropriate. Moreover, Bell (2016) argues that unstructured interviews require an experienced interviewer and that the analysis is often time consuming and complex, which is why unstructured interviews were seen as unsuitable for this study. Semi-structured interviews indicate that questions have been pre-defined and that follow up questions are welcome, but also that the respondent can shape the conversation and lead it in different directions (Patel and Davidson, 2019). This method was seen as most appropriate because the authors wanted the possibility to follow up with questions depending on the correspondents´ answers, something that Björklund and Paulsson (2012) point out is possible with semi-structured interviews. Semi-structured interviews can therefore help to deepen and develop the answers given according to Bell (2016) and this type was therefore used for all interviews performed.

How questions are asked can contribute to either high or low validity. To obtain high validity, the interview questions for this study were designed in compliance with recommendations by Patel and Davidson (2019). The interview questions and sub-questions can be reviewed in Appendix A – interview questions. Interviews in person were not possible to conduct and therefore video interviews were performed. Video interviews are seen as the interview type most similar to face-to-face interviews (Saarijärvi and Bratt, 2021). On the other hand, while performing video interviews it became harder to read and analyse body language. Björklund and Paulsson (2012) argue that body language is an important part of the communication and therefore, by using video interviews, some signals can have been missed. To increase the reliability and make sure the interviews got correctly narrated, both authors were present at all interviews and the interviews were summarised afterward. The summary was performed in order to code the given answers depending on which research questions the information concerned. This was performed to help to structure and organize the results.

Before all interviews, consent to record was given from all respondents. The interviews were performed in Swedish and recorded to be able to verify the data collected afterward but also to be able to fully focus on the respondent during the interview. The answers from the respondents were later translated to English in the result. One drawback with recording the interviews is that the respondent may overthink what to say and not tell the whole truth. To overcome this issue, the authors thoroughly explained what the data would be used for and how the information would be handled, an approach Patel and Davidson (2019) mentioned as important. At the beginning of the interviews, the authors informed the respondent that they could end the interview whenever they wanted and that they will be allowed to examine their contribution to the study. All of the respondents from the interviews were in this study anonymous which reduced the risk of the respondents being identified. Consent is particularly important when personal data is being saved according to the law of GDPR. The personal information gained about the respondents was held confidential and deleted after the study. This is in line with the information requirement, the confidential requirement, the consent requirement, and the utilization requirement which are the four ethics requirements mentioned by Patel and Davidson (2019) and Blomkvist and Hallin (2014).

The respondents interviewed all had connections to e-commerce companies and held positions regarding the company's sustainability or logistics work, see Table 4. The respondents had extensive knowledge about the company's drivers for emission reporting and the strategic work towards green supply chains. Therefore, all performed interviews concerned both research questions 1 and 2, and one interview per respondent was conducted. The e-commerce companies interviewed were operating in the Swedish market. There were no limitations regarding what products the companies sold, as long as the trading was handled online. The authors contacted each respondent and every company contacted, and respondent interviewed, has been confidential for this study.

Table 4: A list of the interviewed companies and their revenue for the year 2020 gathered from Allabolag[1]

Type of company	Reference name	Revenue > 1 billion SEK
Swedish based online beauty retailer	Company A	No
Swedish based IT retailer	Company B	Yes
Swedish based online pharmacy retailer	Company C	Yes
Swedish based online pharmacy retailer	Company D	No
Swedish based online beauty retailer	Company E	Yes
Swedish based online lifestyle brand	Company F	No

5.3.2. How to answer research question 1 and 2

Research question 1 aimed to investigate the driving forces for e-commerce companies to develop green supply chains. The focus of research question 2 was to study which strategic area e-commerce companies have experienced in order to develop green supply chains. These two research questions were investigated at the same time, and they both needed to be answered before research question 3 could be studied. Therefore, data collection of primary data was collected to answer the first two questions. In this section, the method of how to answer Q1 and Q2 is presented.

Q1: How do e-commerce companies experience driving forces for the transition towards green supply chains?

The first research question investigated the driving forces for the transition towards green supply chains for e-commerce companies. The literature revealed that there are internal and external driving forces for companies and both types of drivers were necessary to answer Q1. To be able to identify the most frequently mentioned drivers from the literature triangulation has been used. Hussey and Hussey (1997) describe triangulation as a combination of methodologies that study the same phenomenon. For this study, data triangulation has been used to identify driving forces, since data were collected from different sources (Hussey and Hussey, 1997). The triangulation began with the sources received from the partnering company, and afterward, supplementary sources that studied the same phenomenon were collected through the literature review. Some of the studied articles mentioned driving forces with the same name that is used in this study, but some of the articles used different words to describe the same driver. These driving forces, mentioned with different names, were classified by the authors to match the already collected information. Further, the authors aimed to collect information regarding driving forces that were independent of each other and not based on the same source to maintain credibility. Therefore, the sources were not collected through snowballing to avoid connections between the articles.

The articles used for the triangulation concerned driving forces for both green supply chain and emission reporting in order to include two perspectives and hence, gain a wider perspective of

[1] www.allabolag.se

driving forces within logistics. The literature divided the driving forces into internal and external and it was therefore interesting to investigate which of the identified internal and external driving forces e-commerce companies had experienced. This led to Q1A and Q1B.

Q1A. How do e-commerce companies experience the internal driving forces for the transition towards green supply chains?

To study the internal driving forces for e-commerce companies, it was necessary to investigate the internal drivers mentioned in the literature. These identified driving forces helped the authors design questions for the interviews with e-commerce companies that were conducted to identify which internal drivers the company had experienced. To answer this sub question, the internal driving forces were investigated by the following questions:

Q1A.1 Which internal driving forces are identified in the literature?

Q1A.2 Which internal driving forces have e-commerce companies experienced?

Q1A.3 Which of the identified internal driving forces have e-commerce companies experienced?

The literature review was used to answer Q1A.1, where articles regarding internal driving forces for emission reporting and green supply chain were investigated to identify the most frequently mentioned internal driving forces in the literature. The triangulation helped the authors to identify the most mentioned internal drivers and to answer Q1A.1.

To answer Q1A.2 and Q1A.3, semi-structured interviews were conducted in order to investigate the driving forces that e-commerce companies had experienced in the transition toward green supply chains. To answer Q1A.2 the interviews started with a broad opening question regarding internal driving forces, where the respondent got the opportunity to talk freely about experienced driving forces. The reason for this broad opening question was to enable the respondent to mention internal driving forces not identified in the literature review.

Thereafter, the authors presented the most frequently mentioned internal and external forces from the literature and the respondents were asked to prioritise these after the company's experiences. The respondents were free to prioritise the presented drivers however they liked and additional driving forces could be added. The respondent was able to prioritise two or more driving forces as equally important, but they were asked to motivate their prioritising. This was done to connect the literature result with the respondents' answers and to identify which of the internal driving forces from the literature e-commerce companies had experienced. This approach answers Q1A.3.

Q1B. How do e-commerce companies experience the external driving forces for the transition towards green supply chains?

To be able to answer Q1, it was also necessary to investigate the external driving forces for e-commerce companies for the development of green supply chains. Firstly, the external driving forces mentioned in the literature were investigated. This was conducted in order to create interview questions to investigate how e-commerce companies had experienced external driving forces. Secondly, it was interesting to investigate how e-commerce companies had experienced

the most frequently mentioned external driving forces from the literature review. Therefore, the following questions needed to be answered:

Q1B.1 Which external driving forces are identified in the literature?

Q1B.2 Which external driving forces have e-commerce companies experienced?

Q1B.3 Which of the identified external driving forces have e-commerce companies experienced?

The first question, Q1B.1, was answered through the literature review, where the most frequently mentioned external driving forces in the literature were identified through triangulation.

The conducted interviews were used to answer Q1B.2 and Q1B.3. The interviews were used to identify if e-commerce companies had experienced external driving forces for the development of green supply chains. A broad opening question was asked to answer Q1B.2 and the purpose of this question was to be able to identify external driving forces not found in the literature review.

To answer Q1B.3, the most frequently mentioned driving forces in the literature were presented to the respondent who was asked to prioritise them after the company´s experience. The respondent was able to prioritise two or more driving forces as equally important, but they were asked to motivate their prioritising. This prioritising was conducted in order to connect the respondents´ answers with the literature result and to identify which of the external driving forces the e-commerce company had experienced. This answers Q1B.3.

Q2: Which of the identified strategic areas have e-commerce companies experienced for the transition towards green supply chains?

The second research question aimed to investigate the strategic area e-commerce companies experience when developing green supply chains. The literature review revealed that Cetinkaya et al. (2011) explained that e-commerce companies´ strategic work toward green supply chains can be grouped into different areas where two of them could be influenced by shippers: Partners and Internal Management. These strategic approaches were chosen because they could be applied to shippers´ strategic work and could include emission reporting, which was relevant for this study. To be able to investigate if e-commerce companies had experienced any of these two strategic areas, it was important to study the activities connected to each strategic area. This led to Q2A and Q2B.

Q2A. How have e-commerce companies experienced activities within the strategic area Partners?

To answer Q2A, it was important to understand which activities the strategic area Partners include. Further, it was also vital to understand which of these activities e-commerce companies had experienced and if any of these activities included emission reporting. Therefore, the following questions were interesting to investigate:

Q2A.1 Which activities are included in the literature regarding the strategic area Partners?

Q2A.2 Which of the activities that are connected to the strategic area Partners have e-commerce companies experienced for green supply chains?

Q2A.3 Which of the experienced activities connected to the strategic area Partners includes emission reporting?

To answer Q2A.1, the authors identified activities from Cetinkaya et al. (2011) and Perotti et al. (2012) during the literature review that could be linked to the strategic area Partners. Activities within this strategic area refer to shippers´ collaboration with partners within the downstream part of the supply chain. These articles were found during searches for strategies concerning the development of green supply chains. Cetinkaya et al. (2011) and Perotti et al. (2012) both presented several activities concerning green supply chains. For this study, activities that shippers could change or influence regarding the strategic area Partners were selected.

The semi-structured interviews that were conducted with e-commerce companies were used to answer Q2A.2 and Q2A.3. During the interviews, the authors presented the identified activities for both the strategic areas Partners and Internal Management. The respondents were asked to explain which activities had been most important for their development of green supply chains. Further, the respondents were asked to explain decisions the company had made regarding the activities. If decisions concerning one or more of the activities connected to Partners had been made, the conclusion was made that the e-commerce company had experienced the strategic area Partners, and Q2A.2 has then been answered. Lastly, questions were asked regarding if any of the experienced activities included emission reporting, which answers Q2A.3.

Q2B. How have e-commerce companies experienced activities within the strategic area Internal Management?

The activities within the strategic area Internal Management were important to understand to be able to answer Q2B. Another important aspect regarding these activities was to understand if they had influenced e-commerce companies´ strategic work towards green supply chains and if they included emission reporting. This led to investigating the following questions:

Q2B.1 Which activities are included in the literature regarding the strategic area Internal Management?

Q2B.2 Which of the activities that are connected to the strategic area Internal Management have e-commerce companies experienced for green supply chains?

Q2B.3 Which of the experienced activities connected to the strategic area Internal Management includes emission reporting?

By studying the articles by Cetinkaya et al. (2011) and Perotti et al. (2012), activities for e-commerce companies within the strategic area Internal Management could be selected, in order to answer Q2B1. This strategic area includes internal activities that can be affected by the management. The selected activities were activities that e-commerce companies could influence or change.

Q2B.2 and Q2B.3 were answered through semi-structured interviews with e-commerce companies. Questions were asked regarding if decisions had been made concerning the activities connected to Internal Management. If the company answered that decisions concerning one or

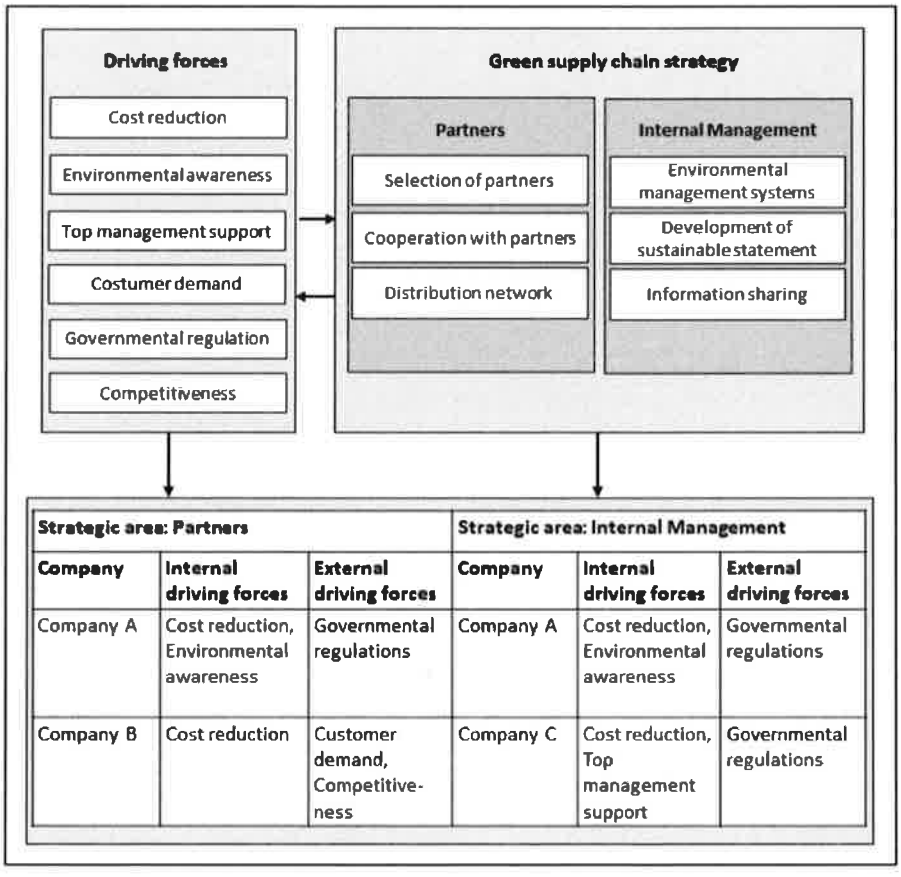
more of these activities had been made, the conclusion was made that the e-commerce company had experienced the strategic area Internal Management, and Q2B.2 has then been answered. Further, questions regarding if emission reporting was included within any of the experienced activities were asked, which answers Q2B.3.

5.4. Analysis

The section below will explain how information from Q1 and Q2 were analysed and used when answering research question 3. The analysis model was used when analysing the answers from Q1 and Q2 and this will be explained, as well as a detailed explanation of how Q3 was answered.

5.4.1. Analysis model

When Q1 and Q2 were answered, the gathered information was analysed according to the analysis model. Here, information from both the literature review and the semi-structured interviews conducted with e-commerce companies were analysed together. The collected data were analysed with the analysis model and Figure 10 showcases an example of how collected data could be included in the model. The analysis model was used to answer Q3, which is further explained in the section below.



Strategic area: Partners			Strategic area: Internal Management		
Company	**Internal driving forces**	**External driving forces**	**Company**	**Internal driving forces**	**External driving forces**
Company A	Cost reduction, Environmental awareness	Governmental regulations	Company A	Cost reduction, Environmental awareness	Governmental regulations
Company B	Cost reduction	Customer demand, Competitive-ness	Company C	Cost reduction, Top management support	Governmental regulations

Figure 10: An example of what the analysis model can look like when completed with data derived from Q1 and Q2.

Q3: How can the identified driving forces be linked to the identified strategies for the transition towards green supply chains?

Research question 3 aimed to investigate how the driving forces could be linked to strategic areas for the development of green supply chains. The answers from Q1 and Q2 needed to be connected and analysed by the analysis model in order to answer Q3. Therefore, Q3A and Q3B were needed to connect the identified driving forces with the strategic areas, and Q3C was necessary to be able to analyse this and fully answer research question 3.

Q3A. How can the internal and external driving forces for e-commerce companies be linked to the strategic area Partners?

To answer Q3A, the identified internal and external driving forces for e-commerce companies needed to be linked to the strategic area Partners. All three columns under the strategic area Partners in the analysis model needed to be filled in. To answer Q3A and to fill in the analysis model, the following questions needed to be answered.

Q3A.1 Which internal driving forces for e-commerce companies can be linked to the strategic area Partners?

Q3A.2 Which external driving forces for e-commerce companies can be linked to the strategic area Partners?

To answer Q3A.1 and Q3A.2, the result from Q1B and Q2A needed to be combined. To do so the driving forces for the companies that had experienced the strategic area Partners in Q2A needed to be further analysed. The three drivers with the highest priority from the interview were selected and included in the analysis model. In instances where two or more driving forces got the same prioritisation, the respondents´ motivation was used to choose the top three driving forces. These three drivers were categorised into internal and external drivers in the analysis model, see the example in Figure 10. This answered both Q3A.1 and Q3A.2.

Q3B. How can the internal and external driving forces for e-commerce companies be linked to the strategic area Internal Management?

To answer Q3 it was also important to understand which driving forces can be linked to the strategic area Internal Management. To identify the driving forces connected to Internal Management, all columns under the strategic area Internal Management in the analysis model needed to be filled in. To do so, the questions below needed to be answered.

Q3B.1 Which internal driving forces for e-commerce companies can be linked to the strategic area Internal Management?

Q3B.2 Which external driving forces for e-commerce companies can be linked to the strategic area Internal Management?

The results from research questions 1 and 2 needed to be combined in order to answer Q3B.1 and Q3B.2. Q2B determined which companies had experienced the strategic area Internal Management and the driving forces for these companies needed to be analysed further. To do so, the top three drivers from the prioritisation were selected and included in the analysis model, see example

Figure 10. In instances where two or more driving forces got the same prioritisation, the respondents´ motivation was used to choose the top three driving forces. In the model, the drivers were categorised into internal and external driving forces which answered Q3B.1 and Q3B.2.

Q3C. What are the potential linkages between driving forces and strategic areas for e-commerce companies to transition towards green supply chains?

When the table in the analysis model was filled in, see example in Figure 10, the result needed to be further analysed to fully answer Q3. It was, therefore, necessary to analyse possible patterns and similarities between the identified driving forces and the strategic areas for e-commerce companies. This was done by evaluating the analysis model conducted from Q3A and Q3B and previous literature.

5.5. Achieving credibility

In all phases of this study, credibility was important. A study´s credibility can, according to Björklund and Paulsson (2012) be measured by reliability, objectivity, and validity. Reliability describes how likely it is that the same result will occur if the study is repeated (Björklund and Paulsson, 2012). The level of random errors can be measured with reliability (Larsen, 2019) Objectivity measures if any valuations are affecting the study (Björklund and Paulsson, 2012). Björklund and Paulsson (2012) explain that this aspect describes how well sources have been described correctly and how well personal opinions have been excluded. The last aspect of credibility, validity, defines how well the study is measuring what it is supposed to measure (Larsen, 2019). Validity measures how well-founded the conclusions are and how questions are formulated in order to fulfil the purpose of the study.

This study strived to achieve as high creditability as possible and therefore, all three aspects mentioned above were central throughout this study. One example of this was the triangulation that was made to verify the identified driving forces which increased the reliability and validity (Björklund and Paulsson, 2012). All of the collected articles for the triangulation mentioned at least two driving forces that have been described by another author and many of the identified driving forces was recurrent in the literature. This suggested that the articles point in the same direction which can strengthen the trustworthiness of the result from the triangulation (Skärvad and Lundahl, 2016). Further, the interview questions were designed to be as clear as possible in order to ensure distinct answers from the respondent. Also, both authors were present during all of the executed interviews to reduce the risk of data being misinterpreted which might improve the study´s objectivity. Further, the type of interview chosen for this study was semi-structured with follow-up questions, which increased the understanding of the collected data and also increased the validity and reliability of the study. All of the interviews were recorded to ensure that the authors could relisten to the answers given and thereby also verify the collected data.

6. Answering research question 1

This chapter aims to answer research question 1 and he data collection is presented and analysed. For this chapter, all information is collected through the conducted interviews. The transition towards green supply chains concerns minimising emissions from transportation in the downstream part of the supply chain.

Q1: How do e-commerce companies experience driving forces for the transition towards green supply chains?

6.1. The experienced driving forces

To answer research question 1, the result from the interviews regarding e-commerce companies' driving forces for the transition of green supply chains will be presented. The answers in this chapter are grouped into internal and external drivers.

6.1.1. The experienced internal driving forces

In the Frame of reference, the following internal driving forces for the transition towards green supply chains were identified: Cost reduction, Environmental awareness, and Top management support. These internal driving forces were also identified as important for the interviewed companies.

Company A, Company D, and Company F talked during their interviews about Cost reduction being a driver for their transition towards green supply chains. Company A explained that they aimed to have less air in each package to minimise costs from the used materials and transportation needed, something Company D also addressed by saying that they worked with optimising product packages. When smaller packages are sent, the fill rate can increase and the number of transports needed can decrease, according to both Company A and Company D. Company D also talked about Cost reduction being the most problematic driving force since it can be both a driving force and a barrier. Company F said that it is hard to include sustainability in the organisation if it does not lead to profitability. The respondent from Company F further explained that profitability is their main focus and other matters, including sustainability, should not affect the company's finances negatively in order to be adopted.

Environmental awareness was seen as a driver for all companies interviewed except for Company A and Company D. Company B said that they had tracked all of their emissions and therefore knew how their organisation impacted the environment. The respondent from Company B further explained that this knowledge made the company thrive to minimise its total environmental impact. Company C and Company F explained that they are aware of their negative effect on the environment and therefore want to reduce their impact. Additionally, Company C commented that their corporate social responsibility work (CSR) and willingness to do more than they are obliged

to do also could be seen as a driver toward more sustainability. The respondent from Company E elaborated on this hypothesis and said that they think that it is important to think about how their actions affect future generations. The respondent from Company E also explained that they want to minimise their impact on the environment and if that means that the company cannot deliver their products to some parts of the country, then that is a consequence they need to accept in order to be more sustainable. Company E further explained that they think that it is more important to care about the earth rather than deliver their products right outside a customer's door.

The interviews also resulted in Top management support being mentioned as a driver for all companies, except for Company D who did not mention it as a driver. Company A described that their top management thinks that it is important to include the sustainability aspect into the company and sustainability is, therefore, something they are working with. Company B, Company C, Company E, and Company F all said the same thing and that they are, due to the support from their top management, able to work with sustainability to the extent they are. The respondent from Company C also described that their CEO prioritises sustainability and wants to include sustainability activities in all departments of the company. Further, Company F mentioned that their business owners want to develop their sustainability work, and they do therefore act as a strong driving force for the company.

In contrast with the top-down perspective mentioned above, Company F also mentioned the bottom-up perspective as a driving force. They said that a driver for them to include sustainability in their work are arising from their employees. The respondent from Company F explained that candidates often highlight sustainability as an important question for them during job interviews. This leads to that it is important, according to Company F, to include sustainability in their organisation to be able to attract new employees to the company.

6.1.2. The experienced external driving forces

The following external driving forces for the transition towards green supply chains were identified in the frame of reference: Customer demand, Governmental regulations, and Competitiveness. These driving forces were also mentioned in the interviews as important for the companies.

During the interview with Company A, the respondent described that sustainability actions are necessary and essential for their customers. Company A therefore mentioned that their customers assume that a company includes sustainability into their organisation and thinks their customers can act as a driving force for them. Further, the respondents from Company B, Company C, Company D, and Company E did also explain that sustainability is important for their customers, and they think that sustainable activities are necessary to satisfy their customers. However, Company D explained that they lacked data on how important customer demand is for them and that it was therefore hard to define how strong this driving force was to them. The respondent from Company F said that the customers are always their main focus, and Customer Demand is, therefore, a strong driving force for them.

In the interview, Company A also mentioned that it is important that there are governmental regulations that support a company's sustainability work. Therefore, Company A explained that Governmental regulations are a driving force for them. Additionally, the respondent from

Company B explained that if you do not do things right now, they might become more expensive in the future. Company F said that Governmental regulations need to be the main priority for their company because all companies have to obey them.

Company B, Company C, and Company D described that Competitiveness is an important driving force for them. Company B described during the interview that sustainable actions are necessary for them to be competitive in the future. Company C and Company D also mentioned that sustainability is important for a company's competitiveness and to become a sustainable company. Company E described that they do not only include sustainability into their organisation to become more competitive but that they wanted their competitors to follow their actions in order to change the whole industry for the better.

During the interview Company B did also point out investors as a driving force for their company's work towards a greener development. The environment is a more important question nowadays for investors, according to Company B, compared to just a few years ago and solid environmental work is therefore seen as crucial in order to gain new investments.

6.2. Analysis of the experienced driving forces

In this section, the information above regarding experienced driving forces by the interviewed companies is discussed and analysed. The chapter will start with an analysis of the prioritisation from each respondent and later all driving forces will be analysed together. The full prioritising from the companies can be seen in Appendix B.

6.2.1. The prioritisation of driving forces

When Company A was asked to prioritise the identified driving forces from the literature, the respondent prioritised Cost reduction as the most important driving force for their company. The respondent prioritised Top management support as the second most important and the third was Governmental regulations. The respondent mentioned that it is necessary to include Customer demand in a company and since this driving force is vital, the respondent could not prioritise the driver. Company A was the only company interviewed that prioritised Cost reduction as one of the top three most important driving forces, even if Cost reduction was mentioned ten times in the literature review, e.g. by Walker et al. (2008), and Meager et al. (2020). It is hard to know the exact reason for this, but Company A was one of the smaller interviewed companies and the authors got the impression that Company A was at the start of its sustainable development. Smaller companies might have a harder time seeing the benefits of including sustainability in the organisation compared to bigger companies (Perotti et al., 2012). This might be one reason why Company A has not started their development of green supply chains earlier and why they prioritised Cost reduction high.

The prioritisation from Company B showed that Top management support and Environmental awareness are most important for them which were prioritised highest and Competitiveness a bit further down. Company B also expressed that they are partly driven by investors that put pressure on their environmental work. This aspect did no other company mention but there are reasons to

expect that many of the companies that have investors will be partly driven by their demands, something Walker et al. (2008) argue that Investors might pressure firms to increase their profit on a sustainable way by developing environmental policies (Walker et al., 2008). If Investors would have been identified as one of the most common driving forces from the literature, more companies might have mentioned it as a driving force and their prioritisation might have been different as well.

When Company C was asked to prioritise the identified driving forces from the literature the respondent prioritised Top management support and Environmental awareness as the most important driving forces for their company. Further, the respondent prioritised Customer demand and Competitiveness at the same place as the second most important driving force. The impression from Company C was that it was more important to fulfil customers´ demand to be competitive and therefore, Customer demand was seen as the stronger driver of the two.

The prioritisation from Company D showed that Competitiveness was seen as the most influential driver and said that in order to be competitive today you need to be sustainable. The respondent also ranked Environmental awareness high since it is where everything begins according to them and lastly, the respondent from Company D ranked Customer demand as third. Company D did also mention that Cost reduction is hard to prioritise as a driver because it could also act as a barrier. Further, Company D also mentioned that Governmental regulations concerned LSPs more than shippers which also can be a reason why most of the interviewed companies did not prioritise this driving force.

Company E ranked Environmental awareness as the most important driving force for them while the literature review shows that Environmental awareness was only mentioned five times e.g. Hebaz and Oulfarsi (2021) and Scholtens and Kleinsmann (2011). Additionally, the respondent from Company E mentioned that Customer demand and Top management support are also important for their transition towards a green supply chain.

When Company F was asked to prioritise the driving forces did the respondent say that Top management support is the strongest driving force for them. Secondly, Company F prioritised Customer demand and Competitiveness at the same place. The respondent also mentioned that Governmental regulation cannot even be prioritised because companies must obey them, and it can therefore not be seen as a driving force. Another interesting aspect of the conducted interview was that Company F mentioned employees as a driving force. From the Frame of reference was Employees mentioned as a driver by Björklund and Forslund (2013), Walker et al. (2008), and Oberhofer and Dieplinger (2014) but since this driver was not among the most mentioned ones, it was not chosen as one of the six identified driving forces. The respondent from Company F mentioned that they had noticed that the employees´ attitude regarding sustainability is changing and that it is a more important question for many of them. The respondent also explained that they had noticed that the employees affect their company and that they to some extent drive the company's sustainability work forward. This is something that correlates with Björklund and Forslund (2013) which explain that the development of green supply chains can be dependent on the employee's knowledge and awareness. The literature also highlighted that environmental improvement can be positively related to the employees´ involvement (Walker et al., 2008), which

also is something that corresponds with the answers from Company F. If Employees would have been identified as one of the most important driving forces from the literature, is it possible that more companies would have highlighted this driving force as important for the transition towards green supply chains.

The three most experienced drivers from each company are shown in Table 5 below. Chapter 5 described that the three highest prioritised driving forces for each company should be included in the analysis model. The strongest driving force was in Table 5 marked as one (1) and the weakest, of these three, marked as number three (3).

Table 5: A summation of the most experienced driving forces for each interviewed company. In cases where two driving forces were prioritised at the same level, they were marked with the same number

	Internal driving forces			External driving forces		
	Cost reduction	Environmental awareness	Top management support	Customer demand	Governmental regulations	Competitiveness
Company A	1		2		3	
Company B		2	1			3
Company C		1	1	2		2
Company D		2		3		1
Company E		1	3	2		
Company F			1	2		2

6.2.2. Linkages between the companies driving forces

Table 5 shows that the internal driving forces were higher prioritised by most of the interviewed companies compared to the external driving forces. This indicates that the internal driving forces, such as Environmental awareness and Top management support, act as stronger drivers for the studied companies compared to external factors such as Governmental regulations and Customer demand. On the contrary, Customer demand and Competitiveness were mentioned by as many companies as Environmental awareness, but they were not seen as equally important since they were prioritised lower, and therefore had higher values in Table 5. However, during the literature, review the external driving forces were more frequently mentioned compared to the internal driving forces. This correlates with Walker et al. (2008) study that indicated that more external drivers are mentioned in the literature compared to internal. This suggests that the literature believes that the external driving forces are more important for the transition toward green supply chains than what the companies in this study believe. One possible reason for this difference might be because this study only focuses on e-commence companies and the articles from the literature studied different actors within the supply chain. This study therefore indicates that the internal

driving forces are more important for e-commerce companies compared to other actors in the supply chain.

Company A was the only company that highlighted Governmental regulations as an important driving force although the literature review suggested it is one of the most important driving forces where 10 articles mentioned it as a driver. Björklund and Forslund (2013) stated that Governmental regulations is the most influential driver for logistics environmental development and Hickmann (2017) stated that companies comply with regulations in order to be prepared for future introduced regulations. It is believed that all of the interviewed companies do work and obey regulations affecting them, but maybe it was too obvious for them and not seen as a driving force. Additionally, Company C mentioned Governmental regulations as a possible barrier that can make companies satisfied by just doing what they must, and the respondent meant that it lacked the incentive to do more than what is required. Walker et al. (2008) also argue that Governmental regulations can obstruct innovation and could therefore act as a barrier.

When Company D was asked to prioritise the drivers, they said that they did not have any data regarding how much their customers acted as a driver for them. The respondent therefore said that it was hard to prioritise that driving force since it was not quantifiable. This reasoning might have affected the result from other companies as well. There might be easier for companies to prioritise driving forces that are quantifiable compared to drivers that are hard to measure. This might have led to that driving forces that are easier to measure getting a higher rank than the ones that are considered harder to quantify.

7. Answering research question 2

This chapter presents the answer to research question 2. The data collection for this question is presented and analysed in this chapter. All of the information is collected through the conducted interviews and the literature review. The transition towards green supply chains concerns minimising emissions from transportation in the downstream part of the supply chain. These transportations might be affected by activities that occur from different parts of the supply chain.

Q2: Which of the identified strategic areas have e-commerce companies experienced for the transition towards green supply chains?

7.1. The experienced strategic areas

To be able to answer research question 2, the result from the interviews regarding e-commerce companies´ strategies and activities for the transition towards green supply chains will be sorted after the two strategic areas Partners and Internal Management. At the end of this chapter, the two strategic areas will be analysed together.

7.1.1. Experienced activities within Partners

During the frame of reference activities regarding the strategic area Partners were identified. The identified activities are: Selection of partners, Cooperation with partners, and Distribution network. These activities were also mentioned by the companies in the conducted interviews.

Company A described that they have not actively worked on the development of green supply chains and that they have not included any activities to make their supply chain more sustainable. Company A also explained that they could choose LSP depending on how they include sustainability in their work, but the respondent mentioned that it is the customers that choose the shipping method which makes it hard for Company A to affect their decisions. The respondent mentioned that the company has chosen to work with several different LSPs but that it is hard for a smaller company, like Company A, to put pressure on LSPs to develop their sustainability work.

Company B highlighted, during their interview, the importance of choosing partners in order to reach their sustainability targets. The respondent explained that their strategy was to collaborate with one big LSP in each country they are active in. The LSP that Company B choose to collaborate with might have a longer transition period, but they have a greater impact in the end, according to Company B. Company B also talked about different collaborating projects they were involved in together with LSPs to reduce the emissions from the downstream distribution flow. Company B explained that they were willing to co-invest in new projects in order to reduce their total environmental impact. In addition, Company B described that they collect emission data from their transport partners and that they have a dialog together with them every six months. The respondent

explained that this enables them to follow up and monitor the emissions but also to set an action plan where both actors know what to do hereinafter in order to reduce the emissions.

When Company C was asked to describe activities that they worked with for the transition towards a green supply chain the respondent explained that they had a collaboration with a company to make all their transports electrical. Further, Company C explained that they work with LSP differently depending on the size of the LSP. For example, they are constantly working together with big LSPs to create more sustainable solutions together. They also described that they can put higher demands on smaller LSPs and that they choose to exclude smaller partners that cannot fulfil Company C's demands. The respondent also explained that Company C works closely with several LSPs to optimise the transport and to pressure them to develop more sustainable solutions.

Company D explained, during their interview, that they put pressure on their partners to become more sustainable. The respondent explained that they demand certain levels of sustainable actions from their LSPs and therefore make LSPs develop more sustainable solutions in order to collaborate with Company D. The respondent mentioned that they focus on making the transportation shorter, minimising the fuel used, and optimising the fill rate. Company D explained that they have a warehouse close to a big city which enables the transport to be shorter, faster, and fully electrified for that part of the country. They also highlight the importance of the distribution network in the transition towards a green supply chain.

During the interviews, Company E explained that their warehouse location was important for their transition towards green supply chains. Company E explained that they demand LSPs to have a high fill rate to be able to collaborate with their company. If LSPs cannot fulfil this demand, the LSPs will need to joint load with other actors and therefore create a higher fill rate together. The respondent from Company E also explained that they demand LSPs to have fossil free deliveries and that they command different data from LSPs, if the companies cannot live up to these demands will Company E not collaborate with these companies. The respondent explains that Company E is, due to its size, able to pressure LSPs to act more sustainable by including these demands.

The respondent from Company F said that their selection of partners today is based on what services the partner is offering and not primarily on their sustainability work but that their customers are free to choose which carrier they want to use. Company F has chosen to work with several LSPs since they reach different parts of the country, and it is important to Company F to be able to deliver to all their customers. Additionally, Company F's distribution network is not based on sustainability but rather on parameters such as last mile distance, lead time, and cost.

7.1.2. Experienced activities within Internal Management

The frame of reference also identified activities regarding the strategic area Internal Management. These identified activities are: Environmental management systems, Sustainable statements, and Information sharing. These activities were also mentioned by the companies in the conducted interviews.

During the interview, Company A mentioned their work with minimising the packaging for each delivered product when asked to describe their sustainable activities. They explained that this strategy, developed by their CEO, would minimise the size of the package but also the amount of

plastic used. Further, Company A mentioned that their CEO thinks sustainable activities and the 2030 Agenda for Sustainable Development are important. The respondent also said that the company will develop new strategies and goals to include the 2030 Agenda for Sustainable Development in their organisation. Lastly, Company A said that emission reporting could be interesting to include in order to be able to measure how well they would fulfil these goals or if the company chooses to be ISO certified.

Company B explained that they have internal sustainability goals for 2030. Additionally, the respondent talked about them setting clear target goals and how they communicate these. The respondent from Company B explained that they have different environmental certifications and that information sharing within the company was essential to lead the company onwards. Company B also worked with visualizing the environmental footprint of their products to their customers and they worked towards being able to showcase emissions per order according to the respondent. Lastly, Company B mentioned that they work with optimising the transportation by using smaller packages for their products which might lead to fewer transportations.

From the interview, Company C explained that they include emission reporting in their organisation and that they are constantly trying to reduce their emissions. The respondent from Company C also mentioned that they work with environmental certifications and communicate their sustainability work within the company.

Company D talked, during their interview, about package optimisation and that they think it is important to not deliver big packages filled with air. The respondent explained that this results in each truck can be filled with more packages which leads to less emissions per package. During the interview, the respondent also explained that emission data was used for decision making. Company D also explained that their head office is located at the same place as their storage which, according to the respondent, makes it easier for them to spread information within the company. In addition, the respondent from Company D said that environmental certifications are interesting and that certifications show the environmental impact to the customers but do not mean that they need to be sustainable.

During the interview with Company E the respondent explained that they had chosen to retain the cost for the transportation to the customers, in order to show the effect of the transportation on the environment. The respondent also talked about their work towards minimising packaging and that they were nudging their customers by putting fossil free transport alternatives at the top of the list at the checkout. The respondent from Company E further talked about difficulties concerning emission reporting and that they now work with the average distance a package is transported instead. This led to a better understanding for customers, of what alternative has less impact on the environment, according to Company E. For now, the goal for Company E is to have fossil free transportation but the respondent explained that they will not stop there and that they will develop their goals continuously.

Company F explained that they have hired an external consulting firm to help them develop sustainable strategies and to identify what they need to work with concerning sustainability. The purpose of the project is, according to Company F, also to develop internal goals together with the

consulting firm. After showing the identified activities, the respondent explained that they worked with Information sharing within the company. The respondent believed that environmental certifications were irrelevant for e-commerce companies within retail and that they therefore did not work with them. Lastly, the respondent explained that they gathered emission data from most of their partners depending on if they offered it or not. Company F further explained that a few LSPs charged money for issuing the emission report and that the level of details varied.

7.2. Analysis of the experienced actives within the strategic areas

In this part of the chapter, the presented information regarding the strategic areas will be summarised and analysed. The first part concerns the experienced activities from the interviews and in the second part, the strategic areas are classified and analysed.

7.2.1. The companies experienced activities

Firstly, the respondent from Company A chose Selection of partners and Cooperation with partners as the most important activities for their upcoming transition toward a green supply chain. Company B said it was hard to decide what activities that are most important since they work with all of the shown activities. The respondent from Company C explained that Selection of partners and Cooperation with partners are activities that the company worked with. The respondent also mentioned that they easily share information within the company because they are still a quite small company. The respondent from Company D talked about the importance of Distribution network and Selection of partners. Company E explained that Sustainable statements are the most important activity, followed by Distribution network, Selection of partners, and Cooperation with partners. The respondent from Company E also said that Information sharing is highly valued for them. The respondent from Company F explained that Sustainable statements and Information sharing were the most important activities for them. In Table 6 below, a summation of what activities all companies said were the most important ones in order to develop green supply chains in the downstream distribution flow is presented.

Table 6: Showcases the activities experienced by each interviewed company

	Partners			Internal Management		
	Selection of partners	Cooperation with partners	Distribution network	Environmental management system	Sustainable statements	Information sharing
Company A	X	X				
Company B	X	X	X	X	X	X
Company C	X	X				
Company D	X		X			
Company E	X	X	X		X	X
Company F					X	X

The result from the performed interviews shows that Selection of partners was the most experienced activity by the companies while only one company had experienced Environmental management system. Company B was the only company that had experienced Environmental management systems, including e.g. environmental certifications and they believed that this activity was important for the transition towards green supply chains. The respondent from Company F expressed that they believed that environmental certifications were irrelevant for B2C companies and that customers did not pay attention to them. Scholtens and Kleinsman (2011) disagree with this statement and argue that certifications, such as ISO 14001, might improve a company´s image and market share due to an increased relationship with the customers. Further, Company D highlighted the importance of the motivation behind the certification and that a company does not automatically become a more sustainable company when they obtain certifications. The motivation factor for including certifications within the company is something that also is highlighted by Scholtens and Kleinsmann (2011). They argue that many companies want to obtain certification to achieve a competitive advantage but that the certifications per se do not necessarily make them more sustainable which correlates with Company D's answer (Björklund and Forslund, 2013; Scholtens and Kleinsmann, 2011). The result from this study indicates that environmental certifications were not important for e-commerce companies´ transition towards green supply chains since only a few companies had worked with it and some even thought it was unnecessary for them. The literature however indicates that environmental certification in other industries might give companies a competitive advantage since it might affect customers´ selections. Environmental certifications as a part of Environmental management systems might therefore become more important even for e-commerce companies in the future if their customers then start to request them.

7.2.2. Identifying the strategic areas

During the identification of the strategic area, the authors agreed with Company C and Company D´s identifications that their main focus for their transition towards green supply chains is connected to the strategic area Partners, see Figure 7. The main reason for this is because it, based on the interview, seemed like both companies had the most experience in activities within this area. Company C had experienced the activities Selection of partners and Cooperation with partners. They highlighted, during their interview, their collaborations with a specific partner in order to transform their downstream supply chain to mostly electrical transportation. This was, according to Company C, one of the most important activities to make their supply chain more sustainable. This correlates with Wu and Dunn (1994) that explain that cooperation with partners and the used technology are important aspects to re-evaluate in order to improve a company's environmental performance. However, Company D, which was also connected to the strategic area Partners, mentioned that they had experienced Selection of partners and Distribution network for their transition. They explained that the most important activities for their sustainable work were the localization of their warehouse which enabled them to optimise their transport route and maximise the use of electric transport. In the frame of reference, the localization of a company's facilities was also highlighted and a local warehouse, as Company D has, is a strategic decision that will decrease the environmental impact (Aronsson and Huge-Brodin, 2006). Neither of these companies focused on the activities within the strategic area Internal Management during their

interviews. However, both of the companies indicated that they had experienced activities that could be connected to Internal Management, but they were not the main focus for them. Therefore, the companies were not classified in the strategic area Internal Management.

Company F explained during their interview that they had experienced Sustainable statements and Information sharing which resulted in their strategic area being identified as Internal Management. They explained that they have not yet included a lot of activities for the transition towards a green supply chain and that they are in the start-up phase regarding this. Their main focus was, for now, to identify the emissions and to set up internal goals to minimise them. One reason why Company F has not gotten so far with its development of more sustainable supply chains, compared to the other companies in this study, might be because Company F is the only company that only sells products that they have produced on their own. Because of this, their main focus might have been on how to make their products and production more sustainable and not on how to create more green supply chains downstream.

Company A said during their interview that the most important activities for their transition towards a green supply chain were Selection of partners and Cooperation with partners, but the authors did not agree with this statement. According to the authors, the activities that Company A had experienced were connected to the strategic area Internal Management. This was based on that the main focus during this interview was on the internal activities that lead to less emissions from the transport, and not on how the company chooses or collaborates with partners to minimise emissions. The authors did, therefore, classify Company A with the strategic area Internal Management instead of Partners.

Further, the authors found that Company B and Company E were working with activities within both strategic areas Partners and Internal Management, something the respondents also expressed in their interviews. This is because both of the companies explained how they had experienced activities in both of the strategic areas. Company B had experienced all of the identified activities in this study and Company E had experienced all except Environmental management systems. An interesting similarity between these two companies is that these two companies have the biggest revenues of all the interviewed companies. Perotti et al (2012) argue that the bigger the company the higher the implementation level of green activities which seems to be the case for these companies. Further, a large-sized organisation might have an advantage over smaller companies in most aspects when including activities for the transition towards green supply chains which might be a reason for these companies well developed activities (Perotti et al., 2012).

Table 7: Summarise which strategic area each interviewed company is connected to

	Strategic area
Company A	Internal Management
Company B	Partners and Internal Management
Company C	Partners
Company D	Partners
Company E	Partners and Internal Management
Company F	Internal Management

One interesting discovery regarding the strategic areas is that all companies in this study, except Company A, explained that they gathered emission data from their LSPs. One reason for the high interest in collecting emission data is in order to evaluate a company's climate performance. Values of carbon equivalent emissions from emission reports are becoming more requested by stakeholders, e.g. investors are becoming interested in carbon emissions as a risk signal for their investment (Córdova et al., 2018; Liesen et al., 2015). This study shows that all of the companies that were connected to the strategic area Partners gathered emission data. Therefore, this study suggests that there is a possible connection between the usage of emission data and the strategic area Partners. Working closely with partners can ease information sharing regarding emissions and therefore also enables the possibility to integrate emission reporting within the supply chain. This assumption correlates with Ramanathan et al. (2014) who state that close collaboration simplifies information sharing and that it is necessary for the development of green supply chains. This might also be the possible reason why Company A did not include emission reporting in their organisation. They had only experienced activities within the strategic area Internal Management and emission reporting is often something that partners provide the company with. Company A might therefore not have a close relationship with their partners, and it might therefore be harder for them to collect data regarding their emissions. However, something that contradicts this theory is that Company F mentioned that they do work with emission reporting even though they also only had experienced activities connected to the strategic area Internal Management.

Despite the high number of companies that gathered emission data, only a few companies could during the interviews explain how they integrated emission data into their organisation. Emission data could be used for data-driven decisions regarding how to improve the sustainability of logistic operations and at the same time reduce costs (Kumar et al., 2020). Herold et al. (2018) state that including emission reporting in the organisation could be used to set goals and measure a company's environmental performance. Despite the potential of emission data for the transition towards green supply chains, only one of the companies interviewed, Company B, described that they actively worked with their emission reports in order to develop green supply chains.

8. Answering research question 3

This chapter aims to analyse linkages between driving forces and strategic areas by using the analysis model. Firstly, the driving forces will be analysed together with the strategic area Partners, secondly, analysed with the strategic area Internal Management and lastly, both strategic areas will be analysed together with the driving forces to answer research question 3. The transition towards green supply chains concerns minimising emissions from transportations in the downstream part of the supply chain. These transportation might be affected by activities that can occur from different parts of the supply chain.a

Q3: How can the identified driving forces be linked to the identified strategies for the transition towards green supply chains?

8.1. Linkages between driving forces and Partners

Company B, Company C, Company E, and Company F were categorised to the strategic area Partners. Additionally, the three most important driving forces for the transition towards green supply chains for each of these four companies are summarised in Table 8 below.

Table 8: The most experienced driving forces for each company are divided into internal and external

Strategic area: Partners		
	Internal driving forces	**External driving forces**
Company B	Top management support, Environmental awareness	Competitiveness
Company C	Top management support, Environmental awareness	Customer demand
Company D	Environmental awareness	Competitiveness, Customer demand
Company E	Top management support, Environmental awareness	Customer demand

From Table 8, it can be seen that all four companies that worked with the strategic area Partners also mentioned Environmental awareness as one of the most important driving forces. This suggests that Environmental awareness is an important driving force for companies that works together with partners. If companies are aware of their environmental effects, they might also be interested in their partner's environmental effects. This can influence the selection of partners but might also ease collaboration regarding sustainability since they then have similar levels of ambitions and strive towards the same environmental goals. Jazairy (2020) states that alignment of green targets is encouraged for organisations to successfully realise green outcomes. It is conceivable that companies that involve partners in their development towards sustainability also

pressure their partners to care about environmental matters seriously, and to do so, environmental awareness amongst these partners is necessary.

It is also shown that all of the four companies, except Company D, prioritised Top management support which implies that Top management support also is an important driving force for this strategic area. Meager et al. (2020) argue that top management can decide whether to drive the work of green supply chains forwards due to their decision making power. It might be hard to decide to partner with a company without support from top management since it is them who in the end makes the final decisions and decides what their environmental actions will be and who to partner with. This can be the reason why almost all interviewed companies within the strategic area Partners expressed Top management support as an important driver for sustainable development.

It is also noticeable that none of the four companies that worked with Partners prioritised Governmental regulations as their top three most important driver. On the contrary, the literature stated that regulations are an important driver for sustainable development since companies do not have a choice to follow them or not (Meager et al., 2020; Micheli et al., 2020; Walker et al., 2008). Company D mentioned during the interview that they believed regulations concerned LSPs more than shippers and that they therefore did not prioritise it. This could be an explanation for why companies that work closely with partners still do not prioritise Governmental regulations since they are simply not directly affected by any, a reasoning Meager et al. (2020) also highlight. If this hypothesis is correct, it can be understandable why all of the four companies, that were connected to the strategic area Partners, did not prioritise Governmental regulations. The level of trust between the actors can therefore be important for the companies connected to this strategic area since it affects how successful the transition towards green supply chains is and how the risks are shared between the actors regarding governmental regulations (Micheli et al., 2020). Lack of trust in the supply chain is one major obstacle for green supply chains (Micheli et al., 2020; Walker et al., 2008). If a shipper only relies on that their partners will meet the governmental regulations, a high level of trust is important between the actors. A high level of trust between the actors in the supply chain is more likely to achieve better performance from the implementation of green supply chains (Micheli et al., 2020). The companies connected to Partners might not have mentioned Governmental regulations as a driver because they rely on that their partners meet the regulations since they have a high level of trust between the actors in the supply chain.

Table 8 also shows that no companies connected to Partners mentioned Cost reduction as a driving force for their development toward green supply chains. One possible reason for this is that it could be more expensive to work with environmental matters together with partners and Cost reduction could therefore not be seen as a driver for the interviewed companies. Working together with partners concerning sustainability could lead to higher costs, e.g. more time consuming or more expensive fuel. With this reasoning, Cost reduction would rather be seen as a barrier, something Walker et al. (2008) and Meager et al. (2020) also highlight. On the contrary, Meager et al. (2020) also mention that the implementation of green supply chains can cause cost reduction through e.g. improved efficiency. The development of green supply chains may, according to Ramanathan et al. (2014), lead to long term cost reduction and profitability in the future for all actors in the supply

chain, but the uncertainties regarding these benefits and the implementation costs might make cost a barrier for the transition towards green supply chains (Meager et al., 2020). This could be another reason why none of these companies mentioned Cost reduction as a driver. The majority of the interviewed companies had quite recently started to work towards a green supply chain together with their partners and since this development often leads to long term profitability might the companies not have experienced any cost reduction yet.

8.2. Linkages between driving forces and Internal Management

Company A, Company B, Company E, and Company F were classified in the strategic area Internal Management. All four companies prioritised different driving forces as most important to them, see Table 9.

Table 9: Summarises the highest prioritised driving forces for the companies that are connected to the strategic area Internal Management

Strategic area: Internal Management		
	Internal driving forces	**External driving forces**
Company A	Cost reduction, Top management support	Governmental regulations
Company B	Top management support, Environmental awareness	Competitiveness
Company E	Top management support, Environmental awareness	Customer demand
Company F	Top management support	Competitiveness, Customer demand

Table 9 shows that there is no clear connection between the companies' external driving forces within the strategic area Internal Management. However, all of the companies prioritised the internal driving force Top management support as important for them. This means that all of the interviewed companies that had experienced activities within the strategic area Internal Management also prioritised Top management support as one of the most important driving forces for the transition towards a green supply chain. The importance of Top management support has been identified earlier in other articles e.g. by Sandberg (2015) who states that it has the biggest impact on the opportunity to use logistics as a tool for strategic competitiveness and Jazairy and von Haartman (2020) describe top management as a key influencer for shaping organisations strategies towards green supply chains. However, the result from this study indicates that Top management support might be even more important for companies that focus on developing strategies regarding Internal Management. It might be more important to gain support from top management when a company wants to include activities that are connected to Internal Management. One reason for this might be due to top management's power over decision making

regarding a company's internal strategies and internal goals towards sustainability. Meager et al. (2020) state that a company's work towards green supply chains is based on their top management, since they hold decision making power, which therefore results in top management's high influence over the company's sustainability work. Additionally, Kumar et al. (2020) mean that it is necessary to consider both economic priorities and environmental goals for green supply chains and to do so, top management needs to identify requirements relating to sustainability. This shows that Top management support is important to succeed with internal activities concerning sustainability which can be a reason why all companies within the strategic area Internal Management prioritised Top management support as an important driving force.

Another discovery is that two of the companies connected to this strategic area prioritised Environmental awareness as important. This indicates that Environmental awareness also can be an important driving force when a company includes activities regarding Internal Management in their organisation. Activities regarding Environmental management systems, Sustainable statements, and Information sharing might therefore only occur if the companies are driven by Environmental awareness. It can be hard for companies to develop internal goals for more sustainable solutions if the company is not aware of their environmental impact (Meager et al., 2020), which might be a reason why numerous companies connected to Internal Management mentioned it as a driver.

Company A, which is connected to the strategic area Internal Management, was the only company that prioritised Governmental regulations as important. This indicates that Governmental regulations could be more important for companies connected to the strategic area Internal Management compared to companies connected to Partners. When a company only focuses on activities concerning Internal Management cannot the company trust that a partner will help them meet the governmental regulations, therefore, might this driving force be more important for companies within this strategic area. However, if this hypothesis is correct is it unexpected that only one company connected to Internal Management mentioned Governmental regulation as a driver. The reason for this might be that the other companies did not see Governmental regulations as a driving force and just something they had to obey, which will be further analysed in Section 8.3.

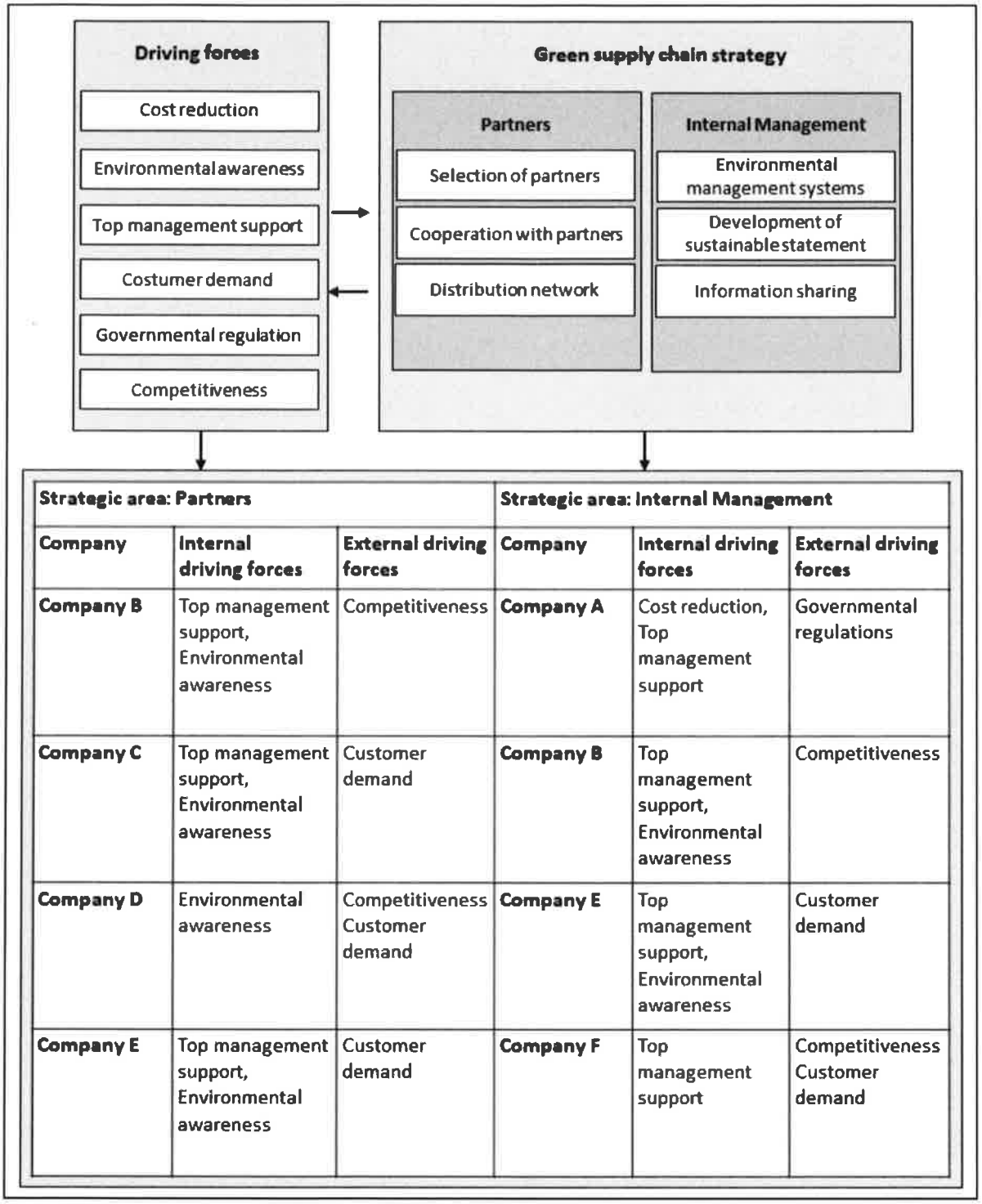
Only one company connected to Internal Management mentioned Cost reduction as a driving force for the transition towards green supply chains. One possible reason for this is that the activities connected to this strategic area might not lead to cost reductions. Cost can be seen as a possible barrier caused by investment in the training of employees and if a company e.g. wants to obtain an environmental certification it might even cost money (Meager et al., 2020; Micheli et al., 2020). In addition, internal goals connected to the transition towards green supply chains might lead to profitability in the long run but not initially which could be another reason why the companies did not mention Cost reduction as an important driver in order to set these types of goals. On the contrary, Oberhofer and Dieplinger (2013) state that profitability could be generated through the realization of opportunities for reduced costs and increased revenues which implies that internal goals toward green supply chains might reduce costs but Oberhofer and Dieplinger (2013) also state that it can be hard to measure these benefits. Therefore, companies connected to the strategic

area Internal Management could have gained profitability through their strategies toward green supply chains but since it is hard to quantify the benefits might it also be difficult for companies to identify Cost reduction as a driving force.

Another interesting aspect regarding Cost reduction and the strategic area Internal Management is that Company F pointed out the importance of that their sustainability work does not negatively affect the company´s profit. The respondent for Company F explained that it is more important that LSP can ship their products all over the country for a fair amount of money than that they could provide the company with a sustainable solution. In contrast to this, Company E, which also was connected to Internal Management, explained that it is okay if a more sustainable solution costs a bit more if it is necessary in order to achieve their goal to become more sustainable. The respondent from Company E highlighted that they think that it is okay if LSPs cannot deliver right outside of a customer`s door if it results in less emissions in the atmosphere. These two companies have the same strategic area for the transition towards a green supply chain but despite this, they have two different viewpoints on how to implement these activities. The different viewpoints of the two companies might result from their difference in size. Company E has bigger revenue, which might make them more tolerant of changes, in contrast to Company F, which has a smaller revenue and might therefore not be as resistant. Larger companies´ resistance might come from their ability to invest more resources into internal investments for sustainability, something that might be harder for smaller companies.

8.3. Linkages between driving forces and strategic areas

In sections 8.1 and 8.2, linkages between driving forces and each strategic area have been analysed separately. Therefore, this section will combine these two analyses and fulfil the analysis model, see Figure 11.



Strategic area: Partners			Strategic area: Internal Management		
Company	**Internal driving forces**	**External driving forces**	**Company**	**Internal driving forces**	**External driving forces**
Company B	Top management support, Environmental awareness	Competitiveness	**Company A**	Cost reduction, Top management support	Governmental regulations
Company C	Top management support, Environmental awareness	Customer demand	**Company B**	Top management support, Environmental awareness	Competitiveness
Company D	Environmental awareness	Competitiveness Customer demand	**Company E**	Top management support, Environmental awareness	Customer demand
Company E	Top management support, Environmental awareness	Customer demand	**Company F**	Top management support	Competitiveness Customer demand

Figure 11: The finalised analysis model.

Top management support was mentioned as an important driving force for all companies that were connected to the strategic area Internal Management and for all, except one, of the companies connected to Partners. This study therefore indicates that Top management support is an important driving force for e-commerce companies transition towards green supply chains regardless of the company´s strategy since they, according to Meager et al. (2020) hold decision power. Meager et al. (2020) also states that a company's culture and environmental work evolves from top management interests. This could be a reason why many of the companies interviewed worked with green supply chains since it might also evolve from their experienced top management support. Further, Hebaz and Oulfarsi (2021) also explain that top management support plays a significantly important role in the development of green supply chains in all of the company's strategic activities. Due to the importance of Top management support mentioned in the literature, it is no surprise that this driver was prioritized highly by five out of six companies.

Environmental awareness was also high prioritised by many of the interviewed companies and is therefore also seen as an important driving force in this study. Three of four companies that prioritised Environmental awareness high had a revenue higher than 1 billion in the year 2020 and had also experienced activities from both Partners and Internal Management. These three companies are the biggest companies that were interviewed for this study. Therefore, there might be a correlation between how important Environmental awareness is as a driver and the size of the company. To succeed with the transition toward green supply chains, environmental awareness is necessary according to Meager et al. (2020). This indicates that Environmental awareness can be a more important driving force for companies that have a large revenue compared to smaller companies. Since larger companies often have larger environmental impacts, they do also have a larger responsibility which requires them to be environmentally aware of their impact. Companies with larger revenues might also be able to put more resources into measuring their environmental impact, and those who do so probably get a greater environmental awareness. When a company is aware of its impact on the environment, it might be more willing to develop activities to minimise it. This correlates with Salhieh and Abushaikha (2016) who explain that activities that are driven by environmental awareness have a higher effect on the development of green supply chains. The result from this study indicates that if a company is driven by its Environmental awareness the company could develop activities within both the strategic area Partners and Internal Management. This suggests that Environmental awareness can be seen as an important driver no matter the company´s strategy.

Customer demand and Competitiveness were prioritised as nearly equally important driving forces for the interviewed companies within both strategic areas. These two driving forces can relate to each other since Customer demand for more sustainability can lead to competitiveness (Meager et al., 2020). Meager et al. (2020) state that if customers ask for more sustainable solutions it is likely to believe that customers also select shippers with the most environmentally friendly solution, which makes sustainability a competitive feature. This means that Customer demand and Competitiveness can be seen as quite similar driving forces. Customer demand and Competitiveness as driving forces for the transition towards green supply chains were well mentioned in the literature but not all of the companies interviewed prioritised them as important for green supply chains in this study (Herold and Lee, 2018; Oberhofer and Dieplinger, 2014;

Scholtens and Kleinsmann, 2011). Companies might need to meet customers' demand for more environmentally friendly services in order to stay competitive (Hebaz and Oulfarsi, 2021). However, during the conducted interviews some companies highlighted that it was the customers that made the final decision regarding how environmentally friendly their service will be and that it therefore was hard for e-commerce companies to affect their customers' behaviour. Company C mentioned during their interview that they believe that their customers prioritise fast and easy deliveries rather than environmentally friendly alternatives and that green supply chains therefore do not necessarily lead to increased competitiveness. This might indicate that not all of the e-commerce companies' customers demand more sustainable alternatives, which might be an explanation for why Customer demand and Competitiveness were not prioritised as the most important driving forces in this study despite them being well mentioned in the literature. The literature in this study did not solely focus on e-commerce companies which might be another reason for this difference.

The internal driving force Cost reduction was only mentioned by one company in this study, Company A, which was connected to the strategic area Internal Management. This might indicate that the driving force Cost reduction is more important for the strategic area Internal Management compared to Partners. As earlier mentioned, a strategy connected to Partners might not lead to cost reduction and instead lead to increased costs for the company which might be a reason why none of the companies connected to Partners prioritised this driving force high. If a green strategy within Partners results in Cost reduction, might it be in future profitability, which the interviewed companies might not have experienced yet and could be another reason for the low prioritisation. The result of this study indicates that it might be easier to reduce a company's cost by including green activities connected to the strategic area Internal Management. Cost reduction, as a driving force, might be more important for activities within Internal Management compared to Partners, especially for manufacturing companies. Despite this, Hebaz and Oulfarsi (2021) explain that cost related factors play an important role in the implementation of green supply chains since it could lead to cost reduction which follows the main goal for companies to generate higher profit to become more competitive. This argument contradicts the result from this study where only one company mentioned Cost reduction as an important driver for the transition towards green supply chains. One possible reason why only one company mentioned it as an important driving force in this study might be because some companies want to create an image that the motive for their green solutions is that they care about the environment and not only in order to save money. This might have resulted in the companies avoided to talk about Cost reduction during the conducted interviews in order to retain their green image.

Only Company A mentioned Governmental regulations as an important driving force for the transition towards green supply chains. Therefore, the result from this study indicates that Governmental regulations do not act as an important driving force for the interviewed e-commerce companies which disagrees with Walker et al. (2008) who states that it is an important driver for the transition toward green supply chains. A possible reason why the companies interviewed in this study did not prioritise Governmental regulations high might be because this study only focused on e-commerce companies and e.g. Walker et al. (2008) studied public and private sector organisations which include more actors within the supply chain rather than only shippers. As

Company D mentioned during the interview might Governmental regulations affect LSPs´ work more compared to e-commerce companies, which might be another possible explanation for why this driving force was not so highly prioritised by the companies for this study. In addition, the few governmental regulations that affect shippers might be regulations that the e-commerce companies simply must obey, and the companies might therefore not see these regulations as a driving force for their transition toward green supply chains. If the governmental regulations that concern shippers would have been stricter and put more pressure on e-commerce companies´ environmental work, is it possible that this driving force could have been prioritised as more important for the transition towards green supply chains for the interviewed e-commerce companies. This might indicate that the regulations regarding shippers are too weak in order to drive their work towards green supply chains, something that was not further investigated in this study.

Lastly, this study indicates that Top management and Environmental awareness are the most important driving forces for e-commerce companies´ transition towards green supply chains regardless of strategy. There might be a synergy between Environmental awareness and Top management support. High environmental awareness may be rooted in Top management support and if companies have high Environmental awareness might Top management support also be needed for the transition towards green supply chains. To gain a high environmental awareness as a company probably requires effort, time, and money, which makes support from top management necessary and pressure from internal stakeholders can also constitute environmental awareness according to Salhiei and Abushaikha (2016). These two driving forces may therefore go hand in hand, but this study has though not studied this possible correlation any further. Additionally, Top management supports high impact on companies´ sustainability work and Environmental awareness ability to create more effective green supply chains results in that these drivers are important for e-commerce companies transition towards green supply chains, regardless of strategic area. Further, Customer demand and Competitiveness were also highlighted as important drivers in this study but they might not be necessary for e-commerce companies´ transition towards green supply chains since they were frequently mentioned as important in the literature but not prioritised as the most important drivers during the interviews. These two driving forces were equally important for both of the strategic areas in this study. Lastly, Governmental regulation and Cost reduction appear to be the two least important driving forces for e-commerce companies´ transition towards green supply chains, since they got the lowest prioritisation and were least mentioned by the companies. Only one company prioritised these drivers highly and this company was connected to the strategic area Internal Management which could indicate that these drivers are more important for internal activities.

9. Conclusion

The increased amount of emissions come from an enhanced need for transportation that the rapid growth of e-commerce has led to. This has increased the interest in environmental sustainability and a growing need for green supply chains where emission reporting can be used. Emission reporting and green supply chains have traditionally only concerned LSPs but shippers´ demand for more sustainable services has increased over the years. Therefore, it was interesting to investigate what drives e-commerce companies´ transition towards green supply chains and how their strategies were affected. This study therefore aimed to answer the following purpose:

Identify driving forces for the transition towards green supply chains through e-commerce companies´ strategies.

The purpose was fulfilled by answering three research questions and completing the analysis model. The most experienced driving forces by e-commerce companies, for the transition towards green supply chains, were Top management support and Environmental awareness. These were the most experienced since they were prioritised highest by most of the companies interviewed and were also two of the most frequently mentioned drivers in the literature. Customer demand and Competitiveness were also well experienced, although not by as many e-commerce companies. However, these two driving forces were the most frequently mentioned drivers in the literature and therefore these drivers might also be important for the transition towards green supply chains. Lastly, Governmental regulations and Cost reduction were the two drivers that were the least experienced by e-commerce companies. Even though these driving forces were well mentioned in the literature only one company prioritised them as important, which indicates that they were the least important driving forces in this study.

Further, the strategic areas Partners and Internal Management were experienced by the same number of e-commerce companies, whereas two companies had experienced both strategic areas. The two companies that had experienced both strategic areas also had the largest revenues, therefore, this study indicates that it is easier for companies with high revenues to focus on different strategies at the same time. Additionally, most of the e-commerce companies interviewed gathered emission data, but the majority of them did not work actively with it and there was no specific strategic area where emission reporting was more included.

Lastly, this study shows that Top management support and Environmental awareness were the most experienced driving forces for e-commerce companies regardless of strategic area. Customer demand and Competitiveness were less important drivers for both strategic areas while Cost reduction and Governmental regulations were not experienced driving forces for e-commerce companies´ transition towards green supply chains. This indicates that supportive top management and high environmental awareness will ease e-commerce companies´ future transition towards green supply chains, regardless of their strategies. The result from this study can benefit e-commerce companies but also help other supply chain actors in their transition towards green supply chains.

10. Discussion

This chapter presents a discussion regarding the chosen driving forces and strategic areas and how the method was applied to fulfil the study's purpose. Furthermore, the generalisation and future research will also be discussed in this chapter.

10.1. Discussion regarding the result

The most important driving forces for this study were the same for both strategic areas. This indicates that companies´ strategic work does not affect the driving forces that drive companies´ sustainability work. One reason for this might be that driving forces affect higher levels of the organisation, while strategies might be decided on more operational levels. The influence of the driving forces might affect the higher hierarchical levels of the organisation. Further, this study focuses on logistic strategies and Björklund (2012) argues that logistical decisions often occur on lower hierarchical levels which might be a reason why these two identified strategies could be applied on a more operational level. Since driving forces and strategies could be on different hierarchical levels, it could be hard to find linkages between them.

One thing noted from the result was that the two companies with the most developed strategies toward green supply chains worked with different activities, even though they were connected to the same strategic areas. One of them worked closely together with one LSP with high market shares but a longer transition period, while the other company excluded this LSP and instead chose to collaborate with several smaller ones. Both companies have the same long term goal and want to minimise their environmental impact but realize it through different strategies. They both believe their strategy is the best one, but it is hard to know which strategy is most effective in the long run to reduce carbon emissions.

10.2. Discussion regarding the chosen driving forces and strategies

The study's result is partly based on the found drivers and activities for a transition towards a green supply chain in the literature. Therefore, if other drivers had been found, the result might have been different. Further, by conducting a larger literature review other drivers might have been recognized. The authors also believe that the most mentioned drivers might have been different if more articles had been read which would have affected the result. On the other hand, identified driving forces from the interviews harmonised with the literature review which suggests that the drivers found are highly relevant. Additionally, several of the respondents mentioned that they had experienced most of the identified driving forces from the literature, which indicated that these were relevant.

A larger literature review might also have resulted in identifying different activities for the development of green supply chains. The identified activities were mainly based on two different sources (Cetinkaya et al., 2011; Perotti et al., 2012), Perotti et al. (2011) dealt with activities regarding LSPs and green supply chain, and Cetinkaya et al. (2011) wrote about sustainable supply chains where activities did not have the main focus. Although activities for shippers were not the main focus of the two sources, the authors handpicked activities that could concern shippers and green supply chains. If someone else would have chosen the activities for shippers, other activities might have been picked. The authors believe that if more time would have been spent on the literature review regarding strategies for a green supply chain, more activities connected to shippers could have been found.

Further, if the scope had been broader and activities concerning LSPs´ work towards green supply chains would have been included in the study the result could have been different. A large part of the found activities in the literature concerned LSPs´ work, and their activities might even have a larger impact on the sustainability of the supply chain since LSPs executes the transportation. One company also mentioned, during the interview, that they did not have that much of an impact on their LSPs´ actions regarding sustainability due to its company's size. Therefore, it would have been interesting to also include LSPs in this study and investigate what activities would impact their transition towards a green supply chain. However, the focus of this study was on shippers and therefore, LSPs were excluded.

10.3. Discussion regarding how the method might have affected the study

During the interviews, the respondent viewed the identified driving forces and activities from the literature. By doing so, the interviewer was able to discuss the findings in the literature with the respondent. However, this might have affected the respondents´ answers. By showing the identified driving forces and activities from the literature might the respondent change their mindset and only focus on the aspects that the interviewer showed. To minimise this, all of the interviews started with a broad opening question where the respondents were able to talk freely about the two subject areas. This broad question was the main focus during the interviews and most of the time was spent on this question. Therefore, the result from the interviews was mainly collected through the questions that were raised before the driving forces and activities were shown which might have minimised the interviewer´s impact on the respondent answers.

The interviews for this study were conducted by the two authors and the authors were responsible for three interviews each. This led to the interviews might have been conducted in different ways. All of the interviews were semi-structured which led to the fact that the main questions were the same for all interviews, regardless of which of the authors were responsible for the interview, but the follow-up questions might have been different. The follow-up questions might have differed for each interview since two different people were conducting the interviews, but the follow-up questions might have differed even if the same person was conducting the interviews. The reason

for this is that the follow-up questions were mainly based on earlier answers from the respondent. Therefore, the result from this study would not have been completely different if the interviews were only conducted by one author.

All of the respondents from the companies had a background in logistics and most of them also had some experience in sustainability. Even if their titles were different, they all had similar knowledge within the studied area. However, one aspect that differed between the respondents was how long they had been employed at the company. Some of the respondents had been a part of the company for many years but others had recently become a part of the company. This was something that might have affected the result. The respondent that had worked in the company for a long time could clearly explain what the company had experienced, which was harder for the respondent that was new to the company.

Another aspect that one of the respondents highlighted during the interview was that they could be biased because they mainly had worked with the transportations within the company and therefore mainly focused on those aspects. This is something that the authors believe could apply to answers from all companies. Therefore, the driving forces and activities that the respondent found most important for their company, might not be the same that someone else at the company would have highlighted in an interview. To minimise this, additional interviews with more people within each company could have been conducted. However, the scope of this study was to investigate more than one company and to do so, it was only possible to have one interview with each company. Therefore, the respondent for each company was carefully chosen due to their expertise area so that they would be able to contribute with relevant knowledge to this study.

10.4. Generalisation and suggested research for future study

This study was conducted through six e-commerce companies with different revenues that were active within four different industries. Therefore, the result of this study could be applicable to supply chain actors within four different industries and the result is not only connected to one type of e-commerce company. Two of these industries contain more than one company which makes the result from this study generalisable within these two industries as well. Further, the identified driving forces and strategic areas can be seen as generic since they can be applied to other actors in the supply chain as well. The generalisation of this study could therefore be considered high. However, if more companies would have been included in the study, and if a higher number of interviews for each company would have been conducted, the study´s generalisation could have been even higher. Further, the generalisation could have been even higher if not only Swedish companies would have been studied. Swedish companies can have higher internal transparency due to low hierarchical levels, compared to companies operating in other parts of the world. Therefore, it can be hard to apply the result of this study to non-Swedish companies.

LSPs´ activities for green supply chains were early on excluded in this study but while performing this thesis the importance of LSPs´ activities was highlighted several times during the interviews

and in previous literature. Therefore, LSPs´ activities for the transition toward green supply chains would be interesting to study in future research. Additionally, the scope of this study was on the downstream part of the supply chain but during the interviews, one respondent mentioned problems for the upstream part of their supply chain as well. This indicates that it would be interesting to also investigate the upstream part of the supply chain for e-commerce companies´ transition toward green supply chains in future research. Lastly, which strategy that is the most effective in the future to reduce carbon emissions still needs to be further investigated.

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Appendix A – interview questions

This attachment presents the questions for the interviews with the e-commerce companies. These questions aimed to provide data to research questions 1 and 2.

Opening questions:

- Can you explain your position in the company and what you do?
- How does your company work with the transition towards a green supply chain?

Driving forces:

- What do you think drives your company to include sustainability in the supply chain?
- Do you work with emission reporting? If so, how?

The interviewer shows the respondent the six most frequently mentioned driving forces from the literature and explains each of the driving forces.

- Are there some of these driving forces that you believe drive your company to work with the development of green supply chains?
- Can you prioritise these driving forces after which ones you have experienced the most? Please motivate your prioritisation.

Strategies:

- How do you work with the transition towards green supply chains within your company?
- Have you included some activities for this transition?

The interviewer shows the respondent the activities identified in the literature review and explains each activity.

- Are there some of these activities that your company has worked with? If so, how?
- Do you think some of these activities are extra important for your company to develop green supply chains?

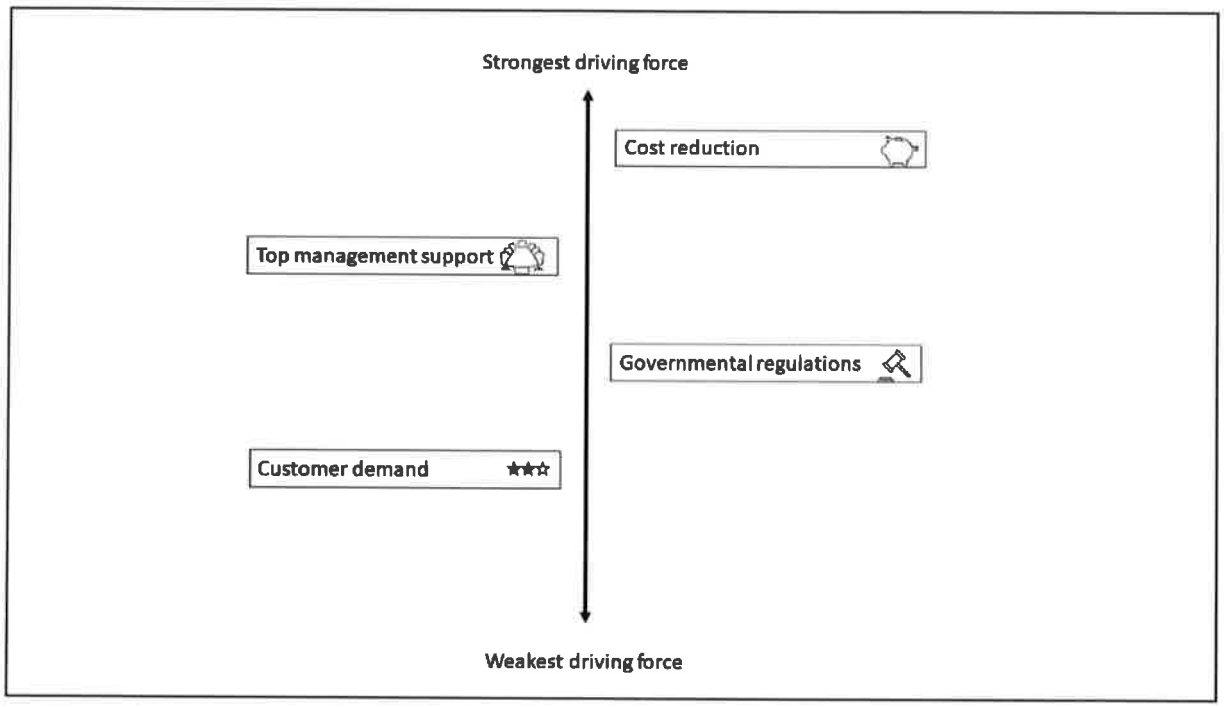
Additional questions (if we have the time):

- In which decision do you think emission reporting would be good to include?
- What is the potential of using emission reporting for your company´s strategic work?
- Do you think that the transition towards green supply chains is affected by the size of your company?

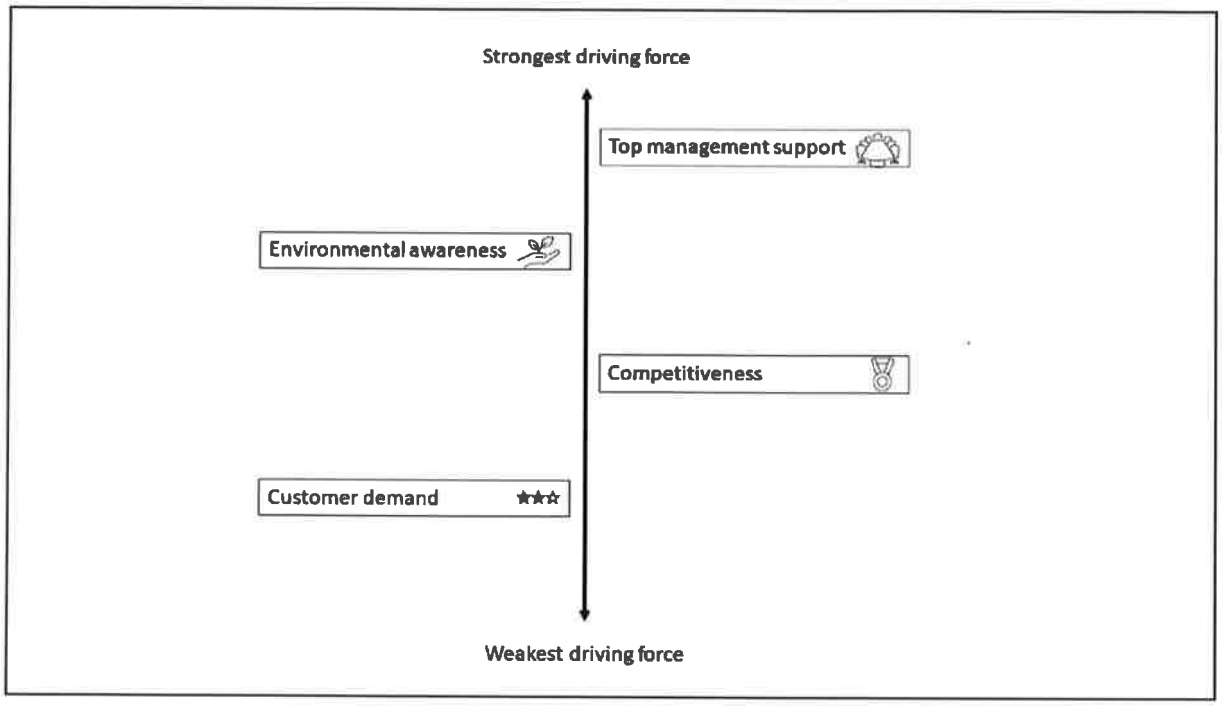
Appendix B – The prioritisation

This appendix shows the prioritisation of the identified driving forces by each of the interviewed companies.

Company A



Company B



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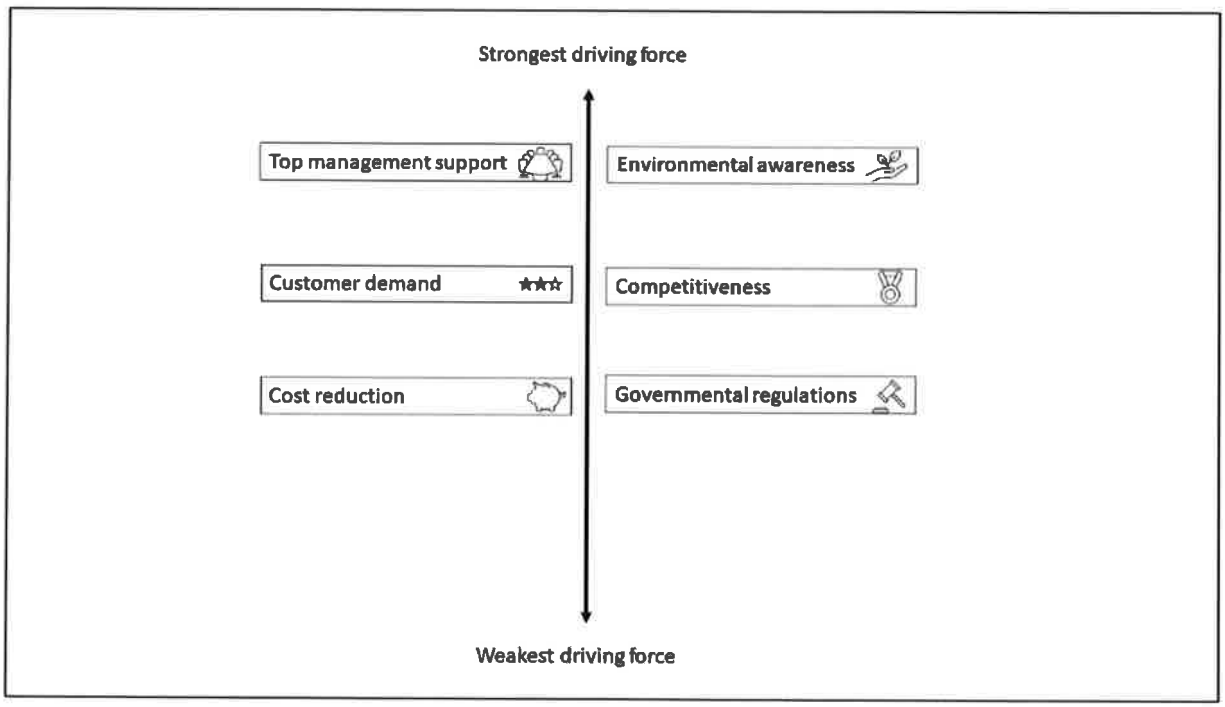
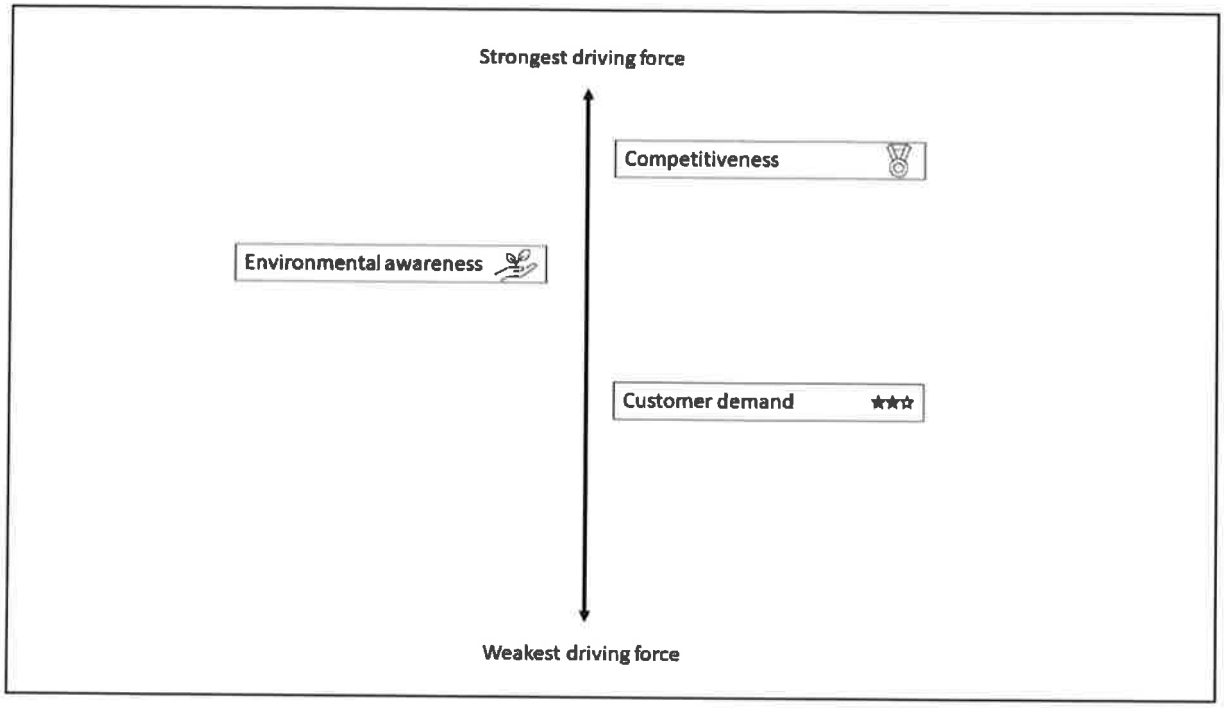
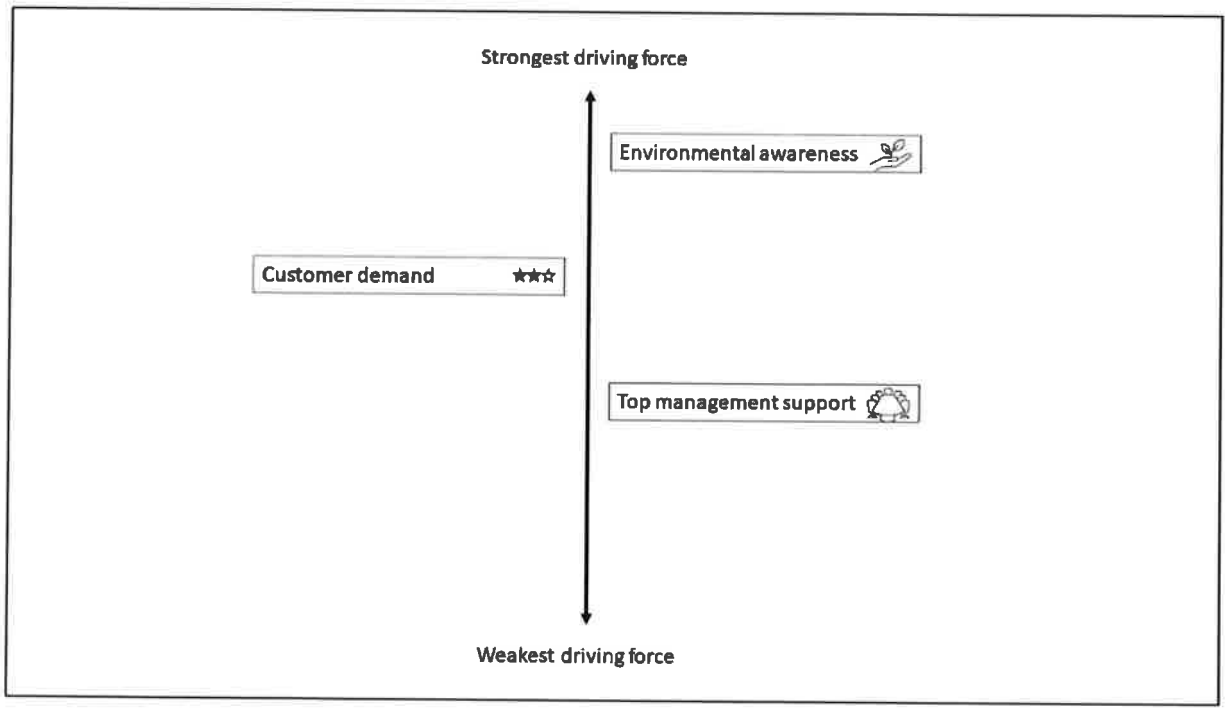


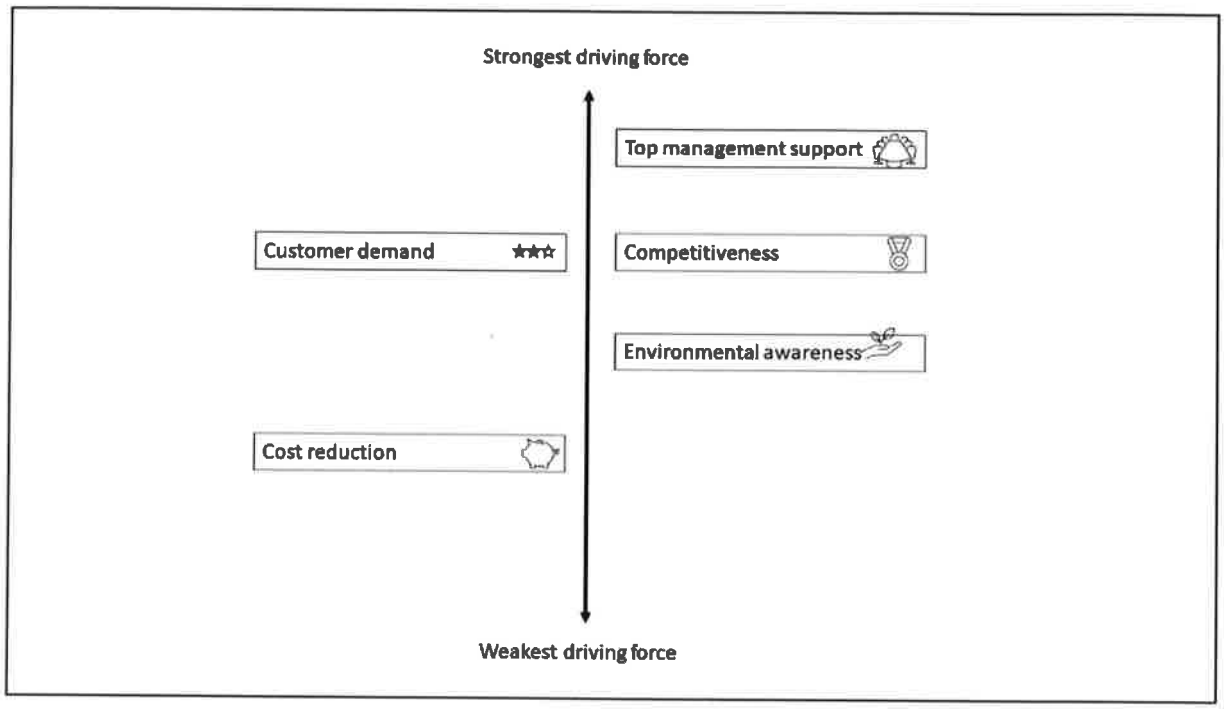
Company D



Company E



Company F


Strongest driving force
Top management support
Customer demand ★★☆
Competitiveness
Environmental awareness
Cost reduction
Weakest driving force