



# Master's degree thesis

**LOG950 Logistics**

**Understanding the preferences of Norwegian consumers for logistics services within online retailing of apparel products**

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## **Preface**

We would like to express our greatest appreciation to our thesis supervisor Tassew Dufera Tolcha. His assistance, valuable guidance and dedicated involvement helped us to accomplish our research. We are grateful for the collaboration with such an admirable person.

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Lusine and Victor

May 2021, Norway

## **Abstract**

The development of e-commerce, well-informed consumers and increase in their expectations created many challenges for online retailers. The last-mile delivery is one of the main activities of the online shopping process that plays a significant role in consumer decision-making. Moreover, it is the most demanding and cost-intensive part of the supply chain. Consequently, fulfilling the expectations of online consumers by understanding their preferences of logistics services is essential for creating satisfaction and increasing the logistics services efficiency of online retailers and their logistics service providers. Therefore, the objective of this study is to examine the preferences of Norwegian consumers for logistics services within the online retailing of apparel products. Full-profile conjoint analysis is conducted to meet the objective of the study. Nine profiles were created through the orthogonal design in SPSS version 23 with the use of four delivery attributes (delivery location, delivery speed, delivery cost and return cost) and their corresponding levels. The profiles are rated by 82 Norwegian consumers from three different cities. The results of the analysis indicate that free express delivery to the mailbox with free return cost is the most preferred choice of delivery service among survey respondents. Moreover, the most important attribute is delivery cost, followed by return cost, delivery location and delivery speed.

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# 1.0 Introduction

This chapter will start with the presentation of the thesis background and research motivation. It will continue with defining research objectives and identifying research questions. Moreover, within this chapter, the scope of this study will be described. The last part of this chapter will demonstrate the whole structure of the thesis making its content more comprehensible.

## 1.1 Background

Electronic commerce has evolved significantly during the last five years and it will continue its growth at a remarkable pace. It allows consumers to exchange goods and services electronically by eliminating time and distance obstacles. The competitive environment in which businesses operate has a significant impact on their strategy design. The strategy should emphasize the main objectives of the company and allow proper allocation of resources to maximize the company's strengths. As stated in Deloitte 2017 report, retailers are influenced by this continuous digital transformation either by their own initiatives or because of pressure from their competitors. The existence of information and communication technologies (ICT) and well-informed customers in recent years encourage firms to enforce technological capabilities into their strategies to achieve sustainable competitive advantages (Hua, et al. 2019). Nowadays many businesses started to conduct their operations also via the Internet. This will make the distinction between "traditional" and electronic" commerce a challenging task (Franco and Regi 2016). Compared with traditional business, E-commerce offers the consumers a wide range of advantages in terms of saving in time, great variety of products, low price, the convenience of shopping, etc., thus automatically changing the behaviour of the consumers (Siegfried and Zhang 2021). Since the development of e-commerce causes changes in the shopping habits of online customers, businesses which have online presence should adapt their strategies to meet the needs of online customers and be able to achieve success in the long run (Pereira, Salgueiro and Rita 2016).

One of the main activities of every process, especially in online shopping, is the delivery of products (Mentzer and Williams 2001; Van Hung, Ngo Tan and Gwangyong 2014). Wolfenbarger and Gilly (2003); Coşar, Panyi and Varga (2017) highlighted that the most important factor in fulfilling the expectations of online customers and creating satisfaction

is delivery service. Khan (2016) indicated that “*competitors are one click away from customers*” and the customers can compare prices and services offered by different e-commerce sites easily because of online market transparency. In case of feeling dissatisfaction for the services or products offered by the online sites, the customers can change the online retailers more instantly and effortlessly than in case of physical store (Khan 2016). Since with the single click customers can easily change online retailers, it is fundamental for e-retailers to provide delivery services in accordance with the requirements of their customers (Vasić, Vasić and Kaurin 2019). Research conducted by Coşar, Panyi and Varga (2017) proved that any problems connected to the delivery process may have an adverse impact on the online purchase experience of the consumers regardless of provided best user experience, such as high variety of products, good web design, etc. (Coşar, Panyi and Varga 2017). Therefore, it is essential for web shops to provide high quality and trustworthy delivery services to maintain their customers satisfied. On the one hand, high service-levels in last-mile delivery will create a positive experience for the customers and become a good opportunity for apparel e-retailers to expand their business. On the other hand, e-retailers will struggle to maintain high service levels and they need to constantly revise and improve their logistics activities to survive in a highly competitive market.

One of the main goals of many e-commerce platforms is to satisfy their consumer’s requirements by providing fast delivery because many people have a perception that the products which are purchased online are shipped immediately after placing an order. Moreover, fast delivery is important for online retailers to compete with their competitors through service levels (Siegfried and Zhang 2021). As claimed by Winkenbach and Janjevich (2018); Aryapadi, et al. (2020), the process of e-fulfilment, especially e-commerce deliveries, can be complicated compared to the traditional brick-and-mortar fulfilment. These complications are caused by less predictable demand for online shopping because people can place their orders 24/7, substantially lower order sizes and continuous increase in a variety of offered products (Aryapadi, et al. 2020). Therefore, e-retailers need to readjust their distribution patterns regularly with changing customer behaviors and service-level expectations and perform economically competitive operations at the same time.

Worldwide retail e-commerce has made 3.53 trillion US dollars in sales in 2019. It is projected that sales revenue of worldwide online retail business will reach 6.54 trillion US dollars in 2023 (Statista, Global retail e-commerce sales 2014-2023 2021). As reported by Statista (2020) revenue is expected to increase at an annual growth rate of 6.29%. The largest segment of the market is “Fashion” with 759,466 million US dollars projected market

volume in 2021. In 2021 the user penetration will amount to 50.8% and is forecasted to reach 63.1% by 2025. The average revenue per user is forecasted to measure up to 714.11 US dollars. Furthermore, worldwide e-commerce user number increased from 2.4 billion in 2017 and reached to 3.1 billion. This number will continue to grow, and it is predicted to reach approximately 5 billion in 2025. This means that almost 63.1% of the world population will turn into active e-commerce users (Statista, Worldwide eCommerce 2020).

According to DIBS' annual report (2018) on e-commerce for Nordic countries, Norwegian consumers realized many advantages of e-commerce and are enthusiastic about online shopping. The online expenditures in 2017 reached NOK 124.2 billion and are predicted to show a growing pattern. The growing tendency is explained by the fact that people from different age groups are involved in the process of online shopping compared to the past when e-commerce was popular for young generation (Tell, et al. 2018). Referring to Statistics Norway (2021a) data, 68% of Norwegian consumers within the age of 16-79 years old had online transactions in the last three months of 2020 (Statistics Norway 2021a) and 19% of them had one or two online purchases within the same period (Statistics Norway 2021c).

Although the apparel industry falls behind electronics in e-commerce penetration, the number of people purchasing clothes and shoes on the Internet has increased dramatically. For instance, during the 2014-2017 period online apparel purchases increased at a compound annual growth rate (CAGR) of 24 % in Southern Europe, 15% in Northern Europe and 14% in Central Europe (Aryapadi, et al. 2020). Norwegian online spending is distributed within three categories: travel, physical goods and services. Among physical products clothing, body and health care products, as well as physical media, are the most popular items that Norwegians spend their money on (Tell, Jarl, et al. 2018). Based on the Statistics Norway (2021b) data it is visible that in 2020 approximately 38% of Norwegian consumers within the age of 16-79 are particularly eager to buy clothing online (See Figure 1.1). As stated also by DIBS' annual report (2018) clothes, shoes and accessories are the major subcategories of physical goods purchased online by Norwegian consumers (Tell, et al. 2018).

As reported by Jacobs, et al. (2019), the last-mile delivery services costs represent 41% of total supply chain costs. According to Wang, et al. (2016), the last mile is the most cost-intensive part of the supply chain reaching up to 28% of the overall delivery costs and continues to require new resources to an even higher level. The reason behind this inefficiency is the market expansion. New e-retailers enter the market together with existing

retailers that change their business model into omni-channel retail and generate a new stream of delivery and return of purchased products (Saghiri and Wilding 2016).

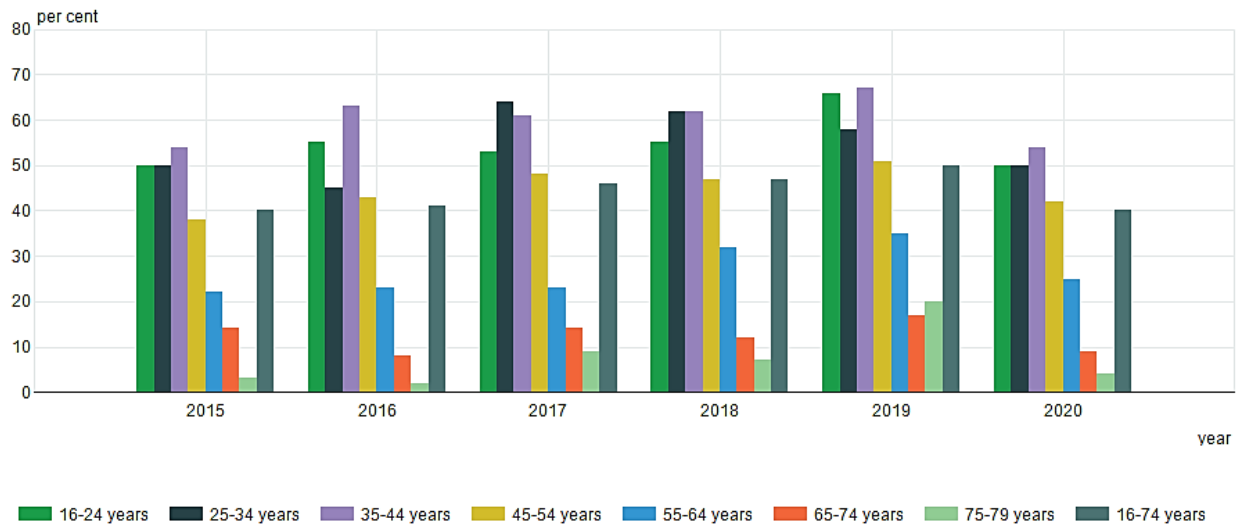


Figure 1.1. Use of the Internet for buying or ordering clothes/sports goods (%)  
(Source: Statistics Norway 2021b)

In our research, we chose online apparel retail as the topic of our investigation for several reasons. First, fashion products are among the most frequently purchased products in Norwegian e-commerce (Statistics Norway 2021b; Tell 2018). Secondly, apparel e-commerce has steadily grown over the last decade (Statista, Worldwide eCommerce 2020). Lastly, the apparel industry is characterized by unpredictable demand and has volatile nature (Fernie and Sparks 2009; Christopher, Lawson, and Peck 2004). Therefore, quick response to changes in the consumer demand caused by the market variations or changed consumer preferences at all times and including during the Covid-19 pandemic requires precise knowledge about the needs of the consumers.

The last-mile delivery of the products is an important task in e-commerce and the most cost-intensive part in the SC (Jacobs, et al. 2019; Wang et al. 2016). It is necessary to understand the consumers' preferences of logistics services within online apparel retailing to be able to quickly respond to the market variations because new market conditions require more frequent and detailed planning of SC. Furthermore, improved delivery service will allow retailers to differentiate themselves from the competitors and make consumers satisfied. Satisfied consumers are more likely to make a repeated purchase which will lead to increased sales (Aryapadi, et al. 2020).

## 1.2. Research Objectives and Questions

The main reason for the apparel industry to use the Internet was improving the effectiveness of their operations and marketing activities, help customers to get information about products and their availability, creating a brand image and offering the customers a valuable medium to make their shopping online (Tuunainen and Rossi 2002). Some authors claim that logistics play a significant role in the growth of e-commerce as a cost driver and as a service level promoter (Ghezzi, Mangiaracina and Perego 2012). In the scientific literature, many authors evaluated the efficiency of fulfilment strategy and its impact on firm performance in an e-commerce market (Ricker and Kalakota 1999, Cho, Ozment and Sink 2008), investigated e-commerce logistics strategies and logistics problems (Ghezzi, Mangiaracina and Perego 2012), evaluated the environmental impact of shipping activities (Ben-Hakoun, Shechter and Hayuth 2016; Choi, Chung and Young 2019), explored the factors affecting customer satisfaction in online shopping (Lin, Wu and Chang 2011; Rudansky-Kloppers 2014) and the impact of logistics services on e-purchasers' satisfaction (Querin and Göbl 2017; Rajendran, et al. 2018; Lang 2020). It is visible that much research has been conducted on the field of e-commerce and its logistics strategies in different countries from company and consumer perspectives. However, limited number of studies exist which examine online shopping in Norway, and even less that analyze consumer preferences for logistics services in online retailing. Some research refers to online retailing of electronics and grocery products (Zhang and Li 2018; S. Rao, et al. 2011; Wilson-Jeanselme and Reynolds 2006) but limited amount of research exists about apparel retailing. Therefore, this research will concentrate on online retailing in apparel industry and will try to understand the preferences of Norwegian e-shoppers for logistics services. The findings of this research will serve as a guidance to online retailers and logistics service providers (LSP) to improve the efficiency of their logistics activities and achieve customer satisfaction by increasing service levels and meeting consumer requirements. Given the scarce of previous research on consumer opinions of delivery attributes in online retailing, and more specifically in the field of online apparel retailing, the main objective of this thesis is:

- ❖ Analyze the preferences of Norwegian consumers for logistics services within online apparel retailing.

To proceed our research and explore consumer preferences for logistics services when they shop apparel online, it is necessary to identify the logistics attributes offered by online

retailers that the consumers perceive important and have an influence on their purchasing decision. Therefore, we can formulate our first research question as follows:

- What are the logistics attributes that determine consumers' decision to make online purchase?

The results of the first question will help us to define the attributes and their levels that are necessary to conduct a conjoint analysis to examine consumer preferences. Therefore, we can define our second question as:

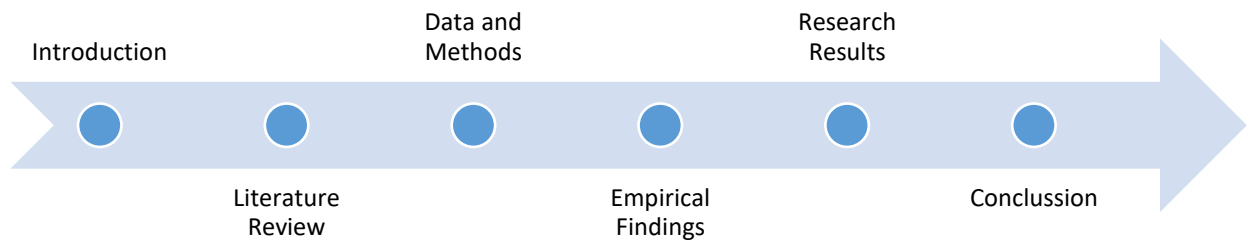
- What are the consumer preferences for logistics services when they shop apparel products online?

### **1.3. The scope of the study**

This research analyses consumer preferences for online shopping in Norway and the obtained results may differ significantly for the rest of the world because of cultural and demographic features. Moreover, this research considers apparel products as clothing and shoes for men, women, and children as well as accessories, such as hat, scarves and gloves and bags. Dedicated outdoor and sports clothing as well as baby clothes are not included as a category of apparel products within this research because our examined websites of five most popular online stores in the fashion segment in Norway based on their annual e-commerce sales in 2018 provided by Statista (2021e) does not include the above-mentioned products as a category of apparel products.

### **1.4. Thesis Structure**

This thesis consists of seven different parts including the introduction, literature review, data collection and analysis methods, empirical findings, research results, discussions, and conclusion (See Figure 1.2). This thesis starts with the introduction part (Chapter 1) which provides the background for the topic, indicates the gaps existing in the field and states the objective of the research and why it is worthwhile for studying. The next chapter of the thesis is the literature review (Chapter 2) which provides an overview of existing knowledge, gives information about the research area, and helps to identify relevant theories to address the research question.



*Figure 1.2. Thesis Structure*

Chapter 3 presents the methodology where we explain our research type, describe the methods of gathering and analyzing data and provide the reasons for choosing an analysis method. Empirical findings section (Chapter 4) illustrates pilot study and questionnaire survey. Research Results chapter (Chapter 5) demonstrates statistical results and analysis. The research summary, managerial implications, study limitations and suggestions for further research are included in the last chapter of this thesis (Chapter 6).



## **2.0 Literature Review**

This chapter will demonstrate the connection of our research questions to the previous studies and theoretical frameworks. In the first part of this chapter, we will introduce the concept of e-commerce, its impact on the retail industry, compare online and offline retailing, outline the influence of online retailing on consumers and firms, and describe the Norwegian e-commerce market. In the second part of this chapter, we will define the supply chain (SC), its structure and strategies specific to the apparel industry and describe the “last-mile problem” in a distribution process. In the third section of this chapter, we will examine the consumer’s role and describe their experiences during last-mile delivery. The fourth part of this chapter will contain the overview of attributes that will be used to conduct conjoint analysis. Moreover, in the last part of this chapter, we will analyze, and list logistics services offered by popular online stores in the fashion segment in Norway.

### **2.1 The Emergence of E-Commerce**

The rapid development of technology and its use in a business environment created a range of new terminology such as e-commerce which is a shorthand for electronic commerce (Burt and Sparks 2003) and has been accompanied by more special terms namely e-business, e-marketing, e-tail, etc. (Chaffey 2009). Simply defined, commerce refers to the buying and selling of goods for money, and e-commerce is commerce facilitated by the Internet (Kütz 2016; Chaffey 2009; Whiteley 2000). Broadly it can be also defined as “all electronically mediated information exchanges between an organization and its external stakeholders” (Chaffey 2009, p. 10). In the opinion of Burt and Sparks (2003), e-commerce refers to process innovation which is achieved using technologies and the Internet that enables reconfiguration of existing business by improving the collection and use of real-time data, replacing the inventory with information, and introducing new operations by changing traditional tasks and roles within the distribution channel. As stated by Goswami (2013) and Chaffey (2009), the scope of e-commerce is broad and not restricted by the trade of goods and services. It also involves pre-sale and post-sale activities within the supply chain by the Internet. According to Goswami (2013), e-commerce scope consists of the following business process elements: information exchange, order placement, payment and delivery, customer service and marketing. In the mid-to-late 1990s, the Internet created many opportunities, and many “dot-coms” have launched. To sustain growth many traditional “brick and mortar” enterprises that had limited Internet presence continued to adopt technological advancements and turned into “click and mortar” companies that combine an

online and offline presence (Turban et al. 2015; Chaffey 2009; Burt and Sparks 2003; Katros 2000). Virtual merchants that only had an online presence were called “Internet pureplay” or “click only” companies (Turban et al. 2015; Chaffey 2009). Click-and-mortar is the most popular e-retailing model which competes with click-only models (Turban et al. 2015). Nowadays, e-commerce is usually described as transactions among an organization and its stakeholders (Chaffey 2009). Since 2000, the exponential growth of e-commerce activities has been noticeable in the developed world (Ghamdi, Alfarraj, and Bahaddad 2014). In the opinion of Katros (2000, p. 75) ‘‘Retailers have worked through the stages of shock, denial, anger, grief and acceptance in coping with the Internet, and are now rushing to identify and secure ways to protect their customer relationship franchise’’.

### **2.1.1 E-Commerce Types**

According to Kütz (2016), E-Commerce is directed by different categories of actors. The first category represents persons and is abbreviated as “C”. It includes potential consumers and citizens based on the specific context. The second category stands for business organizations and is abbreviated as “B”. The second category includes producers and suppliers, financial service providers, trade agencies, logistics and transportation companies, and different intermediaries. The third category represents governmental authorities and is abbreviated as “G”. This category may include local, national, and international authorities. Based on the specific features of the transaction and involved parties, the “X2Y business” model arises, where X and Y are associated with the above-mentioned categories (Kütz 2016).

Within the literature, e-commerce is classified into different models. For instance, Fernie, Fernie and Mckinnon (2014); Davis and Benamati (2003) classified e-commerce into business-to-consumer (B2C), business-to-business (B2B), consumer-to-consumer (C2C) and business-to-employee (B2E). Goswami (2013) distinguished B2B, B2C, C2C, peer-to-peer (P2P), Mobile commerce (M-Commerce), business-to-government (B2G), consumer-to-business (C2B), government-to-government (G2G), government-to-business (G2B), and government-to-consumer (G2C) e-commerce models. (Kütz 2016) mentioned C2C, B2C, B2B, G2C, G2B, G2G e-commerce types based on the relationships of different actors. Chaffey (2009) gave the summary and examples of different e-commerce transaction alternatives according to involved actors (See Figure 2.1).

Based on whether the transactions are mainly with consumers or other businesses, two types of e-commerce “models” became popular: B2C (business-to-consumer) and B2B (business-to-business) (Chaffey 2009). In our research, we will consider the B2C type of transactions which is the most discussed and well-known type of e-commerce among consumers. Kütz (2016); Laudon and Traver (2010) categorize B2C into seven models: online retailer, portal, transaction broker, content provider, market creator, community provider and service provider. Burt and Sparks (2003) claim that B2C business is often termed as e-retailing, and e-commerce and e-retailing are inseparable because even though technology enables process innovation, the essence of the retail process for most products remains unchanged. In this study, we will consider online retailing to narrow the scope of our research.

		From: Supplier of content/service		
		Consumer or citizen	Business (organization)	Government
To: Consumer of content/service Business (organization) Government	Consumer or citizen	<b>Consumer-to-Consumer (C2C)</b> <ul style="list-style-type: none"> <li>• eBay</li> <li>• Peer-to-Peer (Skype)</li> <li>• Blogs and communities</li> <li>• Product recommendations</li> <li>• Social networks: MySpace, Bebo</li> </ul>	<b>Business-to-Consumer (B2C)</b> <ul style="list-style-type: none"> <li>• Transactional: Amazon</li> <li>• Relationship-building: BP</li> <li>• Brand-building: Unilever</li> <li>• Media owner – News Corp</li> <li>• Comparison intermediary: Kelkoo, Pricerunner</li> </ul>	<b>Government-to-Consumer (G2C)</b> <ul style="list-style-type: none"> <li>• National government transactional: Tax – inland revenue</li> <li>• National government information</li> <li>• Local government services</li> </ul>
	Business (organization)	<b>Consumer-to-Business (C2B)</b> <ul style="list-style-type: none"> <li>• Priceline</li> <li>• Consumer-feedback, communities or campaigns</li> </ul>	<b>Business-to-Business (B2B)</b> <ul style="list-style-type: none"> <li>• Transactional: Eurooffice</li> <li>• Relationship-building: BP</li> <li>• Media Owned: Emap business publications</li> <li>• B2B marketplaces: EC21</li> </ul>	<b>Government-to-Business (G2B)</b> <ul style="list-style-type: none"> <li>• Government services and transactions: tax</li> <li>• Legal regulations</li> </ul>
	Government	<b>Consumer-to-Government (C2G)</b> <ul style="list-style-type: none"> <li>• Feedback to government through pressure group or individual sites</li> </ul>	<b>Business-to-Government (B2G)</b> <ul style="list-style-type: none"> <li>• Feedback to government businesses and non-governmental organizations</li> </ul>	<b>Government-to-Government (G2G)</b> <ul style="list-style-type: none"> <li>• Inter-government services</li> <li>• Exchange of information</li> </ul>

Figure 2.1: Summary and examples of transaction alternatives among businesses, consumers and governmental organizations (Source: Chaffey 2009, p.26)

### 2.1.2 Comparison of Online and Offline Retailing

According to Turban et al. (2015), a retailer is defined as a sales intermediary between the producers and customers. To increase the efficiency of product distribution, the companies that produce a wide variety and many products for customers must rely on retailers. However, the companies with a comparatively low variety of products may also require retailers to sell the products to a large number of consumers in different locations. As stated by Laudon and Traver (2010), online retailing is "an online version of traditional retail"

which includes “click only”, “brick and click” e-retailers, producers selling directly via the web and catalog merchants.

Schobesberger (2007) compares online and offline retailing channels taking into consideration several channel attributes such as entertainment, social interaction, safety, points of contact, product range selection, information possibilities and fulfillment (See Figure 2.2).

Online retailing is different from traditional commerce with new requirements for operators. In distance trade, online retailing represents one of the most influential retail formats. Store location, employees and store inventory processes lose their meaning in online selling. Companies must change their attitudes towards retail branding, brand profiles and advertising, and need to revise new Internet-oriented branding strategies. A customer-oriented business approach is an essential condition for profitable online selling. Online retail business processes should be organized as "a bundle of core processes", to manage the processes from the supplier to customer without interruptions and generate a customer-oriented handling process. However, online retailers should also improve speed, transparency and service orientation by implementing closed inventory management systems, efficient and lean business methods. These will enable them to meet the current challenges of changing market environment (Heinemann and Schwarzl 2010).

Dimensions	Store	Internet shop
Entertainment	Medium to high	Medium to high
Social interaction	High	Very low
Personal security	High	Marginal to medium
Data security	Medium to high	Low to medium
Points of contact/order charging options	Low	Many
Delivery time	Immediate	Within days
Product range selection	Very low to high	Middle to high
Information offers - Quantity - Quality	Medium High	High High
Time spent on purchase	High	Very low
Delivery costs	Very low	High

Figure 2.2: Online and Offline retailing comparison (Schobesberger 2007, p.23)

Customers receive information from both channels in different ways. Direct contact with sales personnel as well as feeling and trying the products in stores is a completely different

experience compared to the online stores where customers receive information via phone or e-mail and get a visual presentation with a written description of the products. On the one hand, searching store locations can be time-consuming for offline stores. On the other hand, time wasted during the delivery process from the online store to the customers. Every level of purchasing process can be impacted by diverse costs (travel, delivery, packaging, opportunity costs, etc.) that are not associated with product price (Heinemann and Schwarzl 2010).

### **2.1.3 The Impact of Online Retailing on Consumers and Firms**

According to Kütz (2016); Goswami (2013), e-commerce has some advantages and disadvantages for customers and online product or service providers. Among the advantages of E-commerce for customers, the authors mention flexible shopping hours and location as well as the availability of global offers that means more affordable prices because of increased competition among the providers. Moreover, people can shop from the comfort of home and receive purchased products at their doorstep (Goswami 2013). Chopra and Meindl (2016) analyzed the impact of online sales on customer service elements, such as response time to customers, variety of products, product availability, customer experience, time to market, order visibility and returnability. The authors also stated that customer experience is affected by online sales in terms of access, customization, and convenience. Although online sales make it possible for firms to access geographically distant customers, it is limited by the Internet access of the customers. The Internet increases the ease of doing business for both consumers and firms. Consumers make an online purchase without leaving their homes or workplace and firms create a personalized buying experience for customers to offer them the products that suit their needs. However, online selling increases the response time to customers compared to a retail store (Chopra and Meindl 2016).

E-commerce enables consumers to easily find and purchase substitutes for the company's products. In this case, the power of online product or service providers declines, and the price of the products or services is also reduced. As a result, the online shops that manage to offer unique products or services can increase the market share (Kütz 2016). Chopra and Meindl (2016) conclude that online sales make it possible for firms to offer a larger variety of products and improve product availability by aggregating inventories. In addition, being more informed about consumer preferences allows online selling businesses to improve product availability. This is fundamental for low-volume and high variety goods. Via online

channels, a firm may introduce a new product to a market faster compared to physical channels. In the report of Steel et al. (2013), lower product prices and increased product variety, as well as reduced locational importance, are also recognized as the biggest drivers of e-commerce. In addition, they reported that increased product variety and reduced search costs have led to changes in consumer demand and an increase in consumer welfare (Steel et al. 2013). As stated by Chopra and Meindl (2016), online sales increase product order visibility but product returnability becomes harder compared to the retail store. In the opinion of Goswami (2013), a time-consuming returning process, privacy and security issues, delivery of tangible products at extra cost, the impossibility of proper product inspection and feeling, absence of social interaction represent some drawbacks of online selling.

The ability of e-commerce to facilitate outsourcing and reduce capital requirements for entry causes changes in market structure making it more competitive. In addition, another negative impact of e-commerce on online enterprises is an increase in logistics costs because the products must be sent to the consumer's location (Kütz 2016). Chopra and Meindl (2016) also claim that for non-digital products an online seller tends to have higher outbound transportation costs. Despite the challenges, e-commerce generated many positive opportunities for businesses. E-commerce tools have been introduced by many businesses worldwide to gain a competitive advantage (Ghamdi, Alfarraj, and Bahaddad 2014). It enabled businesses to reduce the costs related to purchasing, supplier relationship management, logistics and inventory, enhanced communication in the overall supply chain, improved service offerings, consequently provided opportunities for competitive differentiation (Chopra and Meindl 2016; Turban et al. 2015; Zhenxiang and Lijie 2011; Burt and Sparks 2003). As stated by Steel et al. (2013); Burt and Sparks (2003), reduced searching costs and the importance of location make it possible for firms to easily connect to customers and eliminate geographic restriction. Amed et al. (2020) claim that in order to address growing demand in the highly competitive apparel industry, the companies are under pressure to be the first movers in e-commerce to gain benefits of advanced technologies and improve variety across their product assortment.

#### **2.1.4 The E-commerce Market in Norway**

The Norwegian e-commerce market is the world's 23rd largest market for e-commerce with a US\$6 billion revenue in 2020. Showing an increase of 18%, the contribution of the

Norwegian e-commerce market to the worldwide growth rate amounted 26% in 2020. With the emergence of new markets and the potential for the development of existing markets, the revenues for e-commerce will continue to grow ("ecommerceDB" 2021).

The largest online store in the Norwegian e-commerce market is [elkjop.no](http://elkjop.no) with a US\$323 million revenue in 2020. It is followed by [komplett.no](http://komplett.no) and [zalando.no](http://zalando.no) with a revenue of US\$253 million and US\$161 million, respectively. These top 3 online shops together generate 10% of online revenue in Norway ("ecommerceDB" 2021).

According to Statista (2021 d), the revenue in the Norwegian e-commerce market is forecasted to reach US \$6,850 million in 2021. Moreover, it is expected that within 2021-2015 revenue will show a 3.24 % annual growth rate. As a result, a forecasted market volume will reach US \$7,782 million by 2015. The largest segment in the Norwegian e-commerce market is Fashion with a forecasted market volume of US \$1,969m in 2021. It is predicted that user penetration will be 85.2% in 2021 and will increase to 86.2% by 2025 and the average revenue per user (ARPU) is predicted to become US\$1,471.19(Statista 2021 d).

As reported by "ecommerceDB" (2021), the largest e-commerce segment in Norway is "Fashion" accounting for 29% of the e-commerce revenue. It is followed by "Electronics & Media", "Toys, Hobby & DIY" segments with 23% and 20% revenue contribution, respectively. The remaining 17% and 12% of revenue are generated by "Toys, Hobby & DIY" and "Food & Personal Care" segments accordingly. However, as indicated by DIBS (2019) report, in 2018, travel was the most popular e-commerce category among Norwegians followed by physical goods and services categories with a spend of NOK 49 Billion and NOK 30 billion, respectively. Furthermore, the report shows that electronic services (digital media, tickets, insurance, parking, telecom, etc.) have become a major hit among Norwegian consumers especially for the age group of 25-34 years. Within the physical goods category, clothes, shoes and accessories are the products that the Norwegian consumers (58%) prefer the most to spend their money on. Other physical goods, such as physical media (books and films), electronics, body and health care products are bought accordingly by 33%, 30% and 40% of Norwegian consumers. Although female consumers in Norway purchase more frequently compared to male consumers, the average spending per month for males is 3349 NOK and for females 2960 NOK. Females tend to exchange physical goods bought online in a physical store. Furthermore, on average young consumers spend 1825 NOK per month, whereas older buyers spend 2475 NOK per month (Tell, et al. 2018).



According to Audience Project Study (2016), 90% of Norwegians shop online and the majority of them make up to six purchases per month. This report also states that clothes and shoes are the most preferred online purchase category by Norwegians. In 2016, 16,7% of Norwegians claimed that they purchased shoes and clothes online, whereas in 2011 only 10% of online purchases represented clothes and shoes (Werliin and Kokholm 2016).

The favorite delivery service providers among online retailers in Norway are PostNord followed by Posten and Bring ("ecommerceDB" 2021). Audience Project Study (2016) indicated that Norwegian shoppers prefer their national websites for making an online purchase and the number of Norwegian consumers who prefer to pick up their purchase by themselves increased compared to several years ago when people preferred to get the products delivered to their home address. Moreover, 46% of Norwegians claimed that they prefer free delivery, 18% faster delivery, 14% home delivery, and 13 % mentioned having free choice of delivery type could make product deliveries more satisfying (Werliin and Kokholm 2016).

## **2.2 Supply Chain Management**

In today's competitive world, businesses pursue sustainable competitive advantages, and they try to develop a strategy that will make them flexible enough to respond quickly to market changes. Companies need to develop a strategic plan which will define their strategic direction, make different departments cooperate in order to achieve the organization's goals, and support the creation of a unique and valuable position. In the past, companies used to compete as independent entities. However, there is a growing perception in a modern business world that companies entered the stage of internetwork competition where their supply chains (SC) compete. Consequently, the performance and decisions regarding the supply chain play a significant role in the success of the company. Moreover, the SC strategy should create value not only for the business but also for the whole SC network including the end-customer (Lambert and Cooper 2000).

All parties that are directly or indirectly involved in fulfilling a customer request constitute a supply chain. The SC consists of not only the manufacturers and suppliers, but also warehouses, transporters, retailers, and customers. A typical SC includes the following stages: customers, retailers, wholesalers/distributors, manufacturers, component/raw material suppliers (Chopra and Meindl 2016) (See Figure 2.3). According to Chaffey (2009, p. 335), "supply chain management (SCM) involves the coordination of all supply activities



of an organization from its suppliers and delivery of products to its customers”. For the majority of commercial organizations, the author distinguishes between upstream and downstream SC activities, where upstream refers to the buy-side of e-commerce and downstream correspond to the sell-side of e-commerce.

According to Fernie and Sparks (2014), “getting the right products to the right place at the right time” is the main concern for both logistics and retailing. By managing demand and product movement, as well as understanding what is selling in the stores or websites, the retailers can quickly react and respond to sudden changes in demand. In addition, the retailers should be able to move less demand-volatile products more efficiently and cost-effectively.

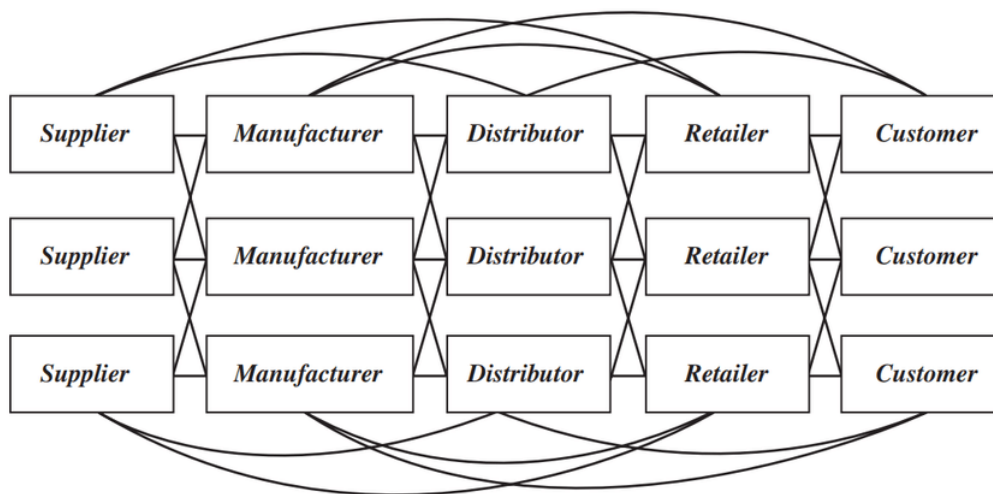


Figure 2.3. Supply Chain Stages (Source: Chopra and Meindl 2016, p. 15)

When a customer shops online, the SC consists of a consumer, e-retailer's website, warehouse, and suppliers. The consumer receives information related to product availability, variety, and pricing through the website, makes a product choice, enters the order information and pays for it. Customer is an integral part of the SC and the main goal of any SC is to satisfy customer needs simultaneously generating profit for itself (Chopra and Meindl 2016).

According to Chaffey (2009), technology plays a vital role in SCM because it facilitates the information flow and transactions among different parties of the SC. Moreover, the Internet creates an opportunity to substantially change the relationship between the company and its channel partners. This process is known as “disintermediation” or “cutting out the middleman” process. The producers gain many benefits from disintermediation in terms of cost savings, some parts of which can be transferred to the consumers in the form of cost

reductions. The graphical illustration of two different types of disintermediation processes is shown in Figure 2.4 above.

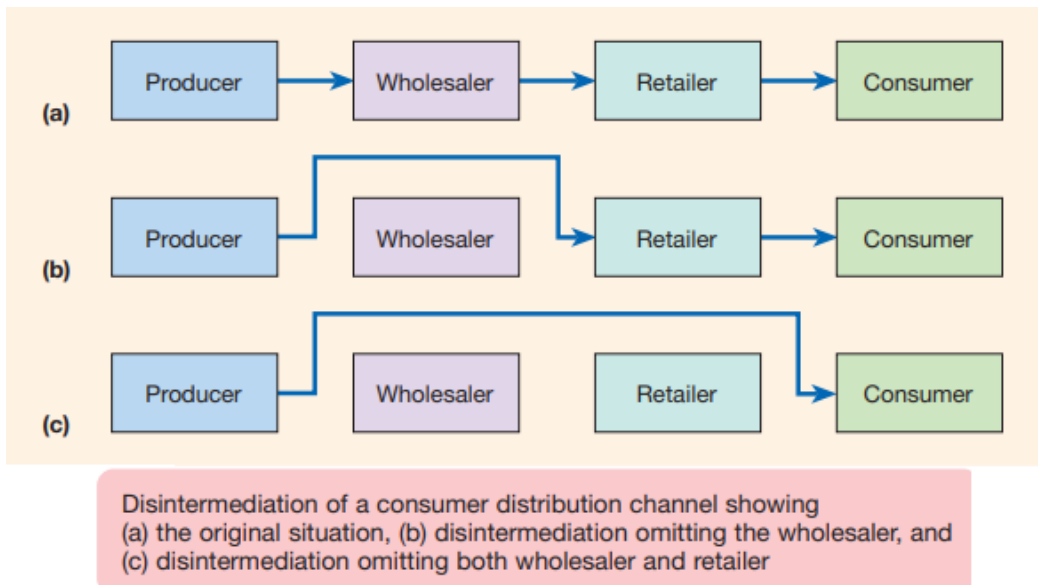


Figure 2.4: Disintermediation of a consumer distribution channel (Source: Chaffey 2009, p.65)

### 2.2.1 Apparel Supply Chain Structure

According to Cao et al. (2008), the long and complex supply pipeline of the apparel SC increases lead time and response uncertainty in the volatile apparel market. The authors divide the apparel SC into several operational players including consumers, retailers, distributors, brand owners, garment producers, fabric manufacturers, yarn manufacturers and fiber suppliers. Moreover, the SC may include at least four functional participants including retailers, brand owners, garment manufacturers and material converters. They also mention that more than one functional role may be dedicated to the same independent entity. For instance, a brand owner can also be treated as a distributor and a retailer. Obser (2015), (Refers to Appelbaum and Gereffi 1994), also indicates the complexity of apparel and textile SC. The author claims that this complicated SC can be divided into sourcing, manufacturing and distribution processes that are necessary to transform the raw materials into garments and make them available to the consumers. Additionally, the author states that these processes are not standardized and are subject to change based on product specifications. However, for simplicity, the author classified the entire SC into five separate networks from the raw materials to the end consumer (See Figure 2.5).

According to Brun and Castelli (2014), the typical structure of SCs in the apparel industry can be divided into two parts: inbound and outbound SCs (See Figures 2.6 and 2.7).

Outbound SC includes the suppliers of raw materials, components and finished goods as well as sub-suppliers. It refers to the flow of raw material to the manufacturing sites. However, outbound SC or distribution channel refers to the distribution of end products to the final customers.

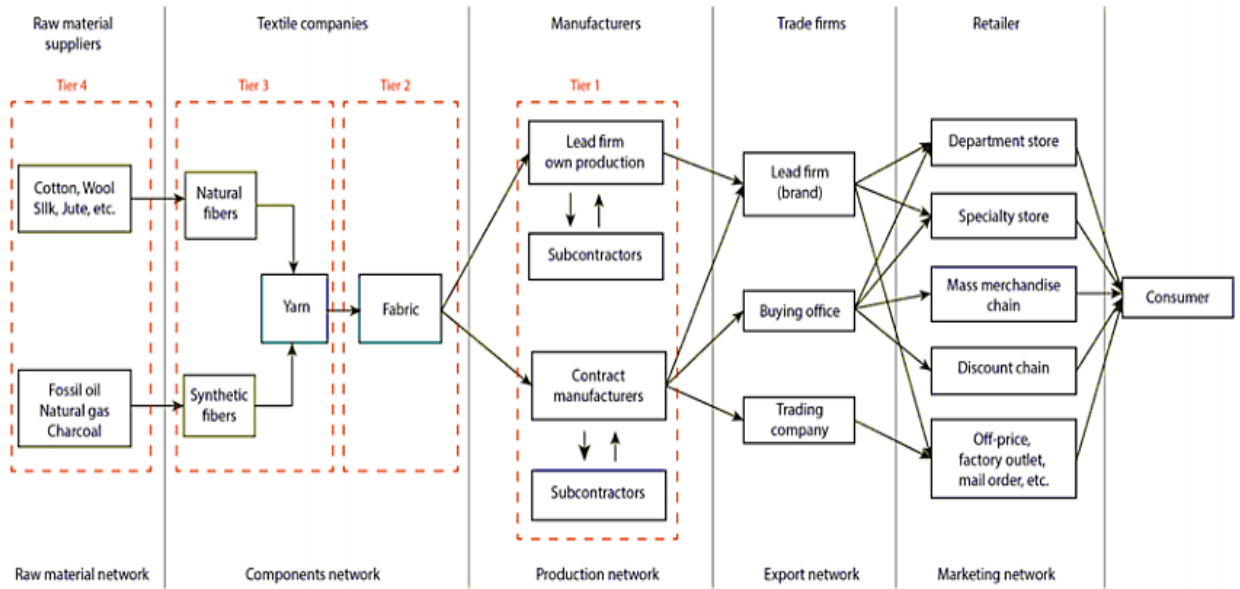


Figure 2.5: The textile and clothing SC (Obser 2015, p.9, refers to Appelbaum and Gereffi 1994, p. 45)

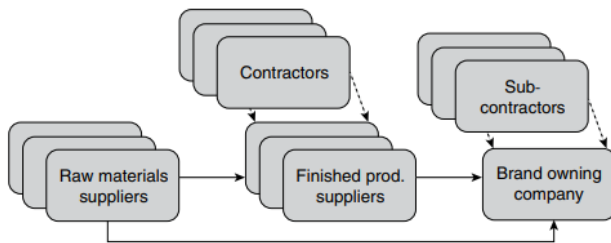


Figure 2.6: Structure of Inbound SC (Brun and Castelli 2014, p.122 )

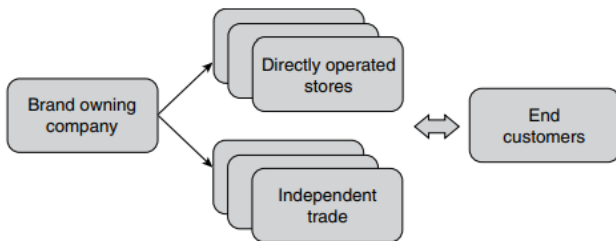


Figure 2.7: Structure of Outbound SC (Brun and Castelli 2014, p.123

## 2.2.2 Supply Chain Strategies in Apparel Industry

Because of rapid changes in fashion markets, the organization's flexibility and responsiveness determine its commercial success or failure (Christopher, Lawson, and Peck

2004). Chaudhry and Hodge (2012) point out that several features of the apparel industry, such as short product life cycles, intense competition, increased fragmentation and long production cycles create challenges in matching supply with demand. This industry includes multiple levels in the value chain and this value chain may vary based on product category and ownership (See Figure 2.8). Fernie and Sparks (2009); Christopher, Lowson, and Peck (2004), mention short life cycle, high volatility and low predictability of market demand, high impulse purchase as marketing factors of the apparel SC's final product, that creates difficulty in matching supply with demand.

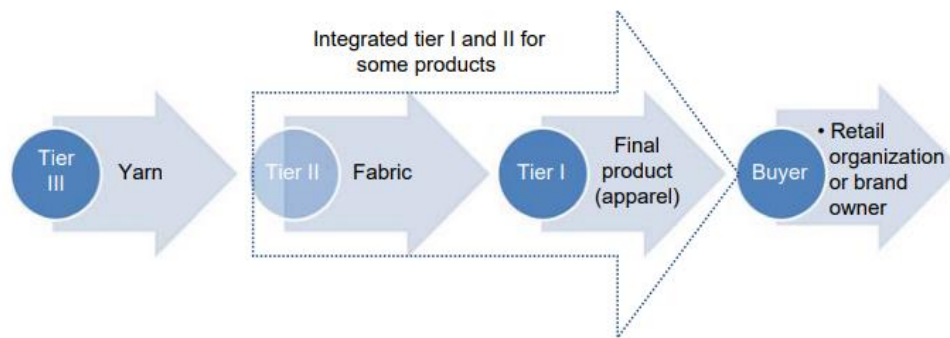


Figure 2.8: Apparel value chain (Chaudhry and Hodge 2012, p. 65)

According to Heinemann and Schwarzl (2010), the products will have significantly shorter life cycles in the future and product innovation will play a substantial role in achieving high performance. The authors claim that “Fast fashion” will be the leading business model not only in the apparel retail category but also in consumer electronics and other retail categories. This business model will require more agile supply chains which will become a great challenge for many retailers. Furthermore, the authors mention that in the future the retailers will identify the value of specialization, especially in logistics, and face new difficulties because resource constraints and more value-conscious consumers will require more sustainable products and environmentally responsible services.

As reported by Bruce and Daly (2011), since enterprises own a limited number of resources, there is a need to reduce wasteful activities and improve customer order demand management. For that reason, lean, agile, and leagile approaches are relevant to implement in the textile and apparel industry that is characterized by intense competition, resource shortages, and where the businesses struggle to achieve speed and efficiency within their SC and serve customer offers effectively.

Christopher, Lowson, and Peck (2004) claim that in the context of SCM, the agility concept refers to responsiveness. The authors claim that the traditional SCs were forecast-driven, inventory-based with long lead times. On the other hand, agile SCs tend to be short,

information-based and demand-driven. Because of its volatile and unpredictable nature, the fashion markets need agility, and an agile SC has several characteristics that can be used to create an agile SC for the enterprises competing in fashion industries.

In the opinion of Baks et al. (2020), the apparel markets are complex, and it is very important to choose the most beneficial SC strategy. The authors compare traditional SC strategy with fast fashion strategy. The main feature of the traditional strategy is production outsourcing to low-wage countries. Although the labor costs are reduced, the transportation time becomes longer which results in the reduction of the logistical processes' flexibility. However, the traditional strategy is widely implemented to produce standardized clothes with minimal costs. In contrast, the fast fashion strategy divides the products into two different groups: basic products that are purchased similarly as in the traditional SC strategy, and fashion clothes that are procured from the producers located close to the point of sale. Although fast fashion strategy is characterized by higher production costs because of incurred high labor costs, it provides more flexibility in reacting to consumer demand. The authors claim that several factors such as consumer preferences and their purchasing behavior, as well as competitors' natures and strategies should be taken into consideration when the companies decide to choose among these two SC strategies (Baks et al. 2020).

Cachon and Swinney (2011) studied apparel SCM by comparing four systems: a traditional, a quick response, an enhanced design, and a fast fashion. The authors claim that the implications of these systems on the purchasing behavior of the consumers are different. For instance, traditional systems are characterized by long lead times and standardized product design. As a result, the product design and inventory levels are decided by the firms before the selling season. Through the quick response systems, supply and demand are better matched because the firms can procure inventory more than once (a long time before the selling season and after receiving a forecast update). The products have a standardized design, but the quick response system reduces the possibility of clearance sales, thus increasing the firm's profits. The enhanced design system is described by long production lead times, but the consumers are offered the products with better designs. Since the consumers get the products that they value more, they do not wait for clearance sales or experience stock-outs. Finally, in the fast fashion system, the characteristics of the enhanced design and the quick response are combined. The authors conclude that employing both strategies simultaneously is more beneficial for the firms, especially when consumers show strategic behavior than employing them in isolation because the fast fashion strategy increases the profits of the firms (Cachon and Swinney 2011).

### 2.2.3 “Last-Mile” Problem in Distribution

Distribution is considered one of the main business areas where the companies may achieve large efficiency gains and save costs. In the B2C channel, the e-fulfillment, particularly the “last-mile” problem of product deliveries to the final customer, is essential for achieving success in the channel. The integration of different functions in the SC created several key themes, such as a shift from push to pull strategy (demand-driven SCs), increased power of customers in the marketing channel, increase in the importance of information systems, concentration on core capabilities, and increased outsourcing of non-core activities to specialists (Ferne and Sparks 2014).

Viu-Roig and Alvarez-Palau (2020); Langley (2019); Durand, Mahjoub, and Senkel (2013); Roel Gevaers, Van de Voorde, and Vanelslander (2011) define the last-mile as a final leg in a B2C delivery service through which the goods are delivered either at the home of the recipient or at a collection point. According to Lim and Winkenbach (2018), fulfillment strategies in a last-mile delivery create consistency in the consumer shopping experience which serves as a powerful driver for success in the retail sector. For achieving better alignment among delivery responsiveness, convenience and product variety, the retailers must redesign their last-mile supply network to survive and grow in the competitive environment (Lim and Winkenbach 2018).

Aryapadi et al. (2020) claim that traditional SC networks are not able to provide same-day delivery with excellent service. Moreover, omnichannel success highly depends on SC, specifically in terms of speed, complexity and efficiency. The authors claim that omnichannel shoppers expect to receive their purchase anytime and anywhere with fast delivery, high convenience and excellent service. The consumer preferences have changed, and new market conditions require more frequent and detailed planning of SC. Research conducted by these authors shows that by improving delivery service, the retailers will be able to differentiate themselves from the competitors and keep shoppers satisfied.

According to Chopra and Meindl (2016), last-mile delivery refers to the product delivery by the distributor or retailer to the consumer’s home. The authors mention that within the whole distribution network, especially when products are delivered to individuals, the transportation costs are the highest. However, the authors also claim that last-mile delivery may be less expensive when the level of aggregation is high. For example, 3PL providers that provide services to a large number of retailers may obtain better economies of scale and provide more efficient last-mile delivery because they can aggregate deliveries and divide

distribution costs among a large number of deliveries. Last-mile delivery cost can be justified also in the settings where the customers are willing to pay for home delivery (for instance, bulky products or buying products in large quantities).

Fernie and Sparks (2014) claim that the reason for the failure of many e-retailers in the past was their inability to provide cost-effective order fulfillment. The authors also state that online shopping demands new logistical requirements. For example, considering the increasing volume of the products to be handled, the need for new distribution centers (DCs) and a larger vehicle fleet arises. Moreover, the customers that are served by the online retailers have different socioeconomic backgrounds, are spread in different locations, and have high logistical expectations requiring quick and reliable delivery at convenient times. The above-mentioned reasons create new challenges for online businesses in the last-mile delivery process. Thus, they need to find a balance between distribution cost, security, and customer convenience.

Roel Gevaers, Van de Voorde, and Vanelslander (2011) analyzed different types of last-mile deliveries and come up with the diagram where the various delivery methods in the last-mile delivery are combined (See Figure 2.9). The authors identified two major issues connected to the last-mile delivery process. Firstly, they claim that the absence of the customers at home, especially when their signature is required, is the most critical issue incurring during home deliveries, and without the arrangement of a delivery time the failure rate is high. The second issue is efficiency reduction and cost increase as a consequence of inadequate market density and delivery mass (traveling long distances for a single parcel delivery).

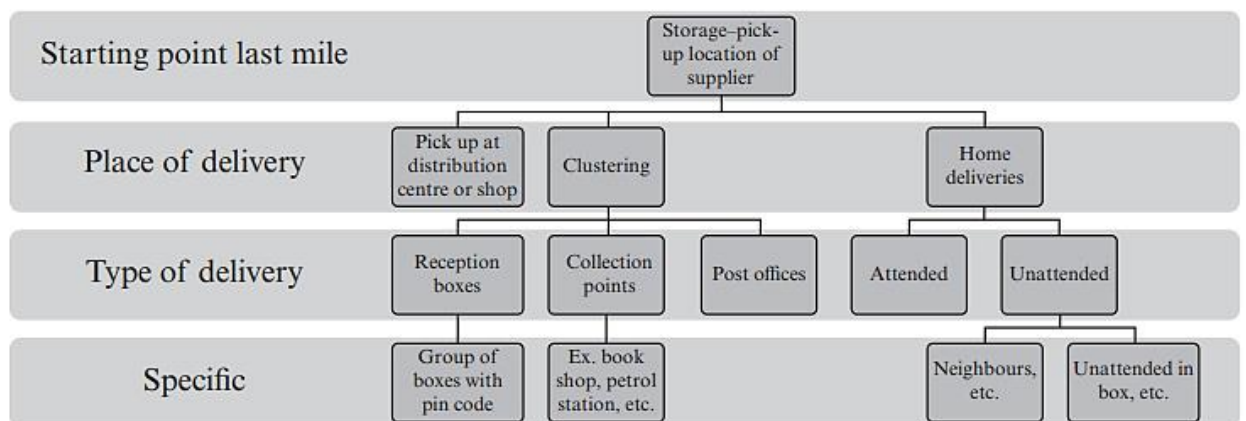


Figure 2.9: Last-mile delivery methods (Gevaers, Van de Voorde and Vanelslander 2011, p. 59)

According to Aryapadi, et al. (2020); Olsson, Hellström, and Pålsson (2019); Allen, Thorne, and Browne (2007), the efficiency of last-mile delivery depends on different factors including consumer density and time windows, shipment size and homogeneity, delivery



fragmentation, delivery speed. As a result, delivering products to the recipient's preferred destination point is logistically challenging, inefficient and expensive (Olsson, Hellström, and Pålsson 2019; R. Gevaers, Van de Voorde, and Vanelander 2014; Fernie, Sparks and McKinnon 2010). As a consequence of several factors, such as high competition among retailers, consumer-driven economy, reverse logistics, environmental issues (Cárdenas, Beckers and Vanelander 2017), issues related to failed deliveries (Cárdenas, Beckers and Vanelander 2017; van Duin et al. 2016), increase in the number of direct-to-consumer deliveries, small size and high frequency of deliveries (Viu-Roig and Alvarez-Palau 2020; Stumm and Bollo 2016), online delivery costs are high. As reported by Langley (2019); Stumm and Bollo (2016) delayed, misplaced, lost or damaged deliveries (delivery condition) as well as, security issues related to the shipment, size of shipment, lack of capability to accommodate special shipments are most frequent issues connected to the last-mile delivery process.

Many e-retailers use third-party logistics providers (3PL) to deliver the products to consumers (Langley 2019; Turban et al. 2015; Durand, Mahjoub, and Senkel 2013). They may use the country postal system or private shippers such as UPS, DHL or FedEx. To reduce delivery costs to consumers and provide faster services, some e-retailers prefer to have their fleet of delivery vehicles (Turban et al. 2015). As stated by Heinemann and Schwarzl (2010), online retailers can benefit from the standard offers of specialized fulfillment vendors that offer a wide spectrum of services from pure shipment to full service. The outsourcing of specific activities to logistics service providers (LSP) is common in Europe and it allows the businesses to forecast their operational costs and do business planning more accurately. The authors also claim that LSPs play a significant role in optimizing the SC. Outsourcing of non-core activities enables businesses to concentrate on their core competencies and fulfill logistics tasks not only cheaply but also more quickly. However, outsourcing not only carries advantages but also has some drawbacks. The authors indicate insufficient control over differentiating processes and dependence as major drawbacks because they lose the last point of contact with the buyers during the delivery. Therefore, the logistics outsourcing process must be carefully prepared and planned (Heinemann and Schwarzl 2010). While Heinemann and Schwarzl (2010) describe challenges from the businesses' perspective, Kütz (2016) mentions difficulties faced by LSP. The author identified several challenges for forwarding agencies and trucking companies to address related to order fulfillment and delivery. For instance, consumers' presence at home, alternative delivery points, delivery to a neighbor, trust in the neighbor,



delivery proof if the neighbor signs, packaging requirements, the risks of transportation damages are issues that LSPs need to consider carefully.

#### **2.2.4 The Impact of Covid-19 on Last-Mile Delivery**

The closure of offline retail stores to slow the rapid spread of the Covid-19 increased the importance of online shopping among the consumers to satisfy their consumption needs. To quickly respond to sudden changes in consumer demand, especially during the Covid-19 crisis become a priority for many retailers operating in the apparel industry. A decrease in sales volumes led to overstocked products making the companies operating in this industry to suffer. In order to avoid those overstocked products becoming unfashionable and obsolete, the retailers should be able to anticipate consumer behavior and start to build, improve and promote their online stores (Koch, Frommeyer and Schewe 2020).

According to Deloitte Digital report (2020), the Covid-19 pandemic increased demand for product deliveries. As stated in the report, the last mile will become more important than ever. Businesses have begun to concentrate on reevaluating their business models and get closer to the consumers. The retailers with their delivery network were in a more favorable position than those who relied on logistics service providers. Since the consumers were dependent on online purchases, many retailers started a collaboration with last-mile logistics companies to survive and meet consumer expectations. However, increased volume of deliveries put pressure on logistics companies to improve efficiencies. Considering the fact that the consumers have used to have fast deliveries for their purchases, the businesses should try to solve the challenge of last-mile delivery by inventing successful last-mile delivery models that will create a more positive experience for consumers, instead of just having the items delivered (Page and Stephens 2020).

### **2.3 Consumer's role and preferences in the last-mile delivery process**

#### **2.3.1 Consumer experience in last-mile delivery**

Nowadays, the consumers who make online purchases have high expectations and their online shopping experience will provide insights for e-commerce providers to understand

what the consumers demand. Research conducted in 2016 by MetaPack among 3589 online consumers from six different countries about the state of e-commerce delivery indicates that the success of the retailers in the competitive e-commerce market highly depends on the shopper's delivery experience. According to the report, 43% of surveyed consumers mentioned that the negative delivery experience will prevent them to purchase from the same retailer within a month. Moreover, 38% of respondents indicated that they will never make a repetitive purchase from that retailer. However, 87% of consumers stated that the possibility of repeat purchases from the same online merchant is high followed by the positive delivery experience (MetaPack 2016).

According to Joerss, Neuhaus and Schröder (2016), the success of e-commerce players in the marketplace depends on how the online customers value delivery options variety and delivery service quality because these two criteria play a significant role in the decision-making process of consumers. Therefore, the majority of e-commerce players are trying to offer the best customer experience during the delivery process. As stated by Maull, Geraldi and Johnston (2012), customers are a fundamental part in the value creation of the service process which makes them an integral part of the SC. Moreover, as claimed by Heidenreich, et al. (2014), the involvement of customers in the service delivery process is called customer co-creation. The involvement of the customers in a last-mile delivery process may start with providing information as input for the service and in the later stages of the delivery process, they may perform physical labor by picking up the packages themselves from different pick-up locations (Bouwman 2017).

Vanelslandera, Deketele and Van Hove (2013) claim that the contact between the e-retailer and customer occurs during the delivery process, thus delivery is an important factor for customer satisfaction. As stated by Collier and Sherrell (2009), customer convenience has a direct and positive impact on consumer satisfaction and for the last-mile delivery, the reduction of physical and cognitive efforts for the customers will make the process more convenient, hence increase customer satisfaction. In the opinion of Oliver (2010), customer satisfaction has a significant impact on e-retailers' success because it drives repeat sales and customer loyalty.

### **2.3.2 Consumer behavior**

Sethna and Blythe (2016, p.6) define a consumer as “*someone who makes a decision to buy a product*”. The authors claim that the consumer is the center of everything that the

enterprise does and it is fundamental to understand how and why the consumers make their purchasing decisions. Walters (1974, p. 4) provided a more detailed description of a consumer and defined consumer as “*an individual who purchases, has the capacity to purchase goods and services offered by marketing institutions in order to satisfy personal or household needs, wants, or desires.*” The author also defines consumer behavior as “*the process whereby individuals decide whether, what, when, where, how, and from whom to purchase goods and services*” (Walters 1974, p.7; Kotler 1997). A more recent definition of consumer behavior is given by Solomon, et al. (2006, p.6). Consumer behavior is referred as a “*study of the processes involved when individuals or groups select, purchase, use or dispose of products, services, ideas or experiences to satisfy needs and desires.*” However, the authors mention the possibility of the involvement of different people in a process. For instance, the buyer and user of the product may be different persons, or by providing recommendations (positive or negative), a person may affect another person’s purchasing decision and act as an influencer.

Howard (1994) points out that an in-depth understanding of buying processes was the main objective of consumer behavior pioneer models. According to Schiffman and Kanuk (2007), buyer’s behavior is understood and analyzed by using consumer behavior theory as a framework. The authors described consumer behavior as a searching process that is needed to buy, use, evaluate and dispose products and services. In addition, they refer to consumer behavior as a decision-making process of consumers on how to spend their available resources, such as time, money and effort, to buy consumption-related items. According to Furaiji, Łatuszyńska and Wawrzyniak (2012), studying consumer buying behavior, where the consumer may act as a payer, buyer, or user, plays a significant role in consumer behavior research. As claimed by Engel, Kollat and Blackwell (1973), consumer behavior conventionally comprises five different stages: problem recognition, information search, evaluation of alternatives, purchase decision, and post-purchase behavior. As reported by Furaiji, Łatuszyńska and Wawrzyniak (2012), this is mostly a psychological process that is difficult to predict. Kotler and Armstrong (2014, p.159) identify several factors that have an impact on consumer purchasing decisions. The authors mention that the most popular factors are the cultural, social, personal, and psychological characteristics of a person. Furaiji, Łatuszyńska and Wawrzyniak (2012) add also marketing mix practiced by enterprises for a particular product.

According to Johnson, Pham and Johar (2007), consumer behavior theory is also called “Utility Theory”. From an economics perspective, the theory analyzes the way of

distributing the income among different goods by consumers in order to maximize value (Salvatore 2008; Johnson, Pham and Johar 2007). As stated by Schiffman and Kanuk (2007), consumers are considered rational decision-makers and they are interested in utility maximization. Salvatore (2008, p.58) defines utility as “*the property of a good that enables it to satisfy human wants*”. Since we consider last-mile delivery as a service, we will identify the features of delivery service that play a significant role in satisfying consumer needs.

### 2.3.3 Consumer preferences and decision making

As a marketing term, consumer preference means the possibility to select one thing over another (Kontot, Hamali and Abdullah 2016). In economics, consumer preferences are described by individual tastes and measured by utility obtained from different commodity bundles. Preferences are considered independent of an individual’s income and commodity prices (Sowunmi, Omigie and Daniel 2014; Salvatore 2008). As stated by Voicu (2013), to understand consumer preferences, it is fundamental to determine consumer needs and requirements related to the functionality involved in the purchase, expected emotional results and subjective standards that impact consumers during their decision-making process of selecting products or services. According to Hawkins and Mothersbaugh (2010), there are different ways, from simple to complex, the customer makes a choice decision. During the decision process, customers gather relevant information about product attributes based on their preferences, evaluate gathered information and assign a value to select from available alternatives.

The traditional model of the consumer decision-making process includes five steps (See Figure 2.10) that consumers move when they purchase products or services. It is important to understand these steps to be able to communicate with consumers and persuade them to make a purchase (Stankevich 2017). As indicated by Kotler (1997), consumers are viewed as being cognitive and to some degree emotional, and ordinarily, they approach the process of decision-making from a rational perspective. This view is also reflected in a five-stage model (See Figure 2.10)

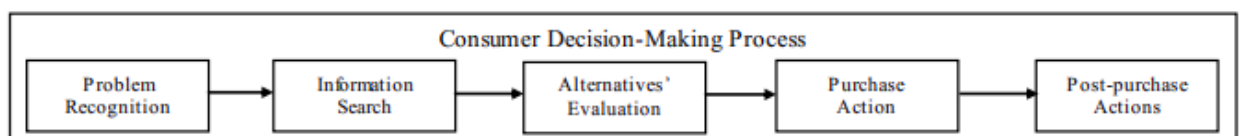


Figure 2.10: Five-stage model of consumer-buying process (Stankevich 2017, p. 10)

In the first stage (problem/need recognition) the consumers realize that they need to buy something. In the second stage (information search), the consumers start to examine different alternatives that can satisfy their needs. In the third stage (alternatives evaluation), the consumers are looking for the best deal and their experiences or emotional connections with the product or service as well as advertising campaigns may have a high impact on their decision-making. Consumer's best deal may depend on several attributes (price, quality, purchase location, etc.) that are more relevant to them. After completing an evaluation of alternatives, the consumer decides to buy a product or service which is the fourth stage of a process. In the last stage (post-purchase), the consumers evaluate and review the product/service to express their satisfaction or dissatisfaction (Stankevich 2017).

### **2.3.4 Online buying process**

In online trade, the sales process is channel-specific. At the beginning of the order, the collection of the information about customers, products, services as well as the methods of payment and delivery is very important. Moreover, it is important to make it possible for customers to add and remove the products from the order list easily. The methods of payment and delivery should also be easily manageable, and data should be saved and be easily accessible by the customers (Heinemann and Schwarzl 2010).

According to Chaffey (2009), the number of consumers making online purchases continues to grow. However, based on consumer behavior research, it takes time for consumers to get the confidence to purchase online. With the increase of confidence, the frequency and number of online purchases are likely to increase, and it is a good potential for e-retailers to increase sales. Moreover, it is fundamental for companies to understand how a consumer make changes among the online and offline channels to devise an appropriate online marketing communication strategy to support consumers in channel changing process.

The E-commerce sales process describes a general pattern of business making in delivering products or providing services and receiving payments for it (Kütz 2016). Heinemann and Schwarzl (2010) divide the process of online retail purchase process into 3 different phases: before, during and after purchase (See Figure 2.11).

The retailers initiate the attraction of potential customers with product offers in the pre-purchase phase. The transition from the pre-purchase phase to the purchase phase happens when the customers click on the "order" button after the selection of the product. This phase refers to the business agreement between the buyer and seller. Online payment and delivery

of products take place within this phase as well. The post-purchase phase starts when the retailers ask for customer feedback and manage customer complaints. This phase also includes the return processing process (Heinemann and Schwarzl 2010). In our research, we will concentrate on the delivery/fulfillment features that affect the consumers' decision-making process when they purchase apparel online.

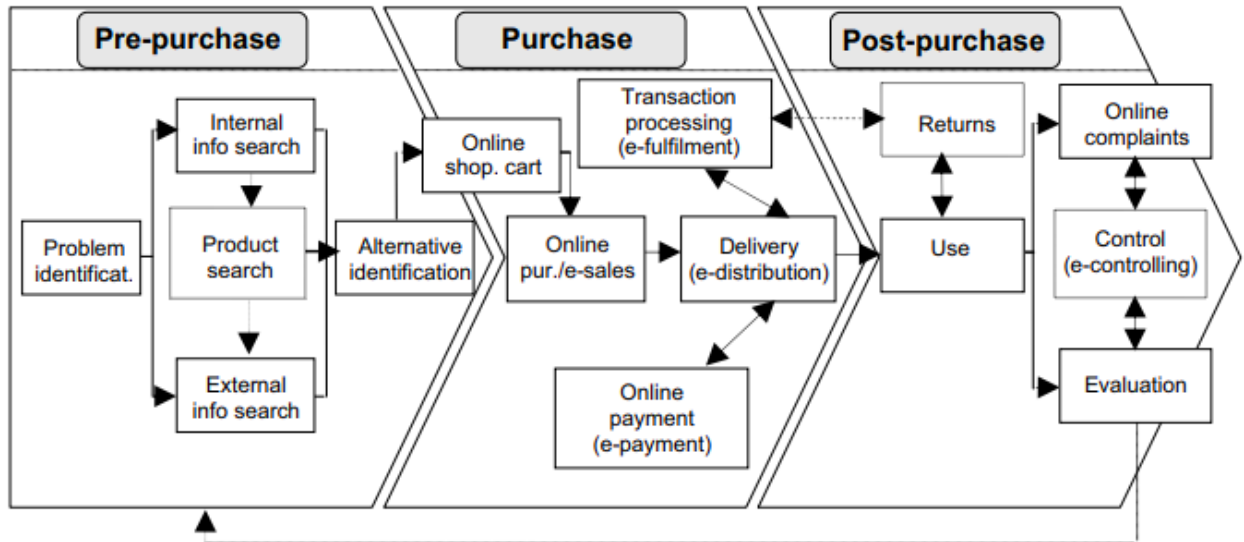


Figure 2.11: Online buying process areas (Heinemann and Schwarzl 2010, p.40, Refers to Kollmann 2007, p. 149)

### 2.3.5 Consumer segments

According to DIBS' annual report (2018) on e-commerce for Nordic countries, Norwegian consumers are fond of buying physical goods online. With the growth of e-commerce, buying clothes shoes and accessories online has become common among Norwegians. In 2018, 58% of Norwegian consumers bought clothes, shoes and accessories online. Moreover, 53% of the consumers between the age of 25-44 bought clothes from abroad (Tell, et al. 2018).

In DIBS's annual report (2018), online consumers are divided into five groups: young families without children, young families with young children, families with older children, working adults without children and pensioners (See Figure 2.12). The analysis results indicated that 71 % of young families with young children and 67 % of families with older children make online purchases via mobile devices. Moreover, young families without children and families with young children represent the categories that have a high percentage of online purchases from abroad (59% and 58%, respectively). The lowest share

of shopping via mobile devices have pensioners (6%), but pensioners represent a family group that mostly prefers to pay by card (Tell, et al. 2018).

	YOUNG FAMILIES WITHOUT CHILDREN	YOUNG FAMILIES WITH YOUNG CHILDREN	FAMILIES WITH OLDER CHILDREN	WORKING ADULTS WITHOUT CHILDREN	PENSIONERS
Have bought food online	21%	31%	24%	11%	6%
Purchases via mobile devices	70%	71%	67%	43%	33%
Prefer to return online purchases in a physical store	41%	43%	40%	38%	43%
Have cancelled an online purchase	52%	46%	50%	48%	39%
Have bought online from abroad	59%	58%	55%	50%	52%
Prefer to pay by card	53%	49%	53%	62%	70%

Figure 2.12: Online consumer groups (Tell et al. 2018, p. 126)

### 2.3.6 Consumer reasons to make and cancel an online purchase

As stated in the DIBS' annual (2018) report on e-commerce for Nordic countries, convenience is everything for Norwegian consumers. Hence, no surprise that 25% of Norwegian consumers claim that they shop online because it is time-saving and convenient. Other important factors that Norwegian online shoppers value are lower prices (24%), easiness in comparing products and prices (13%), the Internet is always accessible (13%) and there is no need to wait until the stores open. Other factors mentioned by Norwegian consumers as a reason to shop online are the availability of desired products only in the online shops (14%) as well as a bigger selection (9%) (See Figure 2.13).

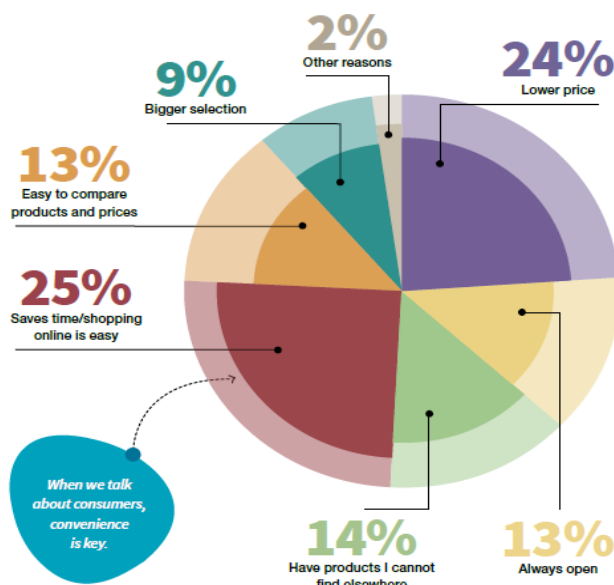


Figure 2.13: Reasons to buy online (Tell et al. 2018, p. 124)



The report also indicates that the main reason for consumers to cancel the online purchase is the total high price of purchase including delivery (56%). The second most-frequent reason for canceled purchases among Norwegian consumers is the annoying registration process. Uncertain general terms and conditions that include delivery and return policies are the reasons to interrupt an online purchase among 14% of consumers (See Figure 2.14).

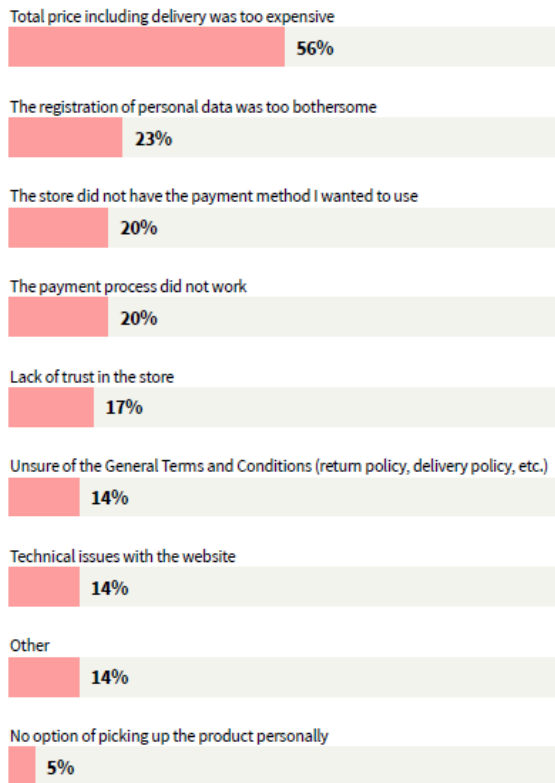


Figure 2.14: Reasons to cancel online purchase (Tell et al. 2018, p. 129)

In addition, there is a huge difference between the shopping preferences of old and young consumers. For example, young consumers are more price-sensitive, and they may cancel their online purchase because of high delivery prices, while the older shoppers' main concerns relate to security (Tell et al. 2018).

## 2.4 Overview of Attributes

Some features of logistics services can influence the purchasing decision of consumers for which online retailers compete over fiercely. Evaluating the effects of different delivery attributes on consumers' decision-making may influence the strategies of online retailers and have a significant impact on SC performance. In the following subchapters, we examine delivery attributes separately that will be used to conduct our study to understand their importance for retailers and consumers.



### **2.4.1 Delivery Location**

When consumers make online purchases, more often they are offered two locations during last-mile delivery, such as home delivery or other address of consumer choice and local pick-up points (Rai, Verlinde and Macharis 2018). Home delivery is the most environmentally unfriendly option (Mangiaracina, et al. 2015). Last-mile delivery occurs during working hours when many consumers are at their workplace. As a result, the rate of unattended or failed deliveries is high for this delivery option, which creates sustainability issues and increases inefficiency because of repeated deliveries (Visser, Nemoto and Browne 2014). Parcel pick-up points, especially located in busy or residential areas, will solve inefficiency issues by increasing consolidation (Xiao, et al. 2017; Visser, Nemoto and Browne 2014) and will result in 100% parcel delivery (Van Duin, et al. 2016). Many omnichannel retailers use their stores as a pick-up point which allows them to increase the overall efficiency of their SC by reducing the number of expensive home deliveries (Hübner, Kuhn and Wollenburg 2016). According to Buldeo Rai, et al. (2017) in-store pick-up points are more preferred options among consumers compared to the regular pick-up points that are managed by LSPs because in-store pick-up points provide several advantages to the consumers, such as easy return and immediate refund for products, possibility to receive specialized advice from personnel and make additional purchases. However, the results of the study conducted by Gawor and Hoberg (2018) indicate that home delivery is a more preferred option among omnichannel consumers compared to pick-up points.

### **2.4.2 Delivery Speed**

Amorim, et al. (2020) define delivery speed as the expected duration between order placement and delivery and consider it as one of the most widely studied delivery service attributes. As stated by the authors, numerous studies found a positive and significant connection between delivery speed and sales relevant to the retail context. Lim and Dubinsky (2004) claim that retailers use shorter delivery times as a main source of competition. A detailed review of existing literature regarding delivery speed within a wide variety of contexts is given by Daugherty, Bolumole and Grawe (2019).

Hua, Wang and Cheng (2010) define delivery lead time (DLT) as the amount of time that is needed for purchased items to arrive at the location where they are needed after customers place an order. According to Marino, Zotteri and Montagna (2018), customers consider DLT

as the main factor when they make purchasing decisions and by offering shorter delivery times, retailers can increase their competitiveness. Waiting time plays a significant role in a service industry because it reflects the match between supply and demand (Mittal 2016). Parasuraman, Zeithaml and Berry (1985) also claim that waiting time is a major determinant of service quality. Therefore, as reported by Marino, Zotteri and Montagna (2018), service management studies tried to explore methods and ways to reduce waiting times. Matching demand and supply plays a significant role in the SCM domain, thus addressing time issues is also crucial in this field (Chopra and Meindl 2016). Some studies examined customer sensitivity to DLT (de Treville, et al. 2014), the importance of delivery time reduction to increase convenience to customers (Goebel, Moeller and Pibernik 2012) and the advantages of reducing DLT (Tersine and Hummingbird 1995). Hua, Wang and Cheng (2010); Gupta, Su and Walter (2004) state the importance of DLT in B2C e-fulfillment. However, Hua, Wang and Cheng (2010) also claim that short DLT in most cases increases logistics cost. Longer lead times lead to the reduction of customer loyalty and channel acceptance. Therefore, it is essential to find a balance between delivery efficiency and economies of scale and risk pooling (Agatz, Fleischmann and van Nunen 2008). A recent study conducted by Xu, Munson and Zeng (2017) about e-service offerings revealed that fast delivery (within 24 hours) leads to an increase in consumer satisfaction for the products devoted to pleasure, such as toys, wine and jewelry because these product types are bought by online consumers on impulse, and they want to possess them as soon as possible. Heinemann and Schwarzl (2010) claim that by informing consumers about how long to expect delivery to take or warning about a possible delay, the retailers can improve relationships with the consumers and avoid misunderstandings on the consumer side.

### **2.4.1 Delivery Cost**

Delivery cost plays a substantial role in recovering logistics costs for online retailers (Lewis 2006). Moreover, charging low delivery fees or offering free delivery to consumers can be a powerful marketing tool for impacting their purchasing decision as well as purchasing patterns which will contribute to the acquisition and maintenance of consumers (Becerril-Arreola, Leng and Parlar 2013; Lewis 2006). Turban, et al. (2015) claim that delivery fees can be an important factor in the competition. According to Koukova, Srivastava and Steul-Fischer (2012), online consumers assess threshold-based free shipping and shipping with flat-rate differently based on the value of the order being higher or lower than the threshold.

However, a study conducted by Lantz and Hjort (2013) reveals that free delivery policy results in a rise in the total number of online orders and a reduction in the average value of the bought items. Rao, et al. (2011) claim that consumer satisfaction with delivery service price has a positive impact on overall purchase satisfaction and consumer loyalty. A more recent study performed by Gawor and Hoberg (2018) revealed that a shipping price is the most important attribute that consumers take into consideration when they choose among omnichannel retailers. As reported by Li, et al. (2020), on the one hand, businesses may incur losses or may be unable to maintain sustainable operations if they do not reduce delivery service fees. On the other hand, only the reduction of delivery service costs does not guarantee success if the businesses do not pay attention to delivery capabilities, such as speed, punctuality, and reliability. The negligence of delivery capabilities may result in customer dissatisfaction and in case of not addressing the issues immediately, the businesses will lose a large number of their customers. Thus, as claimed by the authors, it is important to consider delivery service cost and delivery capabilities simultaneously during the selection of logistics service mode for last-mile delivery.

#### **2.4.4 Return Cost**

Effective and efficient management of product returns plays a significant role in increasing the company's profits, as well as customer service levels which will lead to customer satisfaction and retention (Srivastava and Srivastava 2006). According to Cullinane, et al. (2017); de Leeuw, et al. (2016), returning goods from consumers to e-tailers is a complex process and many companies struggle to deal with reverse logistics systematically. The authors claim that clothing industry returns range from 25% to 60% and reverse logistics costs have a substantial impact on e-tailers' operational profits. Aitken and Harrison (2013) state that because of the high volume of products returned by consumers to online apparel retailers, it is necessary to have major reverse logistics operations. Inefficient management of the return process may seriously affect the retailer's profitability (Ghezzi, Mangiaracina and Perego 2012). As reported by Cullinane, et al. (2017), commercial agreements and legal obligations are the main sources of the return process in the online apparel industry. Therefore, it is beneficial for retailers to minimize reverse flows. Nevertheless, the authors also claim that a proper return policy may increase consumer satisfaction and lead to the increased sales volumes. Heinemann and Schwarzl (2010) share the same opinion about return policy. As stated by the authors, an easy and usually free of charge product return policy is an important condition to maintain good business relationships with the consumers.

However, Lantz and Hjort (2013) found that a free return policy, on the one hand, leads to an increased order frequency and probability of return items, on the other hand, to the reduction of the average value of orders and bought items. de Leeuw, et al. (2016), conclude that offering multiple return options to the consumers and simultaneously concentrating on the efficiency of handling the returns, may increase retail revenues.

#### 2.4.5 Logistics services of Norwegian online fashion stores

To make our study more reliable and conforming to the current market situation, we examined the five most popular online stores in the fashion segment in Norway. According to Statista (2021e), the top five online stores in the fashion segment based on their annual e-commerce sales in 2018, were [zalando.no](https://www.zalando.no), [hm.com](https://www.hm.com), [xxl.no](https://www.xxl.no), [nelly.com](https://www.nelly.com) and [ellos.no](https://www.ellos.no) (See Figure 2.15).

The market leader in 2018 with 98.2 million US dollars revenue in Norway was zalando.no followed by hm.com with 83.5 million US dollars of sales revenues. The information searched from the websites of online stores is categorized according to the logistics services offered by the stores and demonstrated in Table 2.1 below. Table 2.1 contains main information about delivery attributes (delivery location, delivery speed, delivery cost and return policy) as well as supplementary information (store types, payment methods, logistics service providers, etc.).

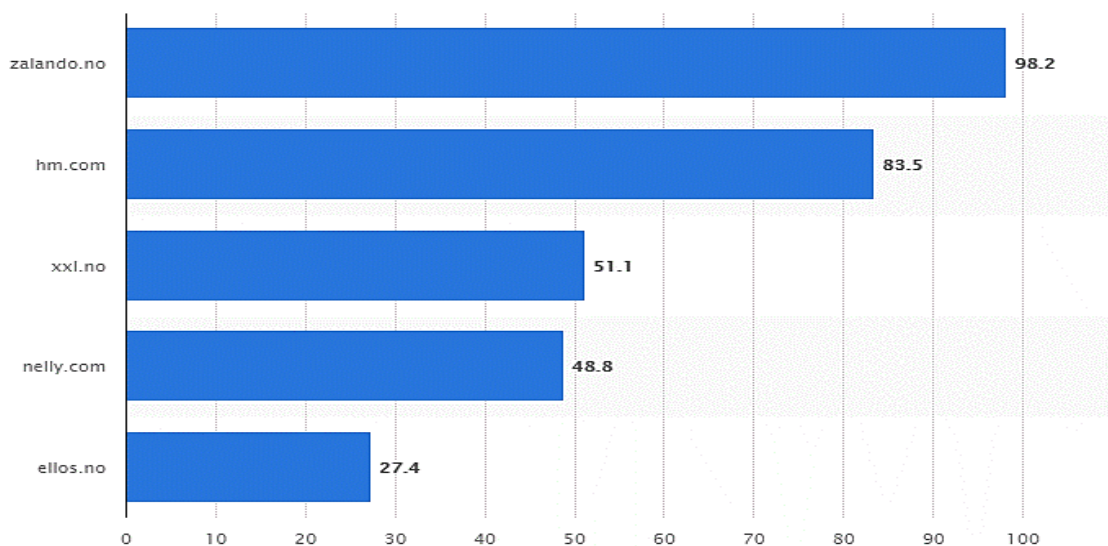


Figure 2.15: Most popular online stores in the fashion segment in Norway in 2018 by e-commerce net sales (in million US dollars)

Table 2.1 - General information and logistics services offered by five Norwegian popular online stores in the fashion segment

Name	1. zalando.no	2. hm.com	3. xxl.no	4. nelly.com	5. ellos.no
<b>Store Type</b>	e-tailer	omni-channel	omni-channel	e-tailer	e-tailer (only 2 stores in Sweden)
<b>Delivery Location</b>	<ul style="list-style-type: none"> <li>• standard</li> <li>• home delivery</li> </ul>	<ul style="list-style-type: none"> <li>• standard</li> <li>• in store pick-up</li> <li>• home delivery</li> </ul>	<ul style="list-style-type: none"> <li>• mailbox/post office</li> <li>• in store pick-up</li> </ul>	<ul style="list-style-type: none"> <li>• standard</li> <li>• pick-up point</li> </ul>	<ul style="list-style-type: none"> <li>• mailbox/post office</li> <li>• home delivery</li> </ul>
<b>Delivery Speed</b>	4-7 working days	<ul style="list-style-type: none"> <li>• 2-4 working days for standard, in store pick-up &amp; home delivery</li> <li>• Express delivery - 1-2 working days</li> </ul>	<ul style="list-style-type: none"> <li>• 1-4 working days</li> </ul>	<ul style="list-style-type: none"> <li>• 4-7 working days for standard delivery</li> <li>• Express delivery – 1-2 working days</li> </ul>	<ul style="list-style-type: none"> <li>• 3-5 working days for standard delivery</li> <li>• 2-4 days for home delivery</li> <li>• Express delivery- the next day</li> </ul>
<b>Delivery Cost</b>	<p>Standard (Postbox)</p> <ul style="list-style-type: none"> <li>• Free for orders &gt; NOK 229</li> <li>• NOK 39 for orders &lt; NOK 229</li> </ul> <p>Home delivery</p> <ul style="list-style-type: none"> <li>• NOK 25 for orders &gt; NOK 229</li> <li>• NOK 99 for orders &lt; NOK 229</li> </ul>	<p>Standard</p> <ul style="list-style-type: none"> <li>• Free for orders &gt; NOK 300</li> <li>• NOK 49.90 for members</li> </ul> <p>In-store pick-up</p> <ul style="list-style-type: none"> <li>• Free for orders &gt; NOK 300</li> <li>• NOK 49.90 for members</li> </ul> <p>Home delivery</p> <ul style="list-style-type: none"> <li>• Free for orders &gt; NOK 499 and plus members</li> <li>• NOK 79.90 for members</li> </ul> <p>Express delivery</p> <ul style="list-style-type: none"> <li>• NOK 79.90</li> </ul>	<p>Mailbox/post office</p> <ul style="list-style-type: none"> <li>• Free for orders &gt; NOK 1000</li> <li>• NOK 59</li> </ul> <p>In store pick-up</p> <ul style="list-style-type: none"> <li>• Free</li> </ul>	<ul style="list-style-type: none"> <li>• Free for orders &gt; NOK 299</li> <li>• NOK 49.9 for orders &lt; NOK 299</li> </ul>	<p>Mailbox/post office</p> <ul style="list-style-type: none"> <li>• Free for orders &gt; NOK 499</li> <li>• NOK 49.9 for orders &lt; NOK 499</li> </ul> <p>Home delivery</p> <ul style="list-style-type: none"> <li>• NOK 95</li> </ul> <p>Express delivery</p> <ul style="list-style-type: none"> <li>• NOK 69</li> </ul>
<b>Delivery Areas</b>	Almost all areas in Norway (NO delivery to Jan Mayen and Svalbard)	NO delivery to Svalbard and some delivery points in Kvalfjord, Hakkstabben, Kongshus, Loppa, Skavnakk	Almost all areas in Norway (NO delivery to Svalbard)	Almost all areas in Norway (NO delivery to Svalbard)	Almost all areas in Norway (NO delivery to Svalbard)
<b>Delivery Days</b>	Monday-Friday	7 days a week	Monday-Friday	Monday-Friday	Monday-Friday

<b>Payment Method</b>	<ul style="list-style-type: none"> <li>• Invoice – 30-day payment deadline</li> <li>• Card</li> <li>• 3D Secure Debit Card</li> <li>• Gift Card</li> <li>• PayPal</li> <li>• Prepayment</li> </ul>	<ul style="list-style-type: none"> <li>• H&amp;M Klarna</li> <li>✓ Invoice– 30-day payment deadline</li> <li>✓ Divide – payment division into monthly installments</li> <li>• Card</li> <li>• PayPal</li> <li>• Gift Card</li> </ul>	<ul style="list-style-type: none"> <li>• Klarna invoice – 14 days payment deadline</li> <li>• Card</li> <li>• Gift Card</li> <li>• 3D Secure Card</li> </ul>	<ul style="list-style-type: none"> <li>• Qliro Invoice – 14-day payment deadline</li> <li>• Card</li> <li>• Partial Payments</li> <li>• PayPal</li> <li>• Gift Card</li> </ul>	<ul style="list-style-type: none"> <li>• Invoice</li> <li>• Cards</li> <li>• Partial Payments</li> <li>• Account</li> </ul>
<b>Logistics Provider</b>	<ul style="list-style-type: none"> <li>• PostNord</li> </ul>	<ul style="list-style-type: none"> <li>• Bring</li> <li>• Helthjem</li> </ul>	<ul style="list-style-type: none"> <li>• PostNord</li> <li>• Bring</li> </ul>	PostNord	PostNord
<b>Return Policy</b>	<ul style="list-style-type: none"> <li>• 100 days right of return</li> <li>• free for standard delivery</li> <li>• 1-3 weeks transaction process</li> </ul>	<ul style="list-style-type: none"> <li>• 30 days right of return</li> <li>• free for members &amp; in-store return, NOK 39.90 for non-members</li> <li>• up to 14 days transaction process</li> </ul>	<ul style="list-style-type: none"> <li>• 100 days right of return</li> <li>• Free for in-store return and exchange &amp; NOK59 for standard delivery</li> <li>• 7-10 working days transaction process</li> </ul>	<ul style="list-style-type: none"> <li>• 14 days right of return</li> <li>• Free return for new order within 24 hours &amp; NOK 39</li> <li>• up to 14 days transaction process</li> </ul>	<ul style="list-style-type: none"> <li>• 30 days right of return</li> <li>• NOK49 return fee</li> <li>• up to 14 days transaction process</li> </ul>
<b>Delivery Information</b>	SMS, e-mail	e-mail	SMS	e-mail	SMS, e-mail
<b>Sustainability Policy</b>	<ul style="list-style-type: none"> <li>• social, environmental, and animal welfare standards</li> </ul>	<ul style="list-style-type: none"> <li>• Supplier information - where and how the products are made</li> <li>• Recycling information</li> <li>• In-Store recycling boxes</li> </ul>	<ul style="list-style-type: none"> <li>• Supplier control</li> <li>• CO<sub>2</sub> Footprint Reduction</li> <li>• Plastic Reduction</li> <li>• Animal Welfare</li> <li>• Children's Fund</li> </ul>	<ul style="list-style-type: none"> <li>• Fur-free products</li> <li>• Climate focus</li> <li>• Sustainable materials</li> <li>• Chemical Control</li> <li>• Animal Ethics</li> </ul>	<ul style="list-style-type: none"> <li>• Responsible role models</li> <li>• Sustainable materials</li> <li>• Aim to remove disposable plastic</li> <li>• Climate compensation for the company's transport</li> <li>• Reporting climate impact of products</li> </ul>

To make the information of Table 2.2 more understandable and representative of our study, we summarized the information relating to the delivery attributes in Table 2.2.

Table 2.2- Summary of logistics services provided by five Norwegian popular online stores in the fashion segment

Online		zalando.no	hm.com	xxl.no	nelly.com	ellos.no
Store	Logistics Service					
<b>Attributes</b>	Attribute Levels					
<b>Delivery Location</b>	Standard	✓	✓	✓	✓	✓
	Home delivery	✓	✓			✓
	In-store pick-up		✓	✓	✓	
<b>Delivery Speed</b>	Express		✓		✓	✓
	Standard	✓	✓	✓	✓	✓
<b>Delivery Cost</b>	Free (0 NOK)	✓	✓	✓	✓	✓
	1-50 NOK	✓	✓		✓	✓
	51-100 NOK	✓	✓	✓		✓
<b>Delivery Area</b>	Almost all areas in Norway	✓	✓	✓	✓	✓
<b>Delivery Days</b>	Working days	✓		✓	✓	✓
	7 days a week		✓			
<b>3PL Provider</b>	PostNord	✓		✓	✓	✓
	Bring		✓	✓		
	Helthjem		✓			
<b>Return Cost</b>	Free (0 NOK)	✓	✓	✓	✓	
	1-50 NOK		✓		✓	✓
	51-100 NOK			✓		
<b>Delivery Information</b>	SMS	✓		✓		✓
	e-mail	✓	✓		✓	✓



### 3.0 Methodology

In this chapter, we will describe the means and methods that are used to undertake our research. To come up with an appropriate and coherent research design, we will use a famous research “onion” model developed by (Saunders, Lewis and Thornhill 2019). We will describe different stages of our research in sequential order based on the layers of the onion starting from the outer layer (See Figure 3.1).

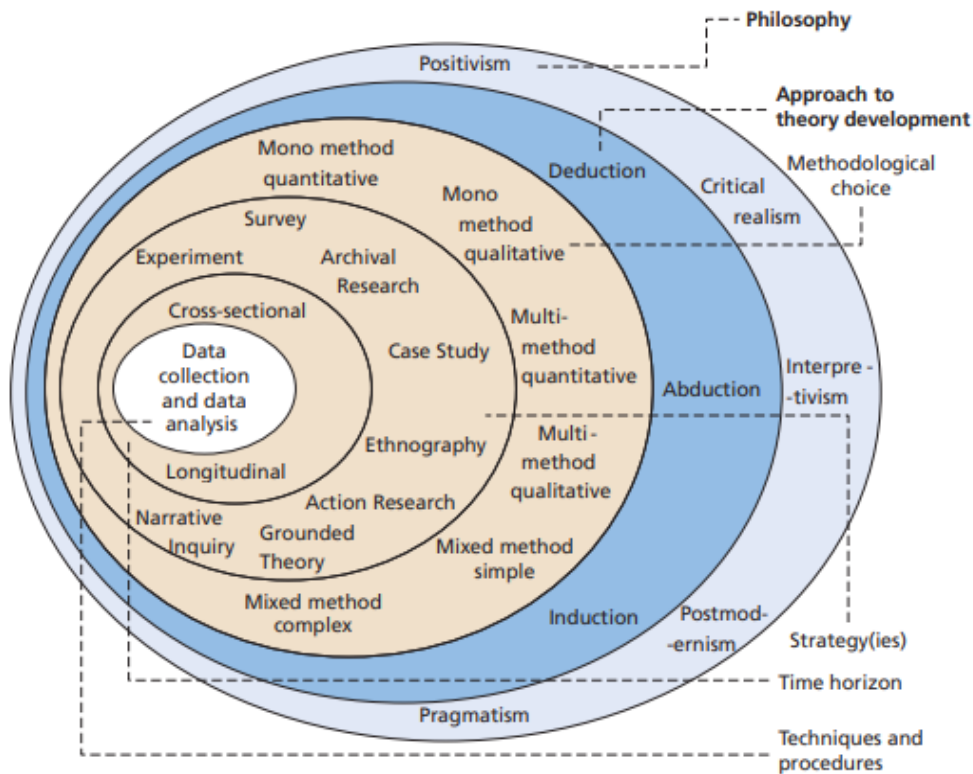


Figure 3.1 The research “onion” (Saunders, Lewis and Thornhill 2019, p. 130)

### 3.1 Research Philosophy

According to Saunders, Lewis and Thornhill (2019), research philosophy refers to developing knowledge in a particular field by combining researcher views and a set of beliefs regarding the investigated reality nature. The research philosophy plays a substantial role in understanding the research question, developing the research design and choosing a research strategy. As reported by Saunders and Tosey (2012), there are four major strategies relating to the business and management field: positivism, realism, interpretivism and pragmatism.

Characteristics of our research reflect the philosophy of positivism. This philosophical view is based on scientific knowledge where a researcher is interested in observing and predicting



outcomes and these outcomes are not influenced by the researcher's values. Moreover, a researcher uses structured and measurable data and involves large samples to undertake statistical research. In our research, we collected data by referring to the existing literature, statistical reports, and the websites of online stores operating in the fashion segment to identify preliminary attributes and levels required for our study. Afterward, we conducted a pilot study to test and confirm that identified preliminary attributes are realistic. Based on the confirmed attributes and their levels we developed the main questionnaire that was used to collect data for conducting a conjoint analysis. The outcomes of the analysis will be interpreted objectively.

### **3.2 Theory Development Approach**

Saunders, Lewis and Thornhill (2019) highlighted that researchers usually involve the theory in their research project. Furthermore, the theory used in the research design may and may not be explicit. However, in the presentation of the findings and conclusions, the theory usually is made explicit. The authors claim that there are three approaches to theory development: deductive, inductive and abductive.

According to Saunders, Lewis and Thornhill (2019), starting the research with theory developed from the reading of academic literature, and designing a research strategy to test a theory refers to a deductive approach. This approach description has the best match with our research. To understand consumer preferences when they purchase apparel products online, we searched academic literature and websites of the online retailers to define attributes and levels by assuming that delivery attributes will affect the consumers' purchasing decision. By developing an online questionnaire based on defined attributes and their levels, we asked the respondents to rate nine profiles generated by orthogonal design and will use primary data to show a relationship between delivery attributes and consumer preferences.

### **3.3 Methodological Choice**

To differentiate data collection and analysis methods, the quantitative and qualitative research methods are widely used in the business and management field. The quantitative method generally refers to the data collection and analysis methods and creates or uses numerical data while the qualitative method creates or uses non-numerical data (Saunders, Lewis and Thornhill 2007).

The researchers may choose to use these methods separately or a mixture of both as well as a single data collection method with a corresponding analysis procedure (Saunders and Tosey 2012). The authors distinguish six different designs: mono method quantitative, mono method qualitative, multimethod quantitative, multimethod qualitative, mixed-method simple design, mixed-method complex design. The quantitative method is widely used to collect primary data from a large number of respondents. Moreover, the data can be analyzed statistically or by using quantitative methods, and the results can be interpreted from the numbers (Saunders, Lewis and Thornhill 2007). Therefore, we can conclude that our study design is mono method quantitative because primary data is produced from the questionnaire which is a quantitative data collection technique, and the results can be analyzed statistically and by conducting quantitative analysis procedures.

### **3.4 Research Strategy**

The researchers can utilize a single strategy or multiple strategies within their research design to answer or address the research questions (Saunders and Tosey 2012). The choice of the research strategy depends on several factors, such as research objective or research questions, the extent of existing knowledge, the amount of time and other available resources (Saunders, Lewis and Thornhill 2007). Saunders and Tosey (2012) claim that particular research strategies can be associated with particular research philosophies but the boundaries between them are usually not exact. For instance, the survey and the experiment are generally associated with positivism but can be also utilized by realist and pragmatist researchers (Saunders, Lewis and Thornhill 2007). The objective of our thesis is to answer the research questions by implementing appropriate research strategies. Within this study, we implemented the experiment and survey strategies to address our research questions.

Saunders, Lewis and Thornhill (2007, refers to Hakim 2000) claim that the goal of the experiment is to analyze if a change in one independent variable will lead to a change in another dependent variable. Moreover, the simplest experiments analyze the links between two variables while more complex ones consider the amount of change and relative importance of independent variables. In our research, we conducted the simplest experiment in form of a pilot study and used the results to design the main questionnaire. In our study, we consider delivery attributes as independent variables and the consumers' preferences as the dependent variable.

According to Saunders, Lewis and Thornhill (2007), the survey is normally associated with the deductive approach. It is well-known in the business and management field and is often

used to respond to who, what, where, how much and how many questions in different contexts. By using a survey as a research strategy, the researchers obtain more control over the research process and can collect a large amount of quantitative data in a highly economical way. The surveys are also used to analyze the relationships between dependent and independent variables (Saunders, Lewis and Thornhill 2007). In our thesis, we will perform conjoint analysis which is a popular survey-based method. Therefore, the main research strategy in our study is survey and by rating the profiles generated through orthogonal design we can analyze the variables.

### **3.5 Time Horizon**

Saunders, Lewis and Thornhill (2007) define the time frame of the research as cross-sectional and longitudinal. Cross-sectional is a short-term study where the data collection process takes place at a specific point in time. In contrast, longitudinal studies take place over a long period of time and data may be collected repeatedly for comparing reasons. The authors claim that most academic research is time-constrained, hence cross-sectional. However, it can also be longitudinal based on the academic field as well as data collection and analysis time. In addition, the survey strategy is frequently employed in cross-sectional studies which is also the case in our research. We designed a questionnaire to analyze the consumer preferences on different delivery attributes within the online apparel industry.

### **3.6 Data Collection**

There are two major sources of data collection: primary and secondary (Kumar 2011; Sekaran 2003). The information gathered firsthand by the researcher on variables of the specific study refers to primary data whereas the information obtained from the existing literature sources refers to secondary data (Sekaran 2003). The author states that some examples of primary data sources are individuals, focus groups, etc. Moreover, the Internet is also considered a primary source when questionnaires are administered over it. Company records, governmental publications, websites (Sekaran 2003) as well as articles, journals, magazines, periodicals and books (Kumar 2011) that are used to acquire historical or other types of information are viewed as secondary sources.

#### **3.6.1 Primary Data Collection**

Several methods can be used to obtain primary data. The objective of the study, the researcher's skills as well as available resources impact the choice of a method. To select an

appropriate method for primary data collection it is necessary to take into consideration the socioeconomic-demographic characteristics of the study population and make the potential respondents understand the objective and relevance of the study. Understanding the purpose of the study is essential especially when the questionnaires are used to gather information (Kumar 2011). According to Saunders, Lewis and Thornhill (2007), the most popular method of primary data collection especially within the survey strategy is the questionnaire.

### ***Sample Selection***

The selection process of a sufficient number of elements from the population in such a way that the studied sample characteristics and properties represent similar characteristics and properties of population elements is defined as sampling (Sekaran 2003). Saunders, Lewis and Thornhill (2007), define sampling techniques as a range of methods that enable researchers to reduce the amount of data required to conduct research. The authors claim that when the population is of a manageable size, the primary data collection process can take place from an entire population. However, in several cases such as when it is impracticable to survey the entire population, when researchers face time and budget constraints, entire data is collected but quick results are needed, sampling can be a valid alternative to a population (Saunders, Lewis and Thornhill 2007; Sekaran 2003).

According to Saunders, Lewis and Thornhill (2007), there are two major types of sampling designs: probability (representative) sampling and non-probability (judgmental) sampling. The most frequently used probability and non-probability sampling methods are illustrated in Figure 3.2.

For probability samples, the elements have a known probability of being selected as sample subjects. In contrast, for non-probability samples, the probability of each element to be chosen from the total population is not known and researchers need to make statistical assumptions about the population characteristics (Saunders, Lewis and Thornhill 2007; Sekaran 2003). The authors claim that convenience sampling, as the name implies, refers to the haphazard selection of those population elements that are conveniently available to provide information. Convenience sampling is one of the best ways of obtaining information quickly and efficiently.

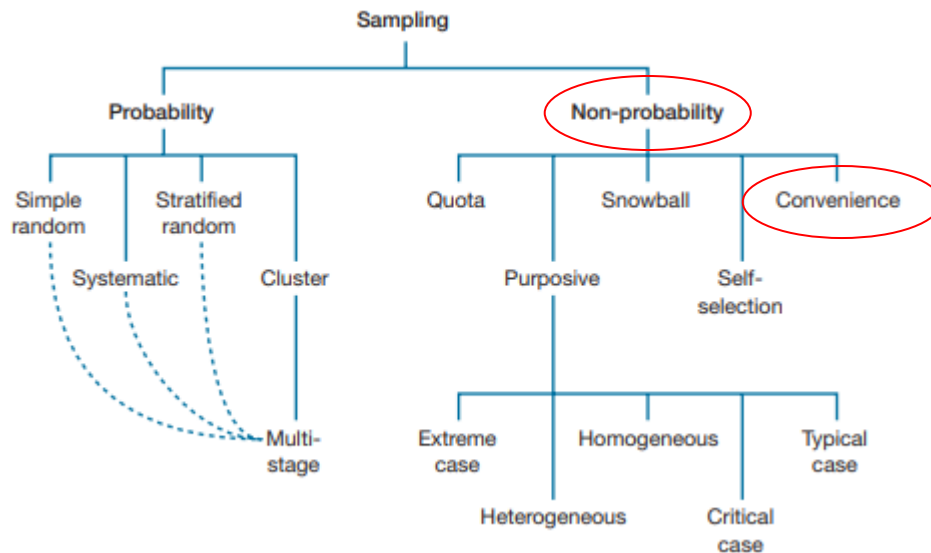


Figure 3.2 Sampling techniques (Saunders, Lewis and Thornhill 2007, p. 207)

For our study, we used the convenience sampling technique. Our study questionnaire is distributed among the respondents living in three Norwegian cities (Molde, Sarpsborg and Oslo). First of all, the respondents were asked the question of whether they buy apparel products online. In case of receiving a positive reply, and after mentioning our study objective, we provided our questionnaire link generated by Google Forms and asked them to fill it in. We sent the link of our online questionnaire to 126 participants and got 82 responses. Which means that the response rate of our survey is equal to approximately 65.1 %. Since we could gather 82 responses from our participants, we will consider our sample size to be equal to 82.

### ***Pilot study***

Pilot studies are small-scale studies that are conducted before the main study and intend to examine if the main study's important component will be appropriate and attainable. Pilot studies may be used for several purposes. For instance, it can be used to predict an appropriate sample size or for the improvement of different aspects of the study design (Saunders, Lewis and Thornhill 2007). According to Easterby-Smith, Thorpe and Jackson (2015), in the research design where qualitative and quantitative methods are used, there are two key considerations termed sequencing and dominance. Based on the combination of these choices three different design choices are identified that are called master-servant, partnership and compensatory designs. In a master-servant design, one method contributes to the requirement of the other. For example, within the main study which involves a questionnaire survey, the questionnaire survey is dominant, and the pilot study does not

affect the results of the study but serves as a helping tool for researchers to design the main questionnaire and obtain more accurate and reliable data (Easterby-Smith, Thorpe and Jackson 2015).

In our thesis, we use conjoint analysis to conduct our study which is a survey-based statistical technique. Therefore, a questionnaire survey is a dominant consideration, and we used a pilot study as a contributory tool to help us to design the main study questionnaire. The pilot study played a significant role in determining the attribute levels which were used to design the main questionnaire and conduct the conjoint analysis. We used Google Forms to generate our pilot study (See Appendix A) and used a convenience sampling technique to distribute the online questionnaire among respondents. Our main goal for conducting the pilot study was to examine the importance of different delivery attribute levels among consumers who buy apparel products online. The respondents had to select the delivery options which they would choose when order apparel products online. We received 24 responses for our pilot study.

### *Questionnaire*

According to Kumar (2011), Sekaran (2003), a questionnaire is a written set of questions that are formulated in advance, to which the respondents read, interpret and then record the answers. As stated by Sekaran (2003), when the researcher has an exact understanding of research requirements and variable measuring methods, the questionnaires can serve as an efficient data collection technique. As claimed by Saunders, Lewis and Thornhill (2007) within the survey strategy, the questionnaire is the most frequently used method of data collection in which each respondent is asked the same set of questions. The authors differentiated between two types of questionnaires: self-completed and interview completed. For our study, we used an electronically distributed and self-completed design of the questionnaire as an instrument of primary data collection. As claimed by Sekaran (2003), a researcher can benefit from using the electronic version of the questionnaire because it enables to cover a wide geographic area at a reasonable cost and the respondents can complete it at their convenience. However, the return rates are usually low and the response rate of 30% is considered acceptable. Our main study questionnaire is generated by using Google Forms which is a free survey administration software.

The questionnaire consisted of four sections where the first and the third sections contained instructions and a short introduction of a task to assist the participants to understand the survey. The second and the fourth sections contained the main parts of the questionnaire.

The second section consisted of questions related to the respondent's age, gender, level of education, work status and monthly income. The fourth section was the most important one for our study where we asked our respondents to rate 9 profiles containing logistics service attributes and levels on a 7-point Likert scale (1 represents very unlikely and 7 represents very likely).

### **3.6.2 Secondary Data Collection**

All previous research and data that have been obtained for some reasons and where the needed information is already available are termed secondary data (Saunders, Lewis and Thornhill 2007).

For our research the secondary data was obtained from the following sources: the academic journals, textbooks in physical and electronic version, research papers, conference proceeding, governmental and consulting company reports about e-commerce statistics, official statistics websites, online store websites as well as previous research reports relating to the consumer preferences in e-commerce specific to the fashion products and last-mile delivery options in Norway.

## **3.7 Data Analysis**

To discover useful information for business decision making it is important to inspect, clean, transform and model collected data. Without these processes, quantitative data in a raw form is very difficult to interpret and understand. By using graphs, charts and other quantitative analysis techniques, the researchers can examine and describe the relationships and trends within data (Saunders, Lewis and Thornhill 2007). For analyzing our data collected from the online questionnaire, we used IBM SPSS Statistics 23 statistical software, used for analyzing and understanding large and complex data sets, and performed conjoint analysis.

### **3.7.1 Conjoint Analysis**

Conjoint analysis (CA) is a well-known quantitative technique usually used in market analysis. The purpose of this technique is to evaluate how people assess distinct features characterizing an individual product or service. During CA, the respondents are asked to assess different profiles of a product/service rather to directly express their opinion about the feature of a product/service (Bodog and Florian 2012). CA depends on subjective evaluations of respondents (Malhotra, Nunan and Birks 2017). Each profile includes a set of product/service attributes with their levels and the researchers use these attributes and levels

to measure the purchasing interest of respondents (McCullough 2002). CA is meant to forecast the joint effect of independent variables set that measure product/service attributes on a dependent variable that measures consumer preferences (Bodog and Florian 2012). According to Steiner and Meißner (2018), Malhotra, Nunan and Birks (2017), the goal of CA is to measure how survey participants trade-off different alternatives and their specific attribute levels. As stated by Malhotra, Nunan and Birks (2017), CA aims at the development of part-worth or utility functions that will express the utility attached to each attribute's levels by consumers. The authors list six steps that are required to conduct CA (See Figure 3.4).

Steiner and Meißner (2018) describe three types of preference measurement approaches: compositional, decompositional and hybrid (See Figure 3.3). The authors claim that decompositional approaches, such as CA are used more frequently and during the analysis, the researchers ask participants to assess multi-attribute alternatives and use these assessments to estimate attribute levels' part-worth utilities. Traditional CA and Choice-Based CA (CBC) are widely used conjoint analytic approaches.

Compositional approaches	Hybrid approaches	Decompositional approaches
<ul style="list-style-type: none"> <li>■ Self-explicated approaches:               <ul style="list-style-type: none"> <li>- Direct rating</li> <li>- Unweighted self-explicated approach</li> <li>- Weighted self-explicated approach</li> <li>- Conjunctive compensatory self-explicated approach</li> <li>- Adaptive Self-Explicated approach and its extension, pre-sorted self-explicated approach</li> </ul> </li> <li>■ Analytic Hierarchy Process and its adaptation for preference measurement</li> <li>■ Max-Diff Scaling / Best-Worst Scaling</li> <li>■ Restricted-Click-Stream analysis</li> </ul>	<ul style="list-style-type: none"> <li>■ Traditional Hybrid Conjoint Analysis</li> <li>■ Sawtooth Software Adaptive Conjoint Analysis (ACA)</li> <li>■ Sawtooth Software Adaptive Choice-Based Conjoint Analysis (ACBC)</li> </ul>	<ul style="list-style-type: none"> <li>■ Traditional Conjoint Analysis (full-profile approaches vs. trade-off matrices; simultaneous presentation of all product concepts vs. paired-comparisons)</li> <li>■ Choice-Based Conjoint analysis (CBC)</li> </ul>

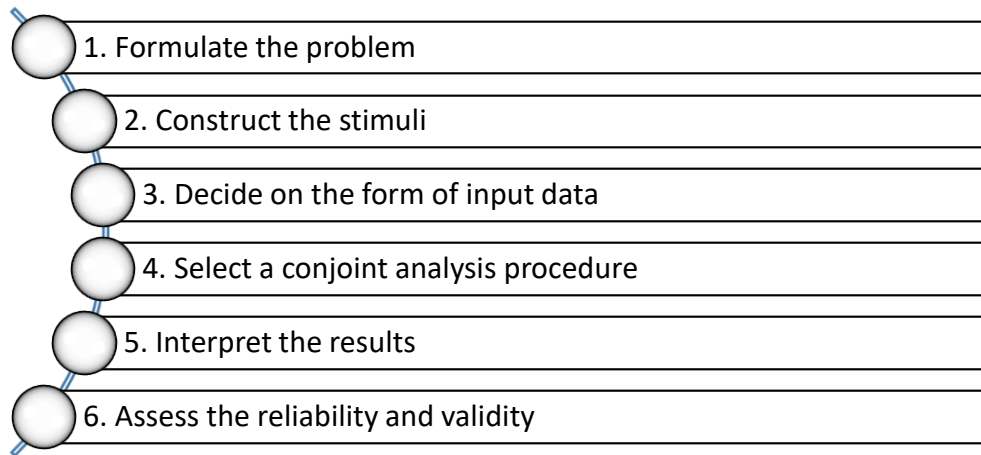
*Figure 3.3 Compositional, decompositional and hybrid preference measurement approaches (Steiner and Meißner 2018, p.7)*

CA is divided into three branches: ratings-based conjoint, choice-based conjoint, and hybrid techniques. To begin CA, researchers need to choose an appropriate technique for their study. Within a choice-based conjoint, the respondents are offered series of choices and asked to select any of the alternatives whereas, in a rating-based conjoint, the respondents must rate the alternatives. Hybrid techniques combine self-explicated scaling with one of the other conjoint techniques and usually are used when the study should be performed with a large number of attributes (McCullough 2002).

According to Malhotra, Nunan and Birks (2017) for conducting a CA, the researchers must follow a six-step process (See Figure 3.4). In the first step, the researchers need to identify



salient attributes and their levels. The second step involves the construction of stimuli based on the first step's identified attributes and their levels. By using a suitable scale, the respondents are asked to rate or rank the stimuli. Afterward, data is collected, analyzed and interpreted. The final step is an assessment of data reliability and validity. In the following subheadings, we will describe each step of CA in detail.



*Figure 3.4 Conjoint analysis steps*

### ***Formulate the problem***

According to Malhotra, Nunan and Birks (2017), a conjoint analysis problem is formulated when the researchers identify attributes and levels for constructing the stimuli. Moreover, selected attributes should be salient in influencing the preference and choice of a consumer. Following the attribute selection, the researchers should determine their appropriate levels which denote the values assumed by the attributes and influence stimuli numbers that should be evaluated. The authors claim that it is desirable to have a small number of attribute levels to minimize the respondent's evaluation task and at the same time to get reasonable accuracy in the estimation of parameters.

For defining the attributes and levels for our study, we searched the existing literature, the five online store websites selling apparel products, and conducted a pilot study. As a result, we identified four attributes and selected their raw levels. Afterward, we examined the raw levels of attributes and identified the final attribute levels which we used to construct the stimuli. The attributes and their levels that are used for our study are presented in Table 3.1.

*Table 3.1 Attributes and their levels*

<b>Attributes</b>	<b>Attribute Levels</b>
Delivery Location	<ul style="list-style-type: none"> <li>○ Standard (Mailbox)</li> <li>○ Home delivery</li> <li>○ Pick-up point</li> </ul>
Delivery Speed	<ul style="list-style-type: none"> <li>○ Express (1-2 working days)</li> <li>○ Standard (3-7 days)</li> </ul>
Delivery Cost	<ul style="list-style-type: none"> <li>○ Free (0 NOK)</li> <li>○ 1-50 NOK</li> <li>○ 51-100 NOK</li> </ul>
Return Cost	<ul style="list-style-type: none"> <li>○ Free (0 NOK)</li> <li>○ 1-50 NOK</li> <li>○ 51-100 NOK</li> </ul>

***Construct the stimuli***

According to Malhotra, Nunan and Birks (2017), for the construction of CA stimuli, two broad approaches are used: the pairwise approach and the full-profile approach. In the pairwise approach (two-factor evaluations) the respondents assess two attributes at a time until the full assessment of all the possible attribute pairs. Whereas, in the full profile approach (multi-factor evaluations), complete profiles are generated for all attributes, and each profile is depicted on a separate index card. For our study, we used traditional conjoint analysis with a full-profile approach. McCullough (2002) states that full-profile tasks include one level from every attribute and ideally full-profile studies should contain less than six attributes. Moreover, in case of extremely complex and unfamiliar attributes, even six is overabundant. Steiner and Meißner (2018) point out that choosing between two and five levels for each attribute is advisable. As claimed by (Hurtado and Manuel 2010), the main advantage of the full-profile method is that it allows getting a more realistic vision of the analyzed problem because the product's/service's attribute features are dealt with together. As a drawback of this method, the authors mention the possibility of information overload in case of having a large number of attributes and/or levels. To avoid such a problem and reduce the evaluation task of the respondents, a fractional factorial design should be employed (Malhotra, Nunan and Birks 2017).

During the first step of CA, we identified four attributes: three of them with three levels and one with two levels. Therefore, given the number of attributes and their levels, the total number of constructed profiles will be  $3 \times 3 \times 3 \times 2 = 54$ . Having a total of 54 profiles and asking the participants to evaluate may be overwhelming. Therefore, to reduce our respondent's evaluation tasks, we employed a fractional factorial design. A special class of fractional design named orthogonal array is used to reduce the number of stimulus profiles to be evaluated in a full-profile approach. Orthogonal arrays allow the efficient estimation of all main effects of interest on an uncorrelated basis. It assumes that all interactions present in stimuli are negligible (Malhotra, Nunan and Birks 2017, p.780). To construct the estimation stimuli set, we used IBM SPSS Statistics 23 and a set of 9 profiles were generated via an orthogonal design and were converted into cards (See Table 3.2).

*Table 3.2 Estimation set consisting of 9 stimuli*

<b>Card List</b>					
	Card ID	Delivery Location	Delivery Speed	Delivery Cost	Return Cost
1	1	Pick-up Point	Express (1-2 working days)	Free (0 NOK)	1-50 NOK
2	2	Home	Standard (3-7 working days)	Free (0 NOK)	51-100 NOK
3	3	Home	Express (1-2 working days)	51-100 NOK	1-50 NOK
4	4	Mailbox	Express (1-2 working days)	51-100 NOK	51-100 NOK
5	5	Pick-up Point	Express (1-2 working days)	1-50 NOK	51-100 NOK
6	6	Mailbox	Standard (3-7 working days)	1-50 NOK	1-50 NOK
7	7	Mailbox	Express (1-2 working days)	Free (0 NOK)	Free (0 NOK)
8	8	Home	Express (1-2 working days)	1-50 NOK	Free (0 NOK)
9	9	Pick-up Point	Standard (3-7 working days)	51-100 NOK	Free (0 NOK)

Nine separate design cards resulted from the 9 profiles should be presented to the respondents for evaluation. An example of a profile card is illustrated in Table 3.3 (Find the illustration of 9 profile cards in Appendix B).

Table 3.3 Profile example for collecting conjoint data in the full-profile approach





Delivery Location	Delivery Speed	Delivery Cost	Return Cost
Pick-up Point	Express (1-2 working days)	Free (0 NOK)	1-50 NOK

**Decide on the form of input data**

The form of input data in CA can be either metric or non-metric. In the non-metric data, the respondents are asked to provide rank order assessments, whereas, for metric data, the respondents provide a rating (Malhotra, Nunan and Birks 2017). The authors claim that the rating method is more convenient for respondents than ranking. The dependent variable in CA is usually consumer preference and the participants provide ranking or rating based on their preference.

In our study, the participants were asked to provide ratings for the logistics services described by the nine profiles in the estimation set. The consumers’ ratings were obtained by using a 7-point Likert scale (1=very unlikely and 7= very likely). An example of a logistics service profile designed for the questionnaire is demonstrated in Figure 3.5 and the full questionnaire illustration can be found in Appendix C.

How likely is it that you would choose the following option when you buy apparel products online?  
(1= very unlikely and 7= very likely)

 <b>Mailbox Delivery</b>	 <b>Delivery Speed: Express (1-2 working days)</b>
 <b>Delivery Cost: Free (0 NOK)</b>	 <b>Return Cost: Free (0 NOK)</b>

1   2   3   4   5   6   7

Very Unlikely                        Very likely

Figure 3.5 Example of a profile designed for questionnaire

**Select a conjoint analysis procedure**

According to Malhotra, Nunan and Birks (2017, p.781), the basic mathematical model expressing the fundamental relationship between attributes and utility in CA (conjoint analysis model) may be represented by the following formula:

$$U(X) = \beta_0 + \sum_{i=1}^m \sum_{j=1}^{k_i} \alpha_{ij} x_{ij} \quad (1)$$

Where  $U(X)$  = overall utility of an alternative

$\beta_0$  = is an intercept

$\alpha_{ij}$  = the part-worth contribution or utility associated with the  $j$ th level ( $j = 1, 2, \dots, k_j$ ) of the  $i$ th attribute ( $i = 1, 2, \dots, m$ )

$k_i$  = number of levels of attribute  $i$

$m$  = number of attributes

$x_{ij} = 1$  if the  $j$ th level of the  $i$ th attribute is present = 0 otherwise.

The importance of the attribute,  $I_i$ , is defined in terms of the range of the part-worths,  $\alpha_{ij}$ , across the levels of that attribute:

$$I_j = \{ \max(\alpha_{ij}) - \min(\alpha_{ij}) \} \text{ for each } i$$

To calculate the relative importance of the attributes,  $W_i$ , the following formula is used:

$$W_i = \frac{I_i}{\sum_{i=1}^m I_i} \quad (2)$$

so that

$$\sum_{i=1}^m W_i = 1 \quad (3)$$

According to Malhotra, Nunan and Birks (2017, p.782), for estimating the basic model, there are several different procedures available, the simplest of which gaining popularity is dummy variable regression. The predictor variables consist of dummy variables for the attribute levels and if an attribute has  $k_i$  levels, it is coded in terms of  $k_i - 1$  dummy variables (Malhotra, Nunan and Birks 2017, p.782). For our study we used ordinary least squares (OLS) regression to estimate the relationships between independent variables and a dependent variable. We asked our respondents to rate the profiles in a 7-point Likert scale and these obtained ratings form the dependent variable. The ratings were used to estimate the part-worth utilities. Our study model may be represented by the following formula:

$$U(X) = \beta_0 + \sum_{j=1}^3 \alpha_{1j} x_{1j} + \sum_{j=1}^2 \alpha_{2j} x_{2j} + \sum_{j=1}^3 \alpha_{3j} x_{3j} + \sum_{j=1}^3 \alpha_{4j} x_{4j} \quad (4)$$

Where  $\beta_0$  is an intercept of the model,  $\alpha_{1j}, \alpha_{2j}, \alpha_{3j}, \alpha_{4j}$  are the utilities associated with the attribute levels with 1=delivery location, 2=delivery speed, 3=delivery cost and 4=return cost with  $x_{1j}, x_{2j}, x_{3j}, x_{4j}$  are dummy variables for the attribute levels.

### ***Interpret the results***

To interpret the results for conjoint analysis it is necessary to process obtained data via SPSS. As claimed by Malhotra, Nunan and Birks (2017), for interpreting the results and making it more understandable the part-worth function values for each attribute should be plotted. From the plotted part-worth functions, the greatest preferences of participants for delivery options when they make an online purchase of apparel products would be more understandable.

### ***Assess the reliability and validity***

According to Malhotra, Nunan and Birks (2017), several procedures can be implemented to evaluate the reliability and validity of the conjoint analysis. As claimed by the authors, it is necessary to assess the goodness of fit of the estimated model. For instance, in the case of dummy variable regression, the value of  $R^2$  will show the extent to which the model fits the data. In our case, to assess the goodness of fit of the estimated conjoint model, we need to look at the value of Kendall's tau, Pearson's R and the value of adjusted  $R^2$ . The objective of finding these values is to make sure how consistently the model estimates the set of preference evaluations under different situations.

## **3.8 Validity and Reliability of a Research Instrument**

The goal of a research instrument (questionnaire) in research is to gather relevant information in the most valid and reliable way. Therefore, the questionnaire's accuracy and consistency make up a significant aspect of research methodology and are named as validity and reliability (Taherdoost 2016).

### **3.8.1 Validity**

Within any type of research process, the concept of validity can be applied. Regarding measurement procedures, it identifies whether the research instrument is measuring what is intended to measure (Kumar 2011). The author claims that two approaches are employed to establish instrument validity in quantitative research. The first approach relates to the formation of a logical link among the study objectives and the questions included in the questionnaire. The second approach relates to the implementation of the statistical analysis to illustrate the links between the study objectives and questions. Taherdoost (2016) distinguishes four different validity types within the quantitative research: face validity, content validity, construct validity and criterion validity.

### ***Face validity***

According to Taherdoost (2016), the extent to which a measure seems to be related to a specific construct based on the test taker's judgment defines face validity. In other words, if the content of the research instrument looks relevant to the test taker considering its feasibility, readability, style consistency and formatting as well as used language clarity, then it is assumed that the instrument has face validity. We conducted a pilot study to check face validity and make sure that the research instrument looks relevant to test takers.

### ***Content validity***

The degree to which statements or questions in the instrument refer to the objective they intend to measure judged by a researcher or field expert refers to content validity (Kumar 2011). Including all essential items and eliminating undesirable ones in a survey instrument is fundamental to ensure content validity. Literature reviews and later follow-ups with expert evaluation are used to establish content validity (Taherdoost 2016). We constructed our research instrument (questionnaire) to measure the preferences of online shoppers for logistics services when they buy apparel products online. Therefore, we designed a questionnaire with delivery attributes and respective attribute levels that are considered important and represent the current market situation.

### ***Construct validity***

Construct validity refers to how well a researcher translated or transformed a construct (concept, idea or behavior) into operating reality (Taherdoost 2016). This is a more advanced technique for establishing the instrument's validity and is based on statistical procedures (Kumar 2011). To find out consumer preferences of logistics services we used delivery attributes which we thought are the most important ones with their levels to conduct conjoint analysis. After the analysis statistical procedures are used to establish the contribution of each attribute to consumer preferences. The contribution of delivery attributes is an illustration of the instrument's validity.

### ***Criterion validity***

A degree to which a measure is related to an outcome is referred as criterion validity. It determines how well an outcome of one measure is predicted by another measure. The research instrument will have this type of validity if it is effective to predict another situation's performance (past, present or future) (Taherdoost 2016). As claimed by Kumar

(2011), a criterion is another instrument that measures the same variable, and this validity can be expressed in terms of the correlation coefficient among the criterion and predicted status. For instance, predicting the market share of the logistics service profiles via utility model by creating the stimulation cards, the validity of conjoint analysis is checked.

### **3.8.2 Reliability**

According to Taherdoost (2016), Kumar (2011), the degree to which a research instrument provides stable and consistent result refers to reliability. The authors also claim that repeatability refers to reliability. For instance, when a researcher obtains the same information set under constant conditions and gets similar results, a research instrument appears to be reliable.

In the opinion of Taherdoost (2016), the Cronbach Alpha coefficient is the most widely used internal consistency measure. Moreover, when within the research instrument Likert scales are used, Cronbach's Alpha is viewed as the most relevant measure of reliability. As reported by Sekaran (2003) for checking the reliability of measures, the Cronbach's alpha reliability coefficients are obtained for dependent and independent variables. The closer the value of Cronbach's alpha (reliability coefficient) gets to 1, the better. There are no absolute rules for estimating the reliability, but most researchers agree that reliabilities higher than 0.8 are considered to be good, in the 0.7 range as acceptable and less than 0.6 are considered to be poor. The values of Pearson's R and Kendall's tau being close to 1 indicates a correlation between the observed and estimated values, whereas the values being close to zero indicates a low correlation. According to our analysis performed by SPSS, the results of overall statistics showed that the value of Pearson's R was 1.000 and Kendall's tau was 0.944 (See Appendix D). These values show that there is a correlation between the observed and estimated data and the model is well-fitting.



## 4.0 Empirical Findings

In this section, we will present the most important empirical findings related to our study questions. We will divide this section into two different parts. In the first part of this section, we will introduce the empirical findings of the pilot study conducted to check the relevance of attributes identified from the literature review. In the second part of this section, the results of the main study obtained from the questionnaire will be presented.

### 4.1 Pilot Study

The pilot studies are usually used to test the reliability of the research instrument (questionnaire) and the validity of the questions included in the questionnaire. We conducted a pilot study to confirm the relevance of the attributes and attribute levels obtained from the literature review and make sure that they are representative of the current market situation. Based on the results of the pilot study we selected the final attributes and their levels which we used to design the main study questionnaire. We obtained 24 responses for our pilot study. The results of the pilot study are presented in Figure 4.1-4.4. The criteria that we used to determine the final attributes for the main study questionnaire were based on the level of preference from our pilot study participants. For instance, we selected the options that received more than 10% preference from our participants. We assumed that less than 10% means that the option is not desirable by the respondents.

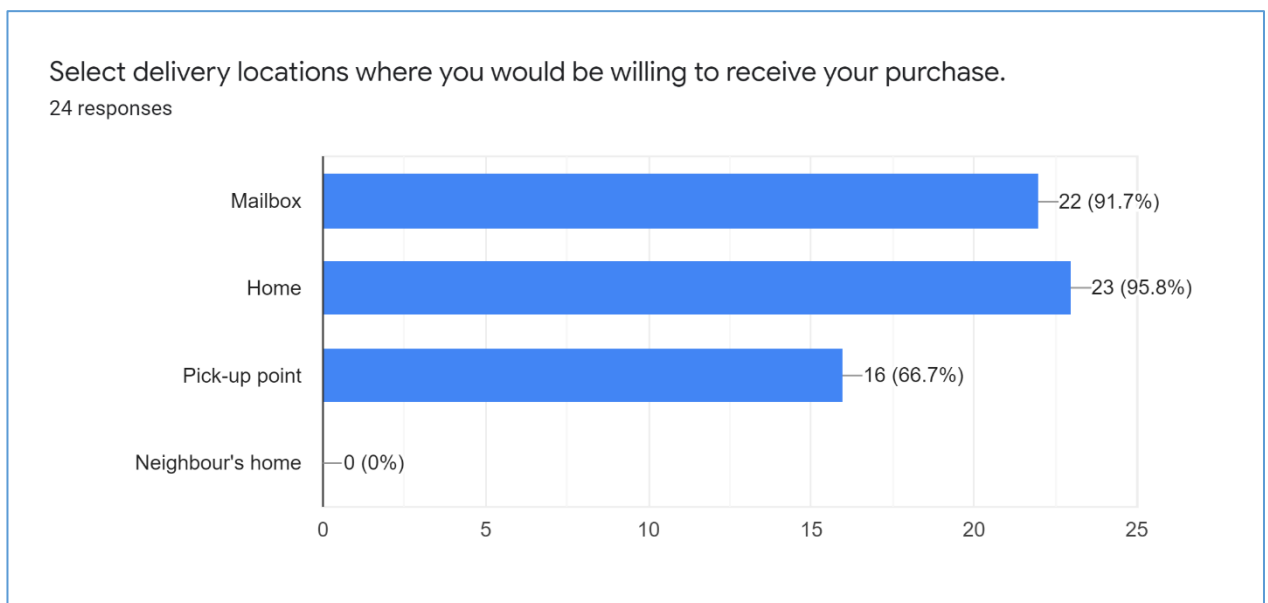
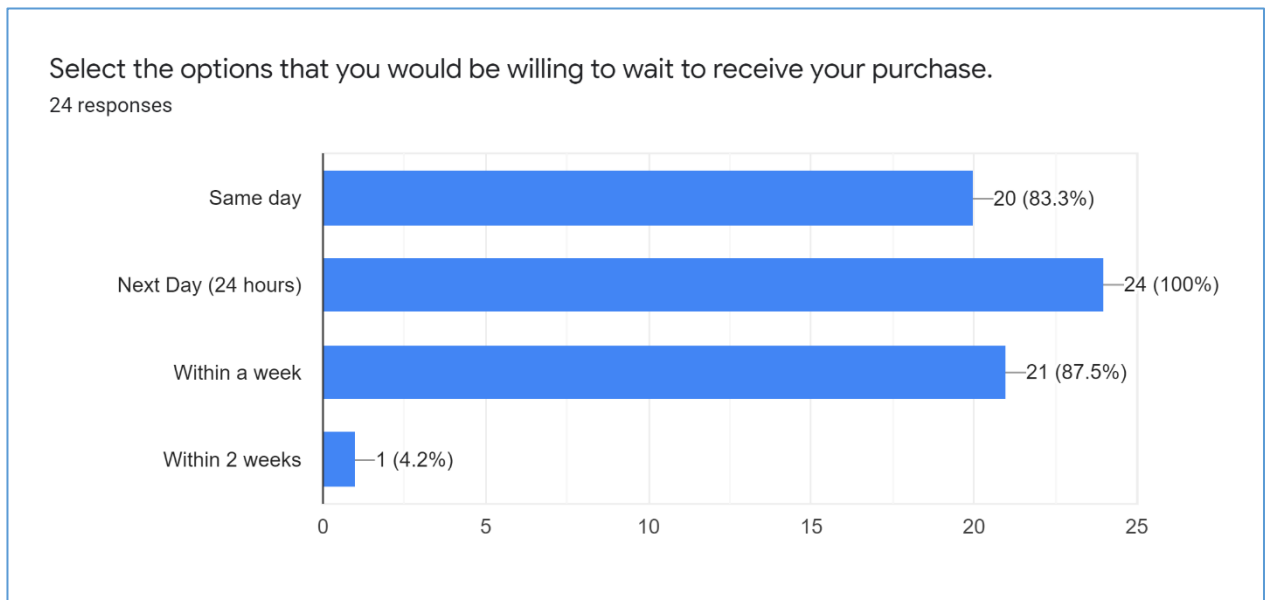


Figure 4.1 Delivery location

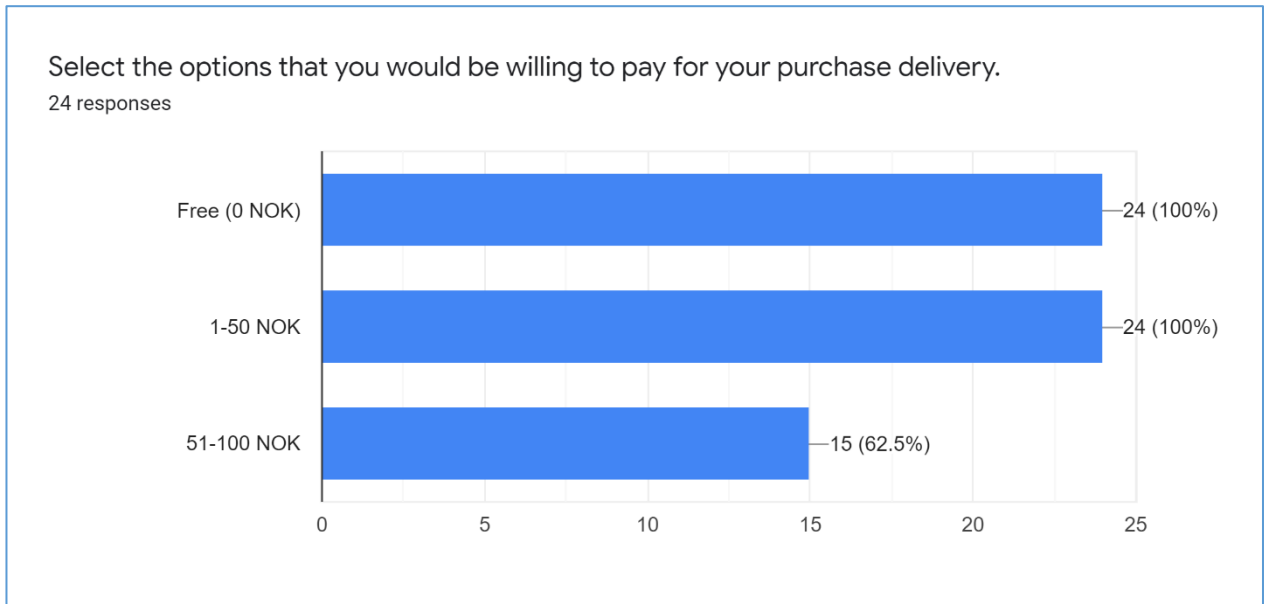
From the literature review and the analysis of the websites of the five most popular online stores operating in the fashion segment, we identified four levels for delivery location attribute: mailbox, home, pick-up point and neighbor's home. However, the results of the pilot study illustrate that nobody from the surveyed persons chose a neighbor's home as a preferred delivery location (See Figure 4.1). Therefore, we eliminated this option and included three levels for delivery location in our main questionnaire.

For the delivery speed attribute, we identified four levels based on the literature review: same day, next day, within a week and within two weeks. However, the analysis of the online stores' websites showed that the express delivery offered by shops takes 1-2 working days. Therefore, we decided to combine the same-day delivery and next-day delivery attribute levels and include express delivery (1-2 working days) as one of the delivery speed levels.



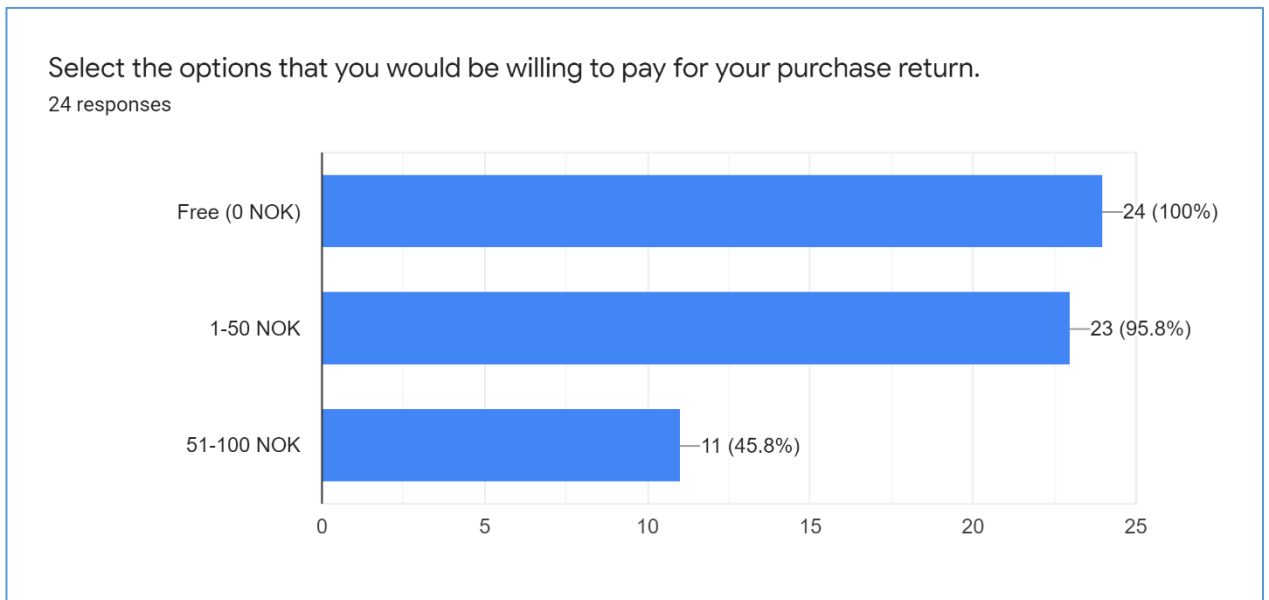
*Figure 4.2 Delivery Speed*

The results of the pilot study illustrate that one of the delivery speed attribute levels (within 2 weeks) was chosen by only 4.2% of our respondents (See Figure 4.2). Therefore, we did not include it in the main questionnaire.



*Figure 4.3 Delivery Cost*

The pilot study results for delivery cost show that three levels identified by the literature review and the analysis of the online shops' websites received high values (See Figure 4.3). As a result, we decided to use all three delivery cost levels in the main study although delivery fees may vary based on the online retailer's strategy. Interestingly, free delivery and delivery cost of 1-50 NOK were selected by 100% of the respondents. We can assume that the consumers do not mind paying up to 50 NOK for delivery because this level was equally preferable to free delivery.



*Figure 4.4 Return Cost*

Since the identified levels for return cost were chosen by many of the respondents (see Figure 4.4), we decided to include these three levels in our main study questionnaire. Not

surprising that the most favorite option chosen by all participants for the return cost was the free return.

In conclusion, based on the results of our pilot study and the literature review we chose three levels for delivery location, two levels for delivery speed, three levels for delivery cost and three levels for the return cost. These four attributes and their levels were used to create nine cards and these cards were included in the main study questionnaire to be evaluated by the survey participants.

## 4.2 Questionnaire Survey

For conducting the conjoint analysis, we obtained data from the online questionnaire created in Google Forms survey administration software. By sharing the link of the questionnaire (<https://forms.gle/AY3Rf1cbi66jM61i7>) among the respondents, we could gather 82 responses in total which represents our sample size. Among the survey participants, 52 (63.4%) were males and 30 (36.6%) were females from six age categories (see Appendix E). The participants in the “25-34 years old” and “35-44 years old” age categories represent a large proportion amounting to 39% and 34.1%, respectively. Moreover, the respondents who have the education level of master’s degree and higher, form 41% and those who possess bachelor’s degree form 35.4% of our respondents. A large proportion of our respondents are employed persons (65.9%) followed by students (32.9%). More than one third of our respondents (30.5%) have less than 20 000 NOK monthly income. This is followed by two groups of respondents with 20 000 – 34 999 NOK and 35 000 – 49 999 NOK monthly income representing 19.5 % each. No income group has the lowest number of respondents with 6.1%.

In one of the parts of our online questionnaire, we asked our respondents to rate nine profile cards where four delivery attributes were present. The respondents were asked “*How likely is it that you would choose the following option when you buy apparel products online?*” question and had to rate the nine cards displayed to them on a 7-point Likert scale (1= very unlikely and 7= very likely). The number and percentage of respondents’ ratings of the nine cards are presented in the form of a separate bar chart for each card (see Figure 4.5-4.13).

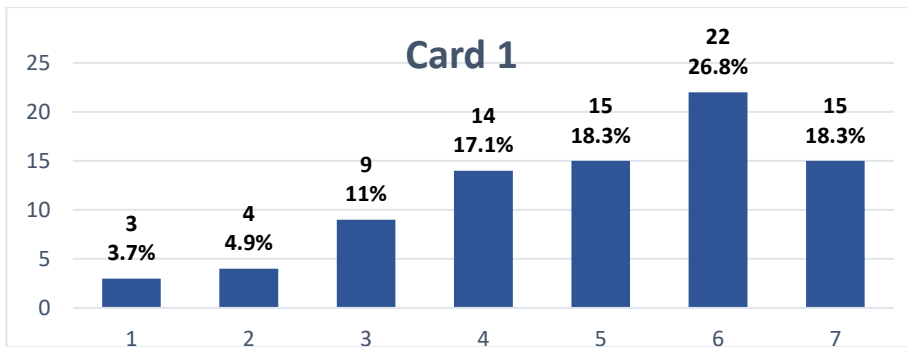


Figure 4.5 Results of Card 1

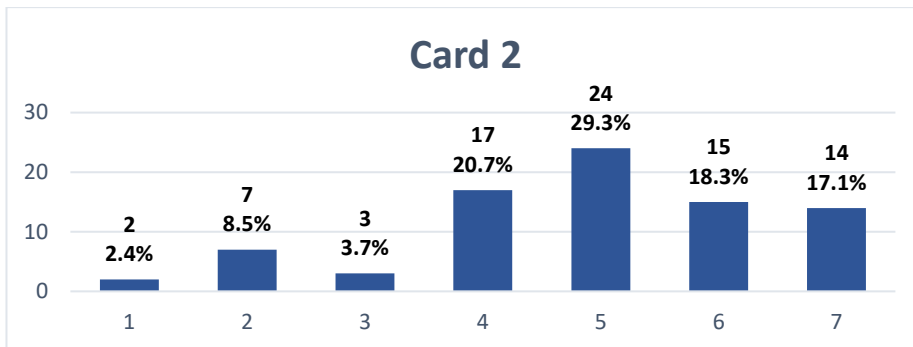


Figure 4.6 Results of Card 2

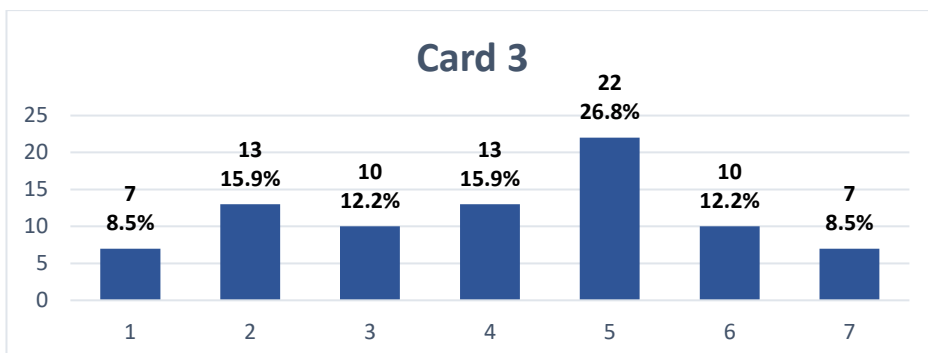


Figure 4.7 Results of Card 3

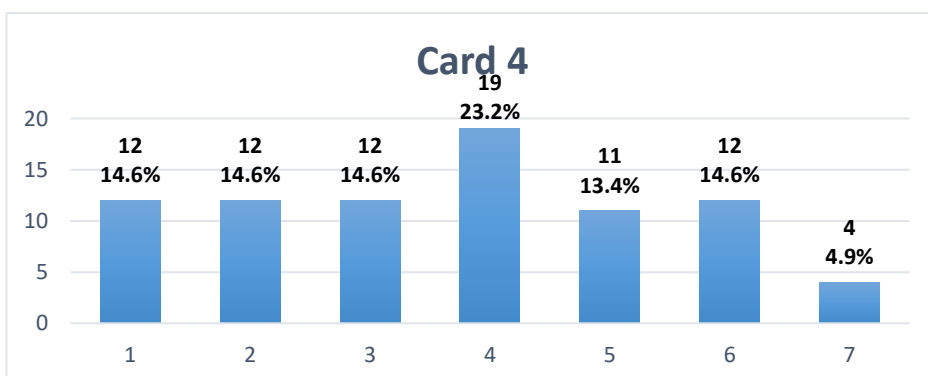


Figure 4.8 Results of Card 4

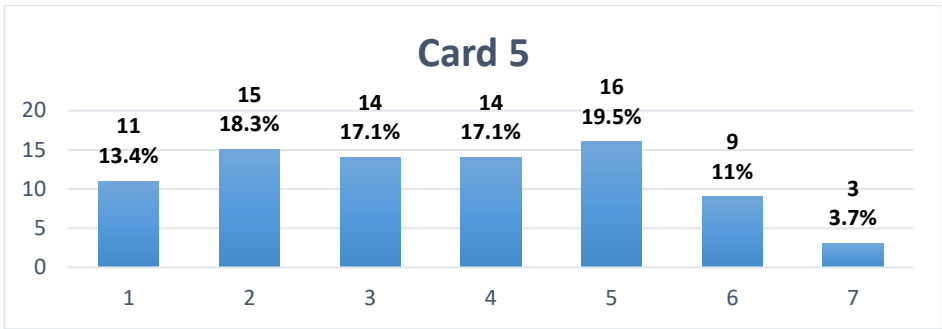


Figure 4.9 Results of Card 5

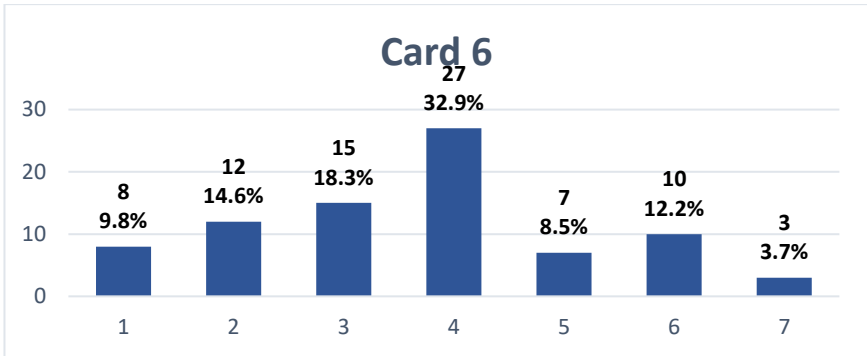


Figure 4.10 Results of Card 6

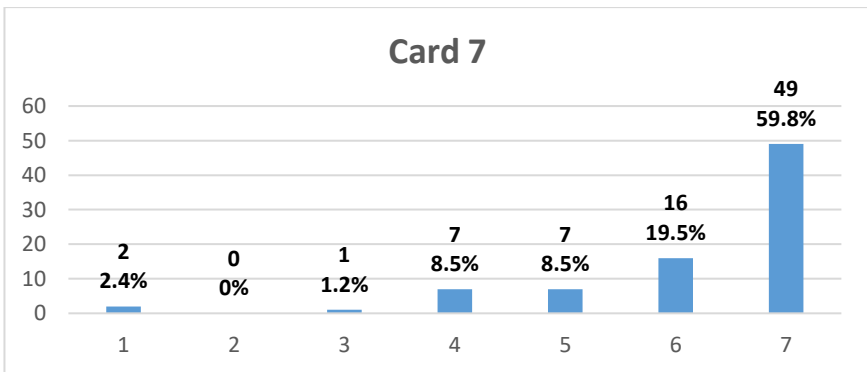


Figure 4.11 Results of Card 7

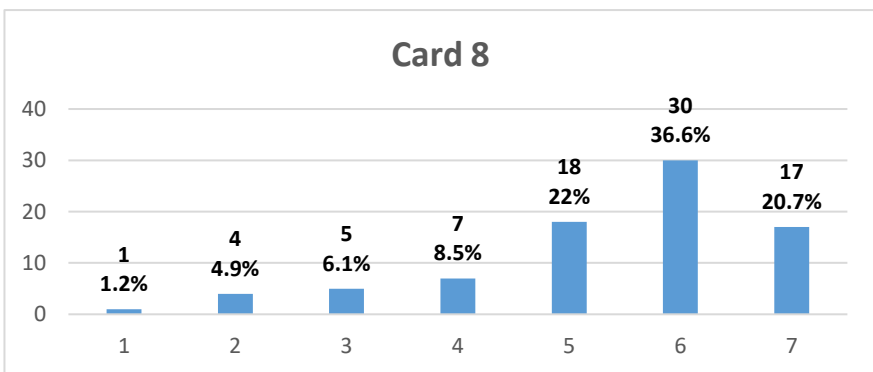
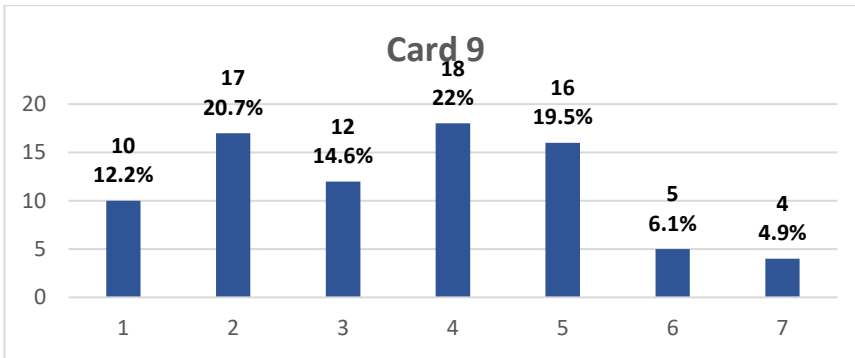


Figure 4.12 Results of Card 8



*Figure 4.13 Results of Card 9*

## 5.0 Analysis

In this chapter, we will present the results of the conjoint analysis performed in SPSS Version 23. This chapter will be divided into two main parts. In the first part, we will display the overall statistics results obtained after conducting the CA. In the second part, we will analyze and describe the results for each logistics service profile and each attribute and level separately. Moreover, the analysis of attributes based on the socio-economic variables will be displayed in this part as well. This part will end up with simulation analysis to predict the preferences of logistics service profiles that were not included within the nine profiles generated by the orthogonal design and were not rated by the respondents. The CA in SPSS is implemented with syntaxes (see Appendix G).

### 5.1 Statistical Results

#### 5.1.1 Importance values

The range of the utility values for individual factors measures to which extend the factor was important for overall preference. Factors having greater utility ranges have a more substantial role than the ones with smaller ranges (Malhotra, Nunan and Birks 2017). The measure of relative importance is called an importance score or value. By taking each factor's utility range separately and dividing by the sum of all factors' utility ranges, the importance scores are calculated. These scores represent percentages and have the feature that they sum to 100. The results of the relative importance values obtained from SPSS analysis for our study are presented in Table 5.1 below.

*Table 5.1 Importance values*

<b>Importance Values</b>	
Location	25.075
Speed	14.373
Delivery_Cost	32.662
Return_Cost	27.889

Averaged Importance  
Score

The results presented in Table 5.1 show that for the respondents of our study delivery cost with a percentage of 32.662 is the most important factor when they choose logistics services of apparel products. The second important factor is return cost with a percentage of 27.889



followed by delivery location with a percentage of 25.075. The delivery speed with a percentage of 14.373 has the lowest importance score. Although delivery speed is the least influential factor compared to the other three factors, its impact on the respondents' overall preferences is still considerable.

### 5.1.2 Utility values

The goal of the CA is to develop part-worth or utility functions that will disclose the utilities attached to each attribute's levels by consumers. A higher utility value means a greater preference for the attribute level (Malhotra, Nunan and Birks 2017). According to Orme (2002) within each attribute, conjoint utilities are scaled to an arbitrary additive constant and are interval data which means that simple operations of subtraction and addition are allowed. The arbitrary nature of the scaling within each attribute is a consequence of dummy coding in the design matrix, and the part-worth (utilities) are scaled to sum to "zero" within each attribute. Malhotra, Nunan and Birks (2017) claim that the value of each part-worth (utility) should be compared within its own attribute and not with the utility level from another attribute.

Table 5.2 shows the utility values for each attribute level obtained from SPSS analysis. From Table 5.2 is visible that utility estimates received positive and negative values because the utilities are scaled to sum to zero within each attribute.

*Table 5.2 Utilities*

		Utilities	
		Utility Estimate	Std. Error
Location	Mailbox	.078	.036
	Home	.349	.036
	Pick-up point	-.426	.036
Speed	Express (1-2 working days)	.314	.027
	Standard (3-7 working days)	-.314	.027
Delivery_Cost	Free (0 NOK)	.924	.036
	1-50 NOK	-.235	.036
	51-100 NOK	-.689	.036
Return_Cost	Free (0 NOK)	.607	.036
	1-50 NOK	-.214	.036
	51-100 NOK	-.393	.036
(Constant)		4.272	.027

The results of Table 5.2 illustrate that for the first attribute which is delivery location, the home delivery with a positive utility value of 0.349 is the most preferred attribute level for our respondents followed by the mailbox with a 0.078 utility value. The pick-up point is the least preferred attribute level among our respondents with a negative value of -0.426. The negative utility value does not mean that this attribute level is not preferable at all because many respondents can choose pick-up points as a delivery location. However, all other factors remain constant, home delivery is the most preferred delivery location for our respondents. Similarly, express delivery (1-2 working days) with a positive utility value of 0.314 is more preferred among our study participants than standard (3-7 working days), which means that the respondents choose to have their apparel products delivered fast. Table 5.2 also shows that free delivery (0 NOK) with a high positive value of 0.924 is strongly preferred by our survey participants. This is followed by a delivery cost level of 1-50 NOK with a negative utility value of -0.235 which means that some of our participants will accept to pay 1-50 NOK for the delivery of their products. The least preferred level for delivery cost attribute is 51-100 NOK with a lower negative utility value of -0.689. We got similar to the delivery cost attribute results for our fourth attribute (return cost). Free (0 NOK) return of products is the most favored option among the return cost levels with a high positive part-worth of 0.607. This is followed by 1-50 NOK and 51-100 NOK return cost levels with negative utility values of -0.214 and -0.393, respectively.

### 5.1.3 Total utility

Total utility is the aggregated utility and based on formula (4) we can calculate total utility for each profile. The total utilities of the profiles can be calculated based on the obtained utility values of attribute levels. Based on the formula (4), the following formula can be used to calculate the total utilities of each profile:

$$U(x) = \beta_0 + \alpha_{1j}x_{1j} + \alpha_{2j}x_{2j} + \alpha_{3j}x_{3j} + \alpha_{4j}x_{4j} \quad (5)$$

where  $U(x)$  is a total utility for each profile,  $\beta_0$  is a constant

$\alpha_{1j}$  is a delivery location utility of level j

$\alpha_{2j}$  is a delivery speed utility of level j

$\alpha_{3j}$  is a delivery cost utility of level j

$\alpha_{4j}$  is a return cost utility of level j

$x_{1j}, x_{2j}, x_{3j}, x_{4j}$  are dummy variables for the attribute levels and  $x_{1j}, x_{2j}, x_{3j}, x_{4j} = 1$  if the jth level of the ith attribute is present, otherwise  $x_{1j}, x_{2j}, x_{3j}, x_{4j} = 0$ . For example,

**Profile Number 1**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
1	<b>Level 3</b> Pick-up point	<b>Level 1</b> Express (1-2 working days)	<b>Level 1</b> Free (0 NOK)	<b>Level 2</b> 1-50 NOK

$x_{13}, x_{21}, x_{31}, x_{42} = 1$  and other dummy variables are equal to 0.

By taking the utility values of the attribute levels from Table 3.5 and based on the (5) formula we can calculate the total utility of profile 1.

$$U(x) = 4.272 + (-0.426) \times 1 + 0.314 \times 1 + 0.924 \times 1 + (-0.214) \times 1 = 4.87$$

Similarly, we will calculate total utilities for the rest eight profiles.

**Profile Number 2**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
2	<b>Level 2</b> Home	<b>Level 2</b> Standard (3-7 working days)	<b>Level 1</b> Free (0 NOK)	<b>Level 3</b> 51-100 NOK

$x_{12}, x_{22}, x_{31}, x_{43} = 1$  and other dummy variables are equal to 0.

$$U(x) = 4.272 + 0.349 \times 1 + (-0.314) \times 1 + 0.924 \times 1 + (-0.393) \times 1 = 4.838$$

**Profile Number 3**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
3	<b>Level 2</b> Home	<b>Level 1</b> Express (1-2 working days)	<b>Level 3</b> 51-100 NOK	<b>Level 2</b> 1-50 NOK

$x_{12}, x_{21}, x_{33}, x_{42} = 1$  and other dummy variables are equal to 0.

$$U(x) = 4.272 + 0.349 \times 1 + 0.314 \times 1 + (-0.689) \times 1 + (-0.214) \times 1 = 4.032$$

**Profile Number 4**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
4	<b>Level 1</b> Mailbox	<b>Level 1</b> Express (1-2 working days)	<b>Level 3</b> 51-100 NOK	<b>Level 3</b> 51-100 NOK

$x_{11}, x_{21}, x_{33}, x_{43} = 1$  and other dummy variables are equal to 0.

$$U(x) = 4.272 + 0.078 \times 1 + 0.314 \times 1 + (-0.689) \times 1 + (-0.393) \times 1 = 3.582$$

**Profile Number 5**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
5	<b>Level 3</b> Pick-up point	<b>Level 1</b> Express (1-2 working days)	<b>Level 2</b> 1-50 NOK	<b>Level 3</b> 51-100 NOK

$x_{13}, x_{21}, x_{32}, x_{43} = 1$  and other dummy variables are equal to 0.

$$U(x) = 4.272 + (-0.426) \times 1 + 0.314 \times 1 + (-0.235) \times 1 + (-0.393) \times 1 = 3.532$$

**Profile Number 6**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
6	<b>Level 1</b> Mailbox	<b>Level 2</b> Standard (3-7 working days)	<b>Level 2</b> 1-50 NOK	<b>Level 2</b> 1-50 NOK

$x_{11}, x_{22}, x_{32}, x_{42} = 1$  and other dummy variables are equal to 0.

$$U(x) = 4.272 + 0.078 \times 1 + (-0.314) \times 1 + (-0.235) \times 1 + (-0.214) \times 1 = 3.587$$

**Profile Number 7**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
7	<b>Level 1</b> Mailbox	<b>Level 1</b> Express (1-2 working days)	<b>Level 1</b> Free (0 NOK)	<b>Level 1</b> Free (0 NOK)

$x_{11}, x_{21}, x_{31}, x_{41} = 1$  and other dummy variables are equal to 0.

$$U(x) = 4.272 + 0.078 \times 1 + 0.314 \times 1 + 0.924 \times 1 + 0.607 \times 1 = 6.195$$

**Profile Number 8**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
8	<b>Level 2</b> Home	<b>Level 1</b> Express (1-2 working days)	<b>Level 2</b> 1-50 NOK	<b>Level 1</b> Free (0 NOK)

$x_{12}, x_{21}, x_{32}, x_{41} = 1$  and other dummy variables are equal to 0.

$$U(x) = 4.272 + 0.349 \times 1 + 0.314 \times 1 + (-0.235) \times 1 + 0.607 \times 1 = 5.307$$

**Profile Number 9**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
9	<b>Level 3</b> Pick-up point	<b>Level 2</b> Standard (3-7 working days)	<b>Level 3</b> 51-100 NOK	<b>Level 1</b> Free (0 NOK)

$x_{13}, x_{22}, x_{33}, x_{41} = 1$  and other dummy variables are equal to 0.

$$U(x) = 4.272 + (-0.426) \times 1 + (-0.314) \times 1 + (-0.689) \times 1 + 0.607 \times 1 = 3.45$$

The higher total utility means that the delivery profile has a higher preference. The summary of total utilities of nine delivery profiles and their rankings are illustrated in Table 5.3.

*Table 5.3 Total utility of each profile and profile ranking*

Profile number	Total Utility	Profile Rank
Card 1	4.87	3
Card 2	4.838	4
Card 3	4.032	5
Card 4	3.582	7
Card 5	3.532	8
Card 6	3.587	6
Card 7	6.195	1
Card 8	5.307	2
Card 9	3.45	9

According to the obtained results, the highest total utility has Profile 7 with attribute levels of delivery to mailbox, express delivery (1-2 working days), and delivery and return costs equal to 0 NOK. However, the less preferable profile for our respondents with the lowest total utility has Profile 9 with pick-up point, standard delivery, 51-100 delivery cost, and 0 NOK return cost of attribute levels (See Table 5.3).

## **5.2 Analysis of Statistical Results**

This sub-chapter will contain three parts. In the first part, we will describe the analysis results of each logistics service profile separately. In the second part, we will interpret the statistical results of our four delivery attributes separately. In the last part, we will illustrate the average importance of delivery attributes based on the socio-economic background of our survey participants.

### **5.2.1 Analysis of each profile**

In this part, by referring to the overall statistical results obtained from the conjoint analysis performed in SPSS (see Table 5.4) we will describe each logistics service profile based on their total utility values (see Figure 5.1) that illustrate the preference of our survey respondents at an aggregation level of the preference scores of each profile.

Table 5.4 Overall statistical results

Attributes	Averaged Importance Scores	Attribute Levels	Utility Value
Delivery Location	25.075	Mailbox	0.078
		Home	0.349
		Pick-up point	-0.426
Delivery Speed	14.373	Express (1-2 working days)	0.314
		Standard (3-7 working days)	-0.314
Delivery Cost	32.662	Free (0 NOK)	0.924
		1-50 NOK	-0.235
		51-100 NOK	-0.689
Return Cost	27.889	Free (0 NOK)	0.607
		1-50 NOK	-0.214
		51-100 NOK	-0.393

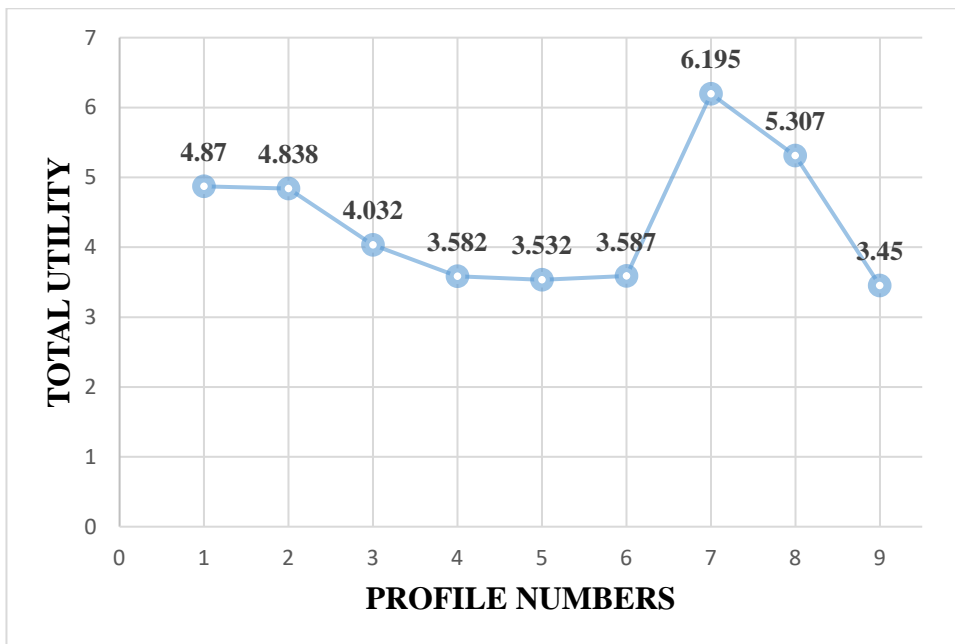


Figure 5.1 Preference scores for each profile

- **Profile 1**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
1	Pick-up point	Express (1-2 working days)	Free (0 NOK)	1-50 NOK

With a total utility of 4.87, profile 1 is the third preferred profile according to our survey participants' ratings. The reason for getting relatively good total utility is that two attribute levels (express for delivery speed and free for delivery cost) have the highest utility values

whereas one of the other two levels (pick-up point for delivery location) has the lowest utility value and the last attribute level (1-50 NOK for return cost) is in the middle. It seems that the least preferred level of delivery location (pick-up point) and 1-50 NOK for the return cost are somewhat acceptable to our respondents given the existence of fast and free delivery.

- **Profile 2**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
2	Home	Standard (3-7 working days)	Free (0 NOK)	51-100 NOK

With a total utility value of 4,838, profile 2 is the fourth preferred profile for our respondents. The lowest utility value of the return cost attribute level (51-100 NOK) has a negative impact on the total utility value of the profile 2. 51-100 NOK for return cost got the lowest utility value according to our analysis, which means that it is too expensive for our respondents, hence not preferred. The standard level of delivery speed is also the least favorable option of delivery speed. However, profile 2 is relatively acceptable by our respondents because it contains the two most preferred delivery attribute levels (home for delivery location and 0 NOK for delivery cost).

- **Profile 3**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
3	Home	Express (1-2 working days)	51-100 NOK	1-50 NOK

Profile 3 has a total utility score of 4.032 which makes it the fifth preferred profile among the presented nine profiles making it a neutral choice. Even though this profile includes the two best levels for delivery location and delivery speed, the profile is placed in the middle of the customer choices. Low purchasing preference can be a result of the high delivery cost and the high return cost. The consumers may receive fast and convenient service (home delivery, express delivery) but the high delivery price makes the consumers more price sensitive. The importance value of the delivery cost is the highest followed by return cost (see Table 5.4) which means that these two attributes may have a significant impact on consumer's purchasing decisions. Therefore, the lowest level in delivery cost and middle level of return cost does not make the profile attractive to consumers even though two other attribute levels are the most preferred ones.

- **Profile 4**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
4	Mailbox	Express (1-2 working days)	51-100 NOK	51-100 NOK

Profile 4 is the third least satisfying profile with a total utility score of 3.582. The reason that this profile is less preferable is that it contains two worst levels of delivery cost and return cost attributes which received high averaged importance scores in our analysis. With the best level of delivery speed (express, and to some extent acceptable middle level of delivery location (mailbox), the negative impact of high delivery and return costs are compensated.

- **Profile 5**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
5	Pick-up point	Express (1-2 working days)	1-50 NOK	51-100 NOK

Profile 5 is the second least preferred option with a total utility value of 3.532. This profile has two least preferring levels (pick-up point for delivery location and 51-100 NOK for return cost). In this profile, the return cost level has the lowest utility value which means that returning process of the apparel products is considered too expensive for our participants. It may be a reason for our respondents not to give a high score to this profile. Although delivery speed's level (express) has the highest utility score, but the attribute's averaged importance value is the lowest. Therefore, it does not play too much role in the consumer choice for this profile making it one of the less preferred ones. 1-50 NOK delivery cost is the middle level for this attribute. But given the highest importance value of delivery cost attribute, we infer that consumers prefer free delivery more and are not willing to pay the delivery fee even for having their purchased items delivered fast. Moreover, the pick-up point is the least preferred level for the delivery location. With two least preferred levels and one middle level, this profile is not appealing to our respondents.

- **Profile 6**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
6	Mailbox	Standard (3-7 working days)	1-50 NOK	1-50 NOK

With a total utility value of 3.587, profile 6 took sixth place among the nine profiles. The moderate levels of delivery cost and return cost and the high average values of these attributes make the profile unappealing for our respondents. The unattractiveness of this



profile is also caused by the least preferable delivery speed level (standard). To some extent preferable level of delivery location with the third averaged importance score does not make the profile appealing for our respondents.

- **Profile 7**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
7	Mailbox	Express (1-2 working days)	Free (0 NOK)	Free (0 NOK)

With the highest total utility value of 6.195, profile 7 is the most beloved profile for our survey participants. Two attributes with the high average importance scores with the most preferred levels (free delivery and return) as well as the most preferred level of delivery speed (express) make this profile the most favorable for our respondents. The results of our analysis show that the most preferred delivery location for our survey participants is home delivery and the mailbox is acceptable to some extent. However, the results obtained from profile 7 illustrate that even though our respondents do not consider a mailbox as the most preferred delivery location, it is not a very strong determinant for our respondents' preference given the presence of the rest most important attribute levels.

- **Profile 8**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
8	Home	Express (1-2 working days)	1-50 NOK	Free (0 NOK)

Profile 8 is the second most popular profile among our respondents with a total utility value of 5.307. Even though this profile contains the three best attribute levels (0 NOK for return cost, home for delivery location and express for delivery speed), it took second place among the nine profiles. It is a consequence of delivery cost level (1-50 NOK) which is the second preferred one based on its utility value among our respondents but its impact on the overall satisfaction with the profile is high because the delivery cost attribute is the one with the highest averaged importance value. The other three attributes have the most preferred levels for our respondents. As a result, Profile 8 becomes the second most satisfactory profile among our survey participants.

- **Profile 9**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
9	Pick-up point	Standard (3-7 working days)	51-100 NOK	Free (0 NOK)

With the lowest total utility value of 3.45, profile 9 is the least preferred one among the nine profiles. The relatively low total utility is a result of three less preferred delivery attribute levels (pick-up point for delivery location, standard for delivery speed and 51-100 NOK for delivery cost). Fast and less expensive delivery, as well as convenience, plays a significant role in making the consumers satisfied. Since these requirements are not met in profile 9, it received the lowest score. Although return cost level (0 NOK) has the highest utility value and return cost attribute has the second-highest averaged importance score, it seems that first of all consumers pay attention to delivery fee and try to avoid higher delivery costs when they purchase apparel products online.

### 5.2.2 Analysis of each attribute and level

In this sub-chapter, we will analyze each attribute separately by elaborating more on the obtained utility values of the attribute levels. Moreover, we will try to connect the analysis results to the existing literature results.

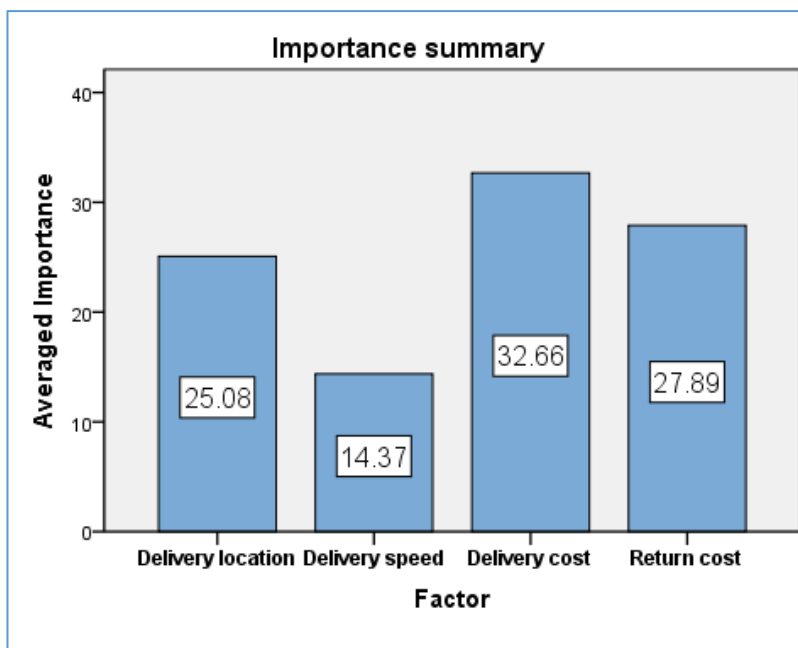


Figure 5.2 Averaged importance scores of four attributes

According to our analysis, the highest average importance score obtained delivery cost attribute. The second place is taken by return cost attribute. The delivery location received the third averaged importance value followed by delivery speed (see Figure 5.2).

#### **Delivery Cost**

We will start our analysis with the most preferred delivery attribute among our survey participants. With a relative importance score of 32.66, the delivery cost is the most popular attribute for our respondents (see Figure 5.2). This attribute has three levels, one of which

(free delivery) is strongly preferred by our respondents because it obtained the highest utility value (see Figure 5.3).

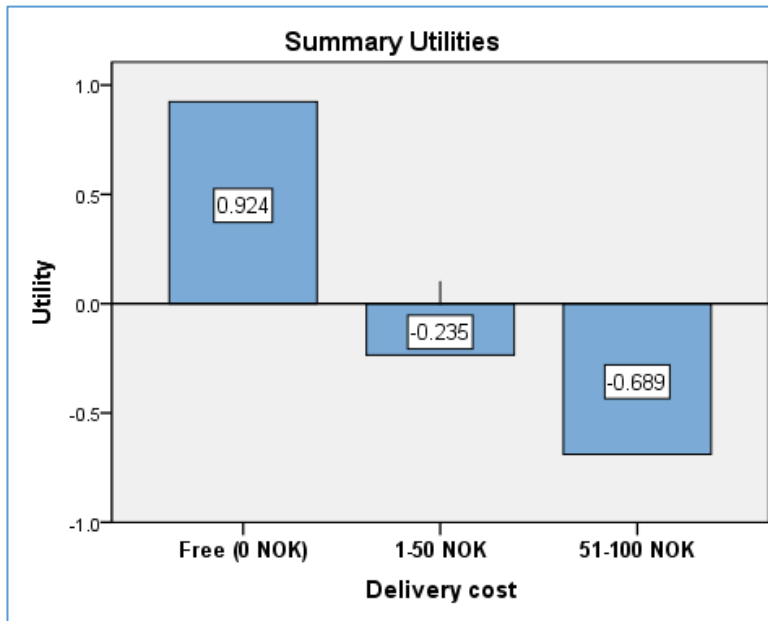
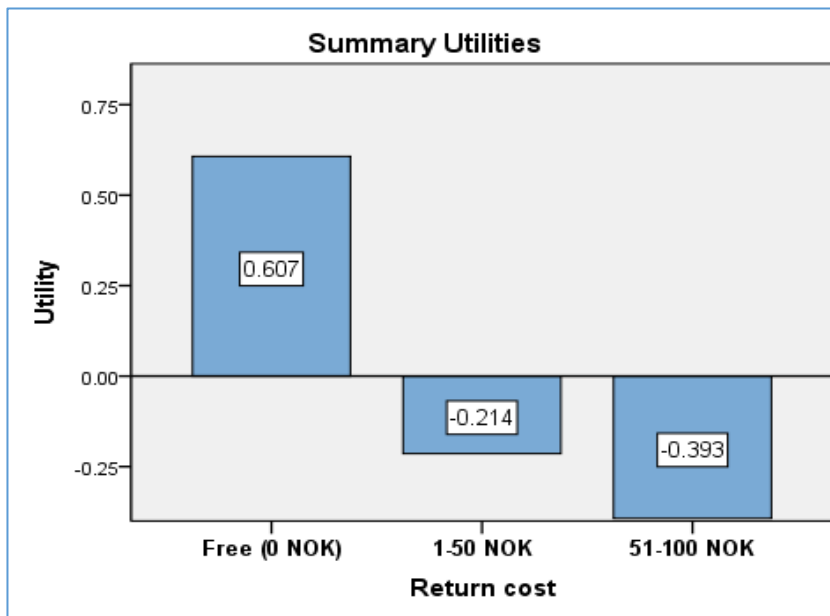


Figure 5.3 Utility values for delivery cost

Free delivery played a significant role in the decision-making of our survey participants. This is also confirmed by the most favorable profile for our respondents (profile 7) having free delivery option present among the four attributes. The importance of free delivery is also claimed by theory. For instance, Becerril-Arreola, Leng and Parlar (2013) claim that offering free delivery to consumers is a powerful strategy to have a positive impact on their purchasing decision and increasing satisfaction. The study results conducted by Gawor and Hoberg (2018) also indicate that delivery price is the most important attribute for consumers when they make an online purchase. With a sharp drop from the first level to a negative utility value of -0.235, the second level is somewhat acceptable for our respondents and it is proved by the second most favorable profile (profile 8). When we look at profile 8, it is visible that Norwegian consumers may accept to pay 1-50 NOK for fast delivery and having their purchased items delivered directly to their homes. However, with the lowest utility value of -0.689, the third level of delivery cost attribute is not acceptable by our respondents. Therefore, we can assume that Norwegian consumers are not willing to accept the delivery cost of 51-100 NOK. This can be also proved by the least preferable profile (profile 9) which contains the worst level of delivery cost attribute (51-100 NOK). The importance of delivery cost for consumers is also proved by the DIBS' annual (2018) report about e-commerce in Nordics. The report shows that high delivery price is the main reason to cancel the online purchase. The expensive delivery may be an obstacle for the consumers to make a purchase.

Consumers usually evaluate delivery fees before making an online purchase. According to PostNord's E-commerce in the Nordics – six-month report 2019, 26% of 10,498 surveyed Norwegian consumers mentioned that too expensive delivery options were the reason for incomplete purchase (Andersson and Teder 2019). Moreover, when we compare the utility values of each level (see Figure 5.3), we see that the impact of delivery cost on consumers' purchasing decision is higher when delivery cost rises from 1-50 NOK to 51-100 NOK compared to the increase from 0 NOK to 1-50 NOK. Therefore, online retailers may implement strategies to lower delivery costs to make their consumers satisfied. As stated by Rao, et al. (2011) consumer satisfaction with delivery service price has a significant impact on consumers' satisfaction of overall purchase.

### *Return Cost*



*Figure 5.4 Utility values for return cost*

With an averaged importance score of 27.89 (see Figure 5.2), the return cost attribute is the second preferred attribute for our survey participants. By looking at the utility values of this attribute's levels (see Figure 5.4), we see that free return has a substantially high utility value (0.607) compared to the other two levels that have negative values of -0.214 and -0,393.

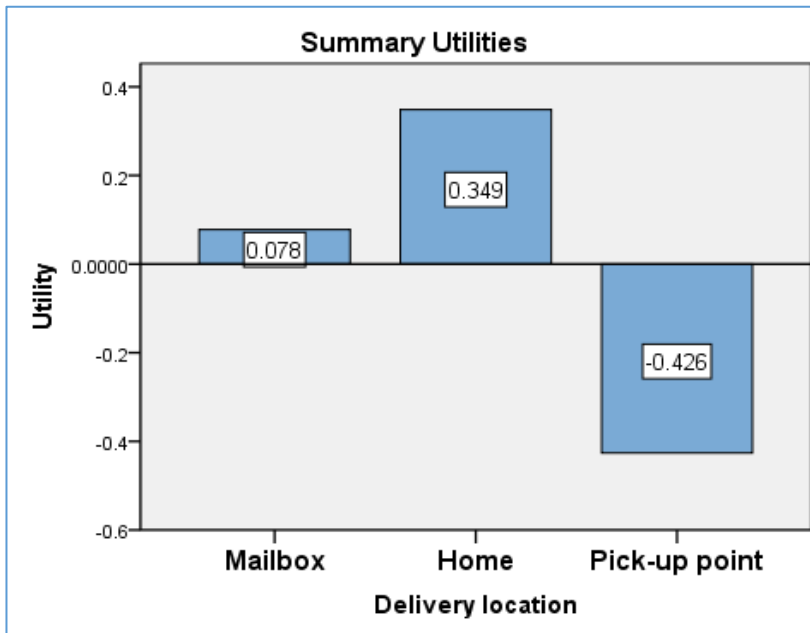
Based on the results obtained from our analysis we can claim that free return is clearly the best choice which is also proved by the profile rating of our survey participants. The most preferred profiles (profiles 7 and 8) include free return among the four attributes. Heinemann and Schwarzl (2010) indicate that a free return policy plays a significant role in maintaining good business relationships with consumers. Figure 5.4 illustrates a huge change in a utility value from a first level's positive value (0.607) to a steep decline to a second level's negative

value (-0.214). By comparing the utility values of the return cost levels (see Figure 5.4), it becomes obvious that the return fee has a substantial influence on the purchasing decision of our survey respondents.

When we look at the second and third low-rated profiles (profiles 5 and 4) among our survey respondents, we see that these profiles contain 51-100 NOK return cost level that may be a reason for the low ranking of the profiles. According to our analysis results, the return costs' impact is lower on purchasing decision when it increases from 1-50 NOK to 51-100 NOK than going up from free return to return fee of 1-50 NOK. As a result, we can infer that Norwegian consumers will reject high return costs when they purchase apparel products online. The importance of free returns is also stated by Culinane, et al. (2017). The authors indicate that a proper return policy with free returns may cause an increase in consumer satisfaction and lead to increased sales revenues.

### ***Delivery location***

With an averaged importance score of 25.08 (see Figure 5.2), delivery location is the third preferred attribute among our survey participants. Figure 5.5 illustrates that home delivery and delivery to the mailbox are the first and the second preferred options when consumers choose a delivery location to have they purchased products delivered.



*Figure 5.5 Utility values for delivery location*

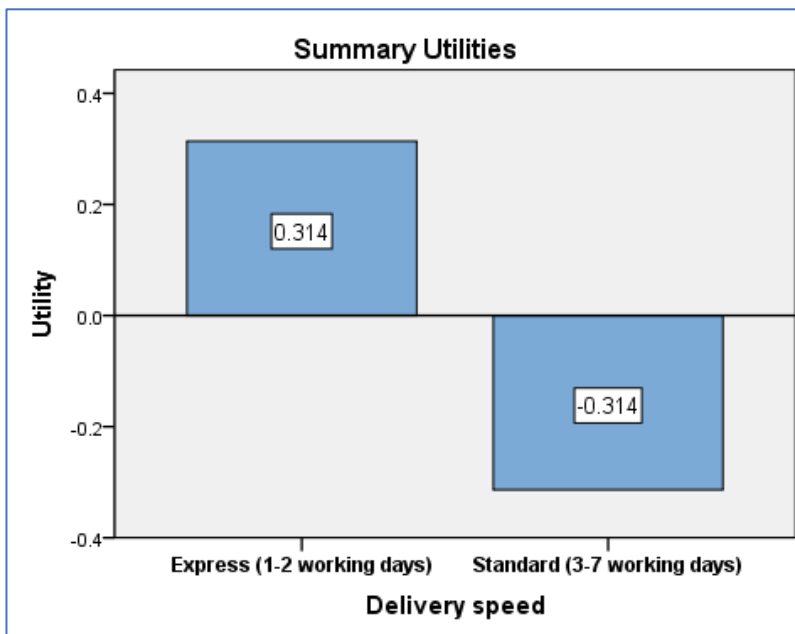
With a utility value of 0.349, home delivery is the most desired delivery location. A mailbox level with also a positive utility value of 0.078 is acceptable to our surveyed respondents to some extent. However, the pick-up point is not considered a desirable location to receive the purchase among our participants. It has a negative utility value of -0,426 and we can see a

sharp reduction from the most preferred delivery location's option (home) to the least preferred delivery location (pick-up point). The two least preferred profiles (profile 9 and 5) by our respondents include the pick-up point as a delivery location.

We can infer that convenience and no waste of time to travel to the pick-up point to receive their purchase may be the reasons for our survey participants to choose home delivery as the most preferred delivery location. Even though according to Xiao, et al. (2017), pick-up points can be beneficial for retailers to solve inefficiency issues in their SCs and avoid expensive home deliveries, the results of the study conducted by Gawor and Hoberg (2018) claim that consumers prefer home deliveries more than pick-up point. The results of our analysis also indicate that home deliveries are the most desirable option for the delivery location.

### ***Delivery speed***

Compared to the other three delivery attributes of our analysis, delivery speed is the least important attribute according to our survey results which received the lowest importance score of 14.37 (see Figure 5.2).



*Figure 5.6 Utility values for delivery speed*

Surprisingly, delivery speed received the lowest importance value. From our literature review, we had a perception that delivery speed is one of the most important factors that has a great influence on consumer decision-making. For example, Siegfried and Zhang (2021) indicate that by providing fast delivery the retailers will make their consumers satisfied because the consumers have a perception that online purchased products are shipped immediately after placing an order. Therefore, it is very important to meet consumer

expectations. Marino, Zotteri and Montagna (2018) also share the same opinion. The authors indicate that when consumers make purchasing decisions, they consider delivery speed as the main factor. From the business perspective, Siegfried and Zhang (2021) claim that fast delivery is the main factor for achieving high service levels which is essential for online retailers because they compete through service levels. However, our survey results demonstrate the opposite. The other three attributes were more important for our respondents when they make purchasing decisions.

When we look at the utility values for delivery speed levels (see Figure 5.6) obtained from our analysis, we see that express delivery (1-2 working days) is obviously welcomed by our respondents with a positive utility value of 0.314. Standard delivery speed (3-7 working days) received a negative utility value of -0.314. From Figure 5.6 we can also notice a huge change from positive to negative utility values among two delivery speed levels. Therefore, we can assume that Norwegian consumers do not accept standard delivery and prefer fast delivery. This is apparent from the analysis of delivery profiles. The three most popular profiles (profiles 7, 8 and 1) include express delivery as one of the delivery attributes. As stated by Hua, Wang and Cheng (2010) delivery speed plays a significant role in consumer satisfaction and greatly affects their purchasing decision.

### **5.2.3 Averaged importance of attributes based on socio-economic variables**

In this part of our study, we will explore the preference heterogeneity of our survey participants about their chosen delivery attributes based on socio-economic background. Identification of consumer preferences according to their socio-economic background may serve as important information for retailers to develop new business strategies and improve delivery service.

The summary of the averaged importance scores of delivery attributes based on the socio-economic background of survey participants is presented in Table 5.5. The statistics results of different groups based on their socio-economic background are illustrated in Appendix F. According to our analysis results, the delivery cost is the most important factor for most age groups except “55-64 years” and “65 years and more”. The former group considers return cost as an important factor when they purchase apparel products online. The only participant in the latter group highlights delivery location and the results of Appendix F show that from available three location levels this respondent prefers pick-up point to receive the purchase. Within the age category, the express deliveries are mostly valued by

the respondents from the “16-24 years” group and least important for the “35-44 years” group.

*Table 5.5 Summary of averaged importance scores of delivery attributes based on socio-economic variables*

Socio-economic variables	Category (number of respondents)	Delivery location	Delivery speed	Delivery cost	Return cost
<b>Age</b>	16-24 years (8)	18.421	25	28.947	27.632
	25-34 years (32)	22.497	14.736	40.045	22.722
	35-44 years (28)	17.792	11.367	42.834	28.007
	45-54 years (7)	13.846	23.077	47.692	15.385
	55-64 years (6)	12.644	17.241	32.184	37.931
	65 years and more (1)	42.105	15.789	21.053	21.053
<b>Gender</b>	Female (30)	18.592	13.147	45.95	22.311
	Male (52)	19.661	17.119	36.271	26.949
<b>Education level</b>	Below high school (3)	19.355	22.581	25.806	32.258
	High school (16)	17.647	21.324	37.5	23.529
	Bachelor's degree (29)	17.957	21.362	39.009	21.672
	Master's degree and higher (34)	22.088	9.839	41.365	26.707
<b>Work status</b>	Studying (27)	26.308	13.154	37.058	23.479
	Employed (54)	16.383	16.626	41.849	25.142
	Unemployed (0)				
	Retired (1)	42.105	15.789	21.053	21.053
<b>Monthly income</b>	No income (5)	25.989	8.475	35.028	30.508
	Less than 20 000 NOK (25)	20.466	13.731	41.192	24.611
	20 000 - 34 999 NOK (16)	16.279	12.791	44.186	26.744
	35 000 - 49 999 NOK (16)	8.26	19.764	42.478	29.499
	50 000 NOK and more (8)	23.166	22.008	40.154	14.672
	Prefer not to answer (12)	31.405	14.05	28.926	25.62

Comparing the averaged importance values for delivery attributes for males and females, it is visible from Table 5.5 that for our female respondents, the delivery cost is more important than for male respondents. However, the other three attributes received the opposite results. Return cost followed by delivery location and delivery speed have higher values and are considered more important for male respondents compared to females. By looking at the two larger groups of the “Work Status” category, we can see that delivery cost, return cost and delivery speed is more important for our employed participants, whereas delivery location is considerably important for those participants who are students. The delivery location is the most favorite attribute of our retired participant.

The return cost is considered the most important factor for the participants having the education level of “below high school”. From the data in Table 5.5, we can see that with the increase of the education level of our respondents from “Below high school” to “Master's



degree and higher” the averaged importance of the delivery cost also increases. In other words, the more educated are the respondents, the more they consider delivery cost as an important factor when they decide to purchase apparel products online. With a significantly low averaged importance value compared to other education levels, the “Master's degree and higher” group considers delivery speed less important and give their highest preference to delivery cost attribute.

Delivery location is the most important attribute for the participants from the “Monthly income” category who preferred not to provide information about their monthly income. Most of the groups of this category consider delivery cost as an important factor when they decide to make an online purchase. However, among those groups, the delivery cost is the most valuable factor for the respondents who have a monthly income of 20 000 – 34 999 NOK. With the substantially low averaged importance value, delivery speed is the less preferred factor for the “35 000 - 49 999 NOK” monthly income group.

#### 5.2.4 Simulations analysis

Part-worth utilities obtained from the conjoint analysis help us to understand how desirable attribute levels are. However, gathering information about the utility values of attribute levels is not the main objective for researchers. Instead, predicting the future behavior of consumers by simulating consumer choices, discovering the best portfolio of products and services, and evaluating market share based on consumer preferences are important from a managerial perspective. Therefore, market simulation is conducted to receive information about the relative share of survey participants who prefer predetermined products/services in a certain competitive environment. Market simulations help managers to examine alternative market scenarios (Steiner and Meißner 2018).

To create simulation cards, we referred to the information obtained from the current market situation in Norway (see Table 2.1). We selected the five most popular online stores and their logistics services to create simulation cards (see Table 5.6).

*Table 5.6 The list of simulation cards*

Simulation Card	Delivery Location	Delivery Speed	Delivery Cost	Return Cost
1. zalando.no	mailbox	standard (3-7 working days)	free	1-50 NOK
2. hm.com	home	express (1-2 working days)	51-100 NOK	free

3. xxl.no	pick-up point	express (1-2 working days)	free	51-100 NOK
4. nelly.com	home	standard (3-7 working days)	1-50 NOK	1-50 NOK
5. ellos.no	pick-up point	standard (3-7 working days)	1-50 NOK	free

By entering the simulation cards list to the orthogonal design of our study and performing simulation analysis in SPSS we obtained preference scores (see Table 5.7) and preference probabilities (see Table 5.8) of each simulation card. SPSS performs simulation analysis and measures preference scores and probability by using the utility values from Table 5.2. Simulation analysis in SPSS is also performed by using syntaxes (see Appendix H).

According to the obtained results for preference scores illustrated in Table 5.7, with the highest score of 4.852, Card 2 is the most desired one for the consumers. The second and third places are taken by Card 1 and Card 3 with the preference scores of 4.746 and 4.69, respectively. Card 5 is the fourth preferred with a preference score equal to 4.408. The least preferred card is Card 4 with the lowest preference score of 3.858.

*Table 5.7 Preference scores of simulations*

Card Number	ID	Score
1	Zalando.no	4.746
2	hm.com	4.852
3	xxl.no	4.690
4	nelly.com	3.858
5	ellos.no	4.408

The simulation summary also provides the result about probabilities of selecting particular simulation profiles. The software uses three different choice models for probability calculation one of which is called the maximum utility model. This model is the most popular method to simulate market share. It can be described as the probability of selecting the most preferred profile. The higher is the preference probability, the higher will be the market share. The BTL (Bradley-Terry-Luce) model calculates the probability of selecting a profile as the most desired by dividing the utility of the profile by the sum of total utilities of all simulations. The logit model is very much alike to BTL. However, it uses a natural log of the utilities in place of the utilities. The simulation results of preference probabilities are illustrated in Table 5.8.

Table 5.8 Preference Probabilities of simulations

Preference Probabilities of Simulations				
Card Number	ID	Maximum Utility <sup>a</sup>	Bradley-Terry- Luce	Logit
1	Zalando.no	18.1%	21.2%	20.0%
2	hm.com	28.7%	21.5%	25.8%
3	xxl.no	30.0%	21.1%	25.0%
4	nelly.com	5.6%	16.7%	11.1%
5	ellos.no	17.5%	19.5%	18.2%

a. Including tied simulations

Table 5.8 illustrates the predicted market share for each card. Based on the maximum utility model results, with the highest market share of 30%, Card 3 is the most desirable for consumers. In other words, when this online store offers similar products with the same price as its competitors, the consumers will be willing to select the online store which provides free and 1-2 working days delivery in a pick-up point with a return cost of 51-100 NOK. However, according to BTL model results, the highest market share got Card 2 (21.5 %) followed by almost similar results for Card 1 and Card 3. According to Logit model results, Card 2 is also a favorite. This means, given the similarity and the same price of the products, the consumers will choose the online store which provides express home delivery for 51-100 NOK delivery fee and free return.

## 6.0 Conclusions

We will start this chapter with a summary of key findings and analysis. Moreover, this chapter will also include managerial implications, limitation of the study and recommendation for further research.

### 6.1 Research summary

Our study examined the preferences of Norwegian consumers in logistics services when they make an online purchase of apparel products. We used a survey-based statistical technique to determine what combination of delivery attributes is most influential on Norwegian consumers' decision-making.

The objective of our first question was to identify the main attributes and their levels that consumers value when they choose delivery service for apparel products bought online. The results of the first question played an important role in our study because the attributes and their corresponding levels were mandatory for conducting conjoint analysis. Therefore, to meet the objective of the first question of our study we analyzed the existing literature of previous works and identified several logistics attributes that were considered important for consumers when they make an online purchase. Moreover, we investigated the websites of five popular online stores in Norway to select attribute levels in accordance with the current market situation. By conducting a pilot study, we narrowed down the number of attributes and their levels. As a result, we selected four attributes with their corresponding levels:

1. delivery location (Mailbox, home, pick-up point)
2. delivery speed (express and standard)
3. delivery cost (0 NOK, 1-50 NOK, 51-100 NOK)
4. return cost (0 NOK, 1-50 NOK, 51-100 NOK)

Our second objective was to understand how Norwegian consumers value and decide on delivery attributes when they make an online purchase of apparel products and which attribute levels play a significant role in their decision-making process. To achieve the second objective, we conducted conjoint analysis after asking the respondents to rate 9 different profiles created through orthogonal design. As a result, we obtained the relative importance values for each attribute and the utility estimates for each attribute level. By using the obtained data from the analysis, we calculated preference scores for each profile. According to the results of our analysis, the most preferred profile by our respondents become the profile that included free and express delivery to a mailbox with a free return process. Moreover, the most valued attribute for consumers is delivery cost followed by

return cost, delivery location and delivery speed. The data obtained from our analysis shows that cost-related attributes are the most important ones. The most preferred profile shows that consumers are willing to make trade-offs. For instance, for delivery location, home delivery with the highest utility value is the most preferred delivery location. However, the consumers are willing to receive their shopped apparel products in the mailbox when they are offered free and express delivery with free return. In contrast to previous studies, delivery speed is the least preferred factor for Norwegian consumers. Our analysis results about averaged importance scores of attributes based on socio-economic variables also indicated that delivery cost was the most important factor for most of our consumers from different socio-economic groups. Moreover, with the increase of education level of our respondents, the relative importance value of delivery cost attribute increases. This means the more educated are the consumers, the more cost-sensitive they are. The delivery cost factor was also more important for female consumers compared to males.

Based on the results of our simulation analysis and maximum utility model, simulation card 3 (pick-up point for delivery location, 1-2 days for delivery speed, 0 NOK for delivery cost and 51-100 NOK for return cost) with the highest market share of 30% will be the consumers' favorite. This means that when online stores offer apparel products with similar prices, the consumers will choose the online store that provides free and fast delivery to pick-up point with a return cost of 51-100 NOK. On the one hand, the online apparel stores and their logistics service providers may use this valuable information to redesign their strategies to increase the efficiency of logistics services. On the other hand, they will be able to meet the requirements of their consumers and increase satisfaction.

## **6.2 Managerial implications**

Understanding consumers' preferences and designing an appropriate value proposal plays a significant role in achieving success in today's competitive market. Moreover, by understanding consumers' preferences for logistics services, online retailers can create such a value proposition that would maximize their market share or increase profits and contribute to the best use of their limited resources. Last-mile delivery is an important factor that has a substantial impact on the purchasing decisions of online consumers. Moreover, it is the most cost-intensive and challenging part of a supply chain. Up till now, different studies have examined what consumers find important in last-mile delivery. However, understanding consumers' preferences of logistics services when they purchase apparel products online has received less attention. Therefore, our study can be a good contribution to the existing

literature. During our study, we tried to explore how different delivery attributes should be composed to remain attractive to online consumers. By performing conjoint analysis, we investigated how consumers trade-off delivery attributes and their levels in the choice of last-mile delivery when they shop apparel products online.

According to our analysis results, the delivery cost is the most important factor for most of the consumer segments from different socio-economic backgrounds. However, there were some groups of consumers who valued other attributes, for instance, delivery location, more. Therefore, the online stores and LSPs can implement more consumer-oriented delivery strategies to meet the requirements of consumers from different segments. For instance, the consumer segments that prefer their purchased products to be delivered directly to their home are willing to accept some delivery costs (e.g., profile 8 with a 1-50 NOK delivery cost is the second most preferred profile among our survey participants). It is very challenging for online stores and their LSP to increase the quality of their delivery service by offering delivery service with the attribute levels that received the highest utility values. For example, it is very costly to offer free and fast delivery service with a free return of the products. As a result, the interpretation of how consumers trade-off delivery attributes and their levels will help the online stores and LSPs to design a reasonable set of logistics service attribute levels and implement a strategy that will lead to mutually beneficial results. In other words, by meeting the needs and requirements of their consumers, the online retailers and LSP will be able not only to increase the satisfaction level of their consumers but also increase their market shares which is essential in a highly competitive marketplace.

### **6.3 Limitations of the study**

One of the limitations of this study that may have a substantial impact on the results of the study is the selected number of attributes and their levels. Including more attributes with more levels may have a substantial impact on how consumers trade-off delivery attributes and their levels in the preference of last-mile delivery service when they make an online purchase of apparel products. Moreover, the participants of this study were from three Norwegian cities. Therefore, the results obtained from this analysis may represent the preferences of the consumers from three cities. Last but not least, because of the restrictions of Covid 19 we could not distribute the hard copies of the questionnaire and could gather the responses by distributing our online questionnaire link. This reduced our sample size to some extent.

## **6.4 Suggestions for further research**

The limitations mentioned in the previous sub-chapter may serve as the foundation for new research. Given the lack of existing literature in this field, future research can fill in this gap by expanding the number of attributes and including more attribute levels to understand the preferences of the consumers for logistics services within online apparel retailing. Moreover, the collaboration with online retailers or LSP will be beneficial in understanding their current challenges and finding the solutions. The combination of qualitative and quantitative research may lead to better identification and resolution of the problems. Increasing the study sample size by including more geographical locations may also increase the accuracy of the study results.

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## Appendix A: Pilot study questionnaire

**Please mention the delivery and shipping options that you would choose when you buy clothing online.**

1. Select delivery locations where you would be willing to receive your purchase.

(Delivery Location)

- Mailbox
- Home
- Pick up point
- Neighbor's home
- Other: .....

2. Select the options that you would be willing to wait to receive your purchase (Delivery Speed)

- Same day
- Next Day (24 hours)
- Within a week
- Within 2 weeks
- Other: .....

3. Select the options that you would be willing to pay for your purchase delivery. (Delivery Fee)

- Free (0 NOK)
- 1-50 NOK
- 51-100 NOK
- More than 100 NOK
- Other: .....

4. Select the options that you would be willing to receive your purchase (Delivery Days)

- Working Days
- 7 days in a week
- Other: .....

5. Select the options that you would be willing to be informed about your purchase and arrival date (Delivery Information)

- SMS

- e-mail
- Other: .....

6. Select the options that you would be willing to pay for your purchase return? (Return Cost)

- Free (0 NOK)
- 1-50 NOK
- 51-100 NOK
- Other: .....

## Appendix B: Profile cards

**Profile Number 1**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
1	Pick-up point	Express (1-2 working days)	Free (0 NOK)	1-50 NOK

**Profile Number 2**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
2	Home	Standard (3-7 working days)	Free (0 NOK)	51-100 NOK

**Profile Number 3**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
3	Home	Express (1-2 working days)	51-100 NOK	1-50 NOK

**Profile Number 4**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
4	Mailbox	Express (1-2 working days)	51-100 NOK	51-100 NOK

**Profile Number 5**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
5	Pick-up point	Express (1-2 working days)	1-50 NOK	51-100 NOK

**Profile Number 6**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
6	Mailbox	Standard (3-7 working days)	1-50 NOK	1-50 NOK

**Profile Number 7**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
7	Mailbox	Express (1-2 working days)	Free (0 NOK)	Free (0 NOK)

**Profile Number 8**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
8	Home	Express (1-2 working days)	1-50 NOK	Free (0 NOK)

**Profile Number 9**

Card ID	Delivery location	Delivery speed	Delivery cost	Return cost
9	Pick-up point	Standard (3-7 working days)	51-100 NOK	Free (0 NOK)



## Appendix C: Main study questionnaire

### Consumer preferences for logistics services within online apparel retailing

We are 2 master students at Molde University College doing research on consumer preferences for logistics services within online apparel retailing. The reason of this research is to understand how the consumers value different characteristics of logistics services when buying apparel online. The questionnaire will take you less than 3 minutes to complete, the results are anonymous and will be used only for academic purposes. Thank you in advance for participation.

Lusine and Victor



Next

## Socio-Demographic Characteristics

Which category below includes your age? \*

- 16-24 years
- 25-34 years
- 35-44 years
- 45-54 years
- 55-64 years
- 65 years and more

What is your gender? \*

- Female
- Male

What is the highest degree or level of education you have completed? \*

- Below High School
- High School
- Bachelor's degree
- Master's degree and higher

What is your work status? \*

- Studying
- Employed
- Unemployed
- Retired

What is your monthly income? \*

- No income
- Less than 20 000 NOK
- 20 000 - 34 999 NOK
- 35 000 - 49 999 NOK
- 50 000 NOK and more
- Prefer not to answer





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## Choice-Tasks

Imagine that you are buying apparel online. You will be presented with the 9 options composed of 4 different delivery attributes with levels (See picture below) and will be asked to rate them in a 7-point scale.

Delivery attributes with levels





<b>Delivery Location</b> <input type="checkbox"/> Mailbox <input type="checkbox"/> Home <input type="checkbox"/> Pick-Up Point 	<b>Delivery Speed</b> <input type="checkbox"/> Express (1-2 working days) <input type="checkbox"/> Standard (3-7 working days) 
<b>Delivery Cost</b> <input type="checkbox"/> Free (0 NOK) <input type="checkbox"/> 1-50 NOK <input type="checkbox"/> 51-100 NOK 	<b>Return Cost</b> <input type="checkbox"/> Free (0 NOK) <input type="checkbox"/> 1-50 NOK <input type="checkbox"/> 51-100 NOK 

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## Choice Rating





1. How likely is it that you would choose the following option when you buy apparel products online? (1= very unlikely and 7= very likely) \*

 <b>Pick-up Point</b>	 <b>Delivery Speed: Express (1-2 working days)</b>
 <b>Delivery Cost: Free (0 NOK)</b>	 <b>Return Cost: 1-50 NOK</b>

1    2    3    4    5    6    7

Very Unlikely    ○    ○    ○    ○    ○    ○    ○    Very Likely





2. How likely is it that you would choose the following option when you buy apparel products online? (1= very unlikely and 7= very likely) \*

 Home Delivery	Delivery Speed: Standard (3-7 working days) 
 Delivery Cost: Free (0 NOK)	 Return Cost: 51-100 NOK

1 2 3 4 5 6 7

Very Unlikely        Very Likely





3. How likely is it that you would choose the following option when you buy apparel products online? (1= very unlikely and 7= very likely) \*

 Home Delivery	Delivery Speed: Express (1-2 working days) 
 Delivery Cost: 51-100 NOK	 Return Cost: 1-50 NOK

1 2 3 4 5 6 7

Very Unlikely        Very Likely





4. How likely is it that you would choose the following option when you buy apparel products online? (1= very unlikely and 7= very likely) \*

 Mailbox Delivery	Delivery Speed: Express (1-2 working days) 
 Delivery Cost: 51-100 NOK	 Return Cost: 51-100 NOK

1 2 3 4 5 6 7

Very Unlikely        Very Likely





5. How likely is it that you would choose the following option when you buy apparel products online? (1= very unlikely and 7= very likely) \*

 In-Store Pick-up	Delivery Speed: Express (1-2 working days) 
 Delivery Cost: 1-50 NOK	 Return Cost: 51-100 NOK

1 2 3 4 5 6 7

Very Unlikely        Very Likely





6. How likely is it that you would choose the following option when you buy apparel products online? (1= very unlikely and 7= very likely) \*

 Mailbox Delivery	Delivery Speed: Standard (3-7 working days) 
 Delivery Cost: 1-50 NOK	 Return Cost: 1-50 NOK

1 2 3 4 5 6 7

Very Unlikely        Very Likely





7. How likely is it that you would choose the following option when you buy apparel products online? (1= very unlikely and 7= very likely) \*

 Mailbox Delivery	Delivery Speed: Express (1-2 working days) 
 Delivery Cost: Free (0 NOK)	 Return Cost: Free (0 NOK)

1 2 3 4 5 6 7

Very Unlikely        Very likely





8. How likely is it that you would choose the following option when you buy apparel products online? (1= very unlikely and 7= very likely) \*

 <p><b>Home Delivery</b></p>	 <p><b>Delivery Speed: Express (1-2 working days)</b></p>
 <p><b>Delivery Cost: 1-50 NOK</b></p>	 <p><b>Return Cost: Free (0 NOK)</b></p>

1   2   3   4   5   6   7

Very Unlikely                        Very Likely

9. How likely is it that you would choose the following option when you buy apparel products online? (1= very unlikely and 7= very likely) \*

 <p><b>Pick-up Point</b></p>	<p><b>Delivery Speed: Standard (3-7 working days)</b></p> 
 <p><b>Delivery Cost: 51-100 NOK</b></p>	 <p><b>Return Cost: Free (0 NOK)</b></p>

1   2   3   4   5   6   7

Very Unlikely                        Very Likely

## Appendix D: Validity of statistics results

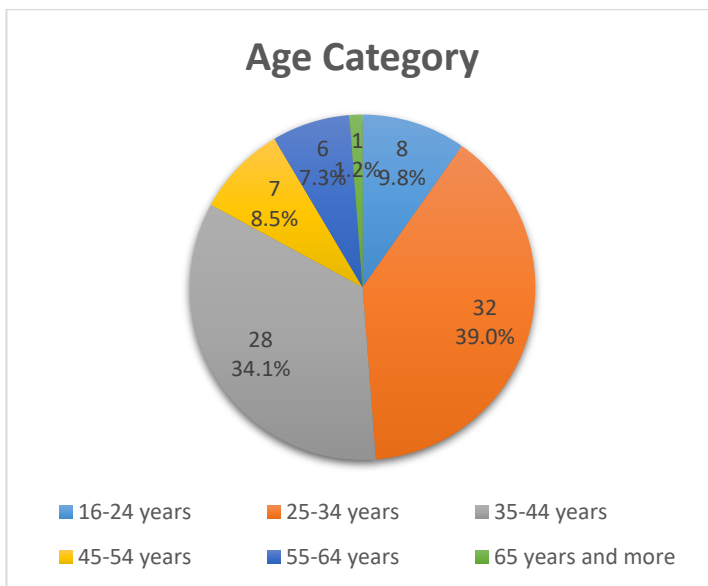
Correlations<sup>a</sup>

	Value	Sig.
Pearson's R	1.000	.000
Kendall's tau	.944	.000

a. Correlations between observed and estimated preferences

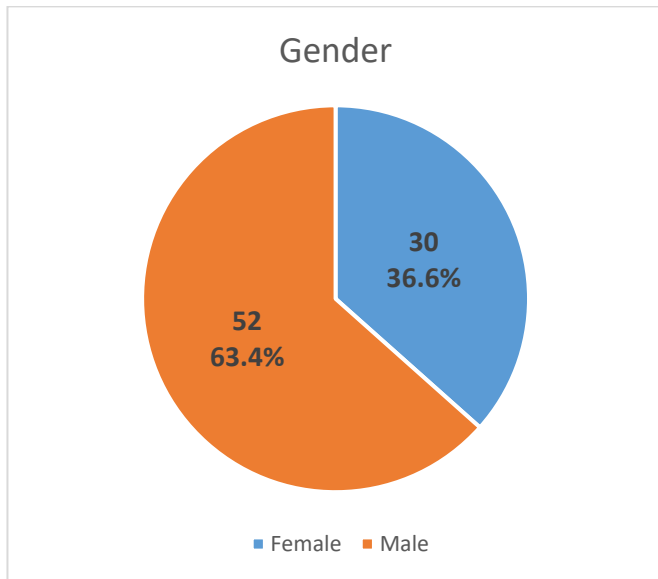
## Appendix E: Statistics results of socio-economic data

1. Which category below includes your age?



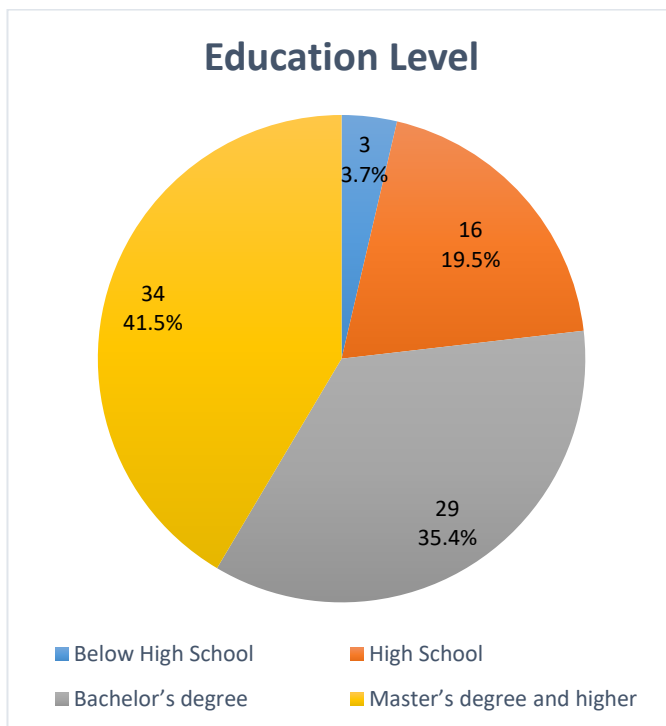
Age	Count
16-24 years	8
25-34 years	32
35-44 years	28
45-54 years	7
55-64 years	6
65 years and more	1

## 2. What is your gender?



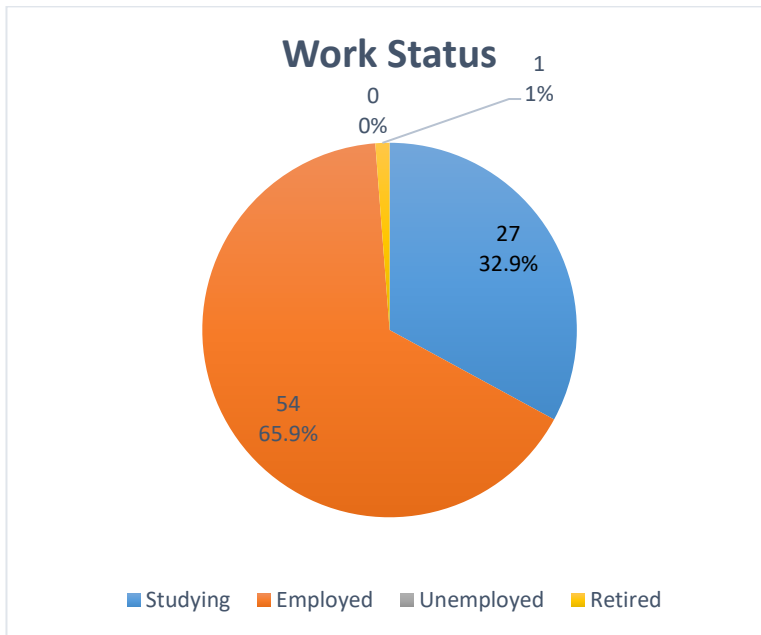
Gender	Amount
Female	30
Male	52

## 3. What is the highest degree or level of education you have completed?



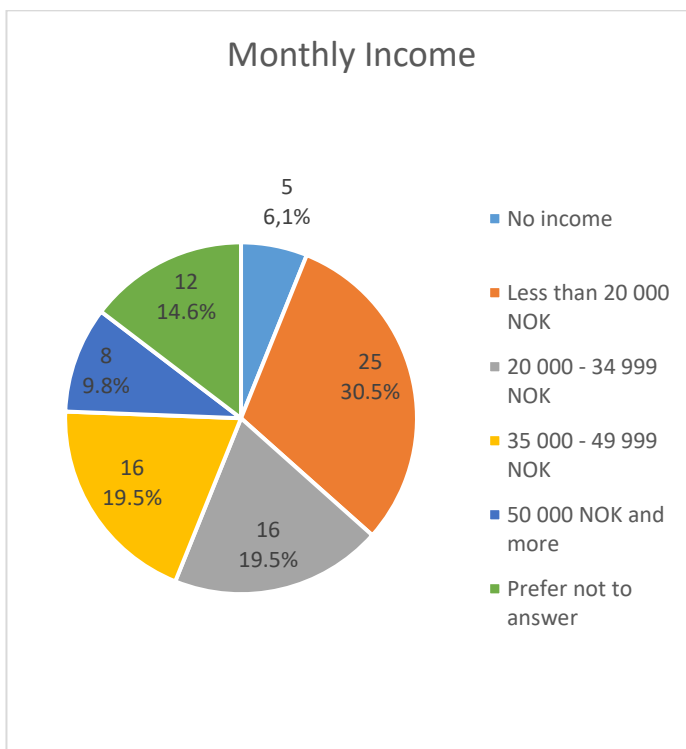
Education Level	Amount
Below High School	3
High School	16
Bachelor's degree	29
Master's degree and higher	34

#### 4. What is your work status?



Work Status	Amount
Studying	27
Employed	54
Unemployed	0
Retired	1

#### 5. What is your monthly income?



Income	Amount
No income	5
Less than 20 000 NOK	25
20 000 - 34 999 NOK	16
35 000 - 49 999 NOK	16
50 000 NOK and more	8
Prefer not to answer	12



# Appendix F: Statistics results of different groups

## 1. 16-24 years

### Utilities

		Utility Estimate	Std. Error
Location	Mailbox	.056	.048
	Home	.264	.048
	Pick-up point	-.319	.048
Speed	Express (1-2 working days)	.396	.036
	Standard (3-7 working days)	-.396	.036
Delivery_Cost	Free (0 NOK)	.514	.048
	1-50 NOK	-.111	.048
	51-100 NOK	-.403	.048
Return_Cost	Free (0 NOK)	.472	.048
	1-50 NOK	-.069	.048
	51-100 NOK	-.403	.048
(Constant)		5.146	.036

### Importance Values

Location	18.421
Speed	25.000
Delivery_Cost	28.947
Return_Cost	27.632

Averaged Importance Score

### Correlations<sup>a</sup>

	Value	Sig.
Pearson's R	.999	.000
Kendall's tau	.986	.000

a. Correlations between observed and estimated preferences

## 2. 25-34 years

Utilities		Utility Estimate	Std. Error
Location	Mailbox	.222	.018
	Home	.410	.018
	Pick-up point	-.632	.018
Speed	Express (1-2 working days)	.341	.014
	Standard (3-7 working days)	-.341	.014
Delivery_Cost	Free (0 NOK)	1.035	.018
	1-50 NOK	-.215	.018
	51-100 NOK	-.819	.018
Return_Cost	Free (0 NOK)	.649	.018
	1-50 NOK	-.247	.018
	51-100 NOK	-.403	.018
(Constant)		4.174	.014

Importance Values	
Location	22.497
Speed	14.736
Delivery_Cost	40.045
Return_Cost	22.722

Averaged Importance Score

Correlations <sup>a</sup>		
	Value	Sig.
Pearson's R	1.000	.000
Kendall's tau	1.000	.000

a. Correlations between observed and estimated preferences

## 3. 35-44 years

Utilities		Utility Estimate	Std. Error
Location	Mailbox	-.025	.078
	Home	.346	.078
	Pick-up point	-.321	.078
Speed	Express (1-2 working days)	.213	.059
	Standard (3-7 working days)	-.213	.059
Delivery_Cost	Free (0 NOK)	.926	.078
	1-50 NOK	-.247	.078
	51-100 NOK	-.679	.078
Return_Cost	Free (0 NOK)	.642	.078
	1-50 NOK	-.235	.078
	51-100 NOK	-.407	.078
(Constant)		4.052	.059

Importance Values	
Location	17.792
Speed	11.367
Delivery_Cost	42.834
Return_Cost	28.007

Averaged Importance Score

Correlations <sup>a</sup>		
	Value	Sig.
Pearson's R	.998	.000
Kendall's tau	.972	.000

a. Correlations between observed and estimated preferences

#### 4. 45-54 years

Utilities			
		Utility Estimate	Std. Error
Location	Mailbox	-.056	.064
	Home	.278	.064
	Pick-up point	-.222	.064
Speed	Express (1-2 working days)	.417	.048
	Standard (3-7 working days)	-.417	.048
Delivery_Cost	Free (0 NOK)	1.000	.064
	1-50 NOK	-.278	.064
	51-100 NOK	-.722	.064
Return_Cost	Free (0 NOK)	.111	.064
	1-50 NOK	-.333	.064
	51-100 NOK	.222	.064
(Constant)		4.417	.048

Importance Values	
Location	13.846
Speed	23.077
Delivery_Cost	47.692
Return_Cost	15.385

Averaged Importance Score

Correlations <sup>a</sup>		
	Value	Sig.
Pearson's R	.999	.000
Kendall's tau	1.000	.000

a. Correlations between observed and estimated preferences

## 5. 55-64 years

### Utilities

		Utility Estimate	Std. Error
Location	Mailbox	.056	.321
	Home	.278	.321
	Pick-up point	-.333	.321
Speed	Express (1-2 working days)	.417	.241
	Standard (3-7 working days)	-.417	.241
Delivery_Cost	Free (0 NOK)	1.000	.321
	1-50 NOK	-.444	.321
	51-100 NOK	-.556	.321
Return_Cost	Free (0 NOK)	.944	.321
	1-50 NOK	-.056	.321
	51-100 NOK	-.889	.321
(Constant)		4.361	.241

### Importance Values

Location	12.644
Speed	17.241
Delivery_Cost	32.184
Return_Cost	37.931

Averaged Importance Score

### Correlations<sup>a</sup>

	Value	Sig.
Pearson's R	.981	.000
Kendall's tau	.889	.000

a. Correlations between observed and estimated preferences

## 6. 65 years and more

### Utilities

		Utility Estimate	Std. Error
Location	Mailbox	-.667	.577
	Home	.000	.577
	Pick-up point	.667	.577
Speed	Express (1-2 working days)	.250	.433
	Standard (3-7 working days)	-.250	.433
Delivery_Cost	Free (0 NOK)	-.333	.577
	1-50 NOK	.000	.577
	51-100 NOK	.333	.577
Return_Cost	Free (0 NOK)	.333	.577
	1-50 NOK	.000	.577
	51-100 NOK	-.333	.577
(Constant)		4.917	.433

Importance Values	
Location	42.105
Speed	15.789
Delivery_Cost	21.053
Return_Cost	21.053

Averaged Importance Score

Correlations <sup>a</sup>		
	Value	Sig.
Pearson's R	.866	.001
Kendall's tau	.800	.005

a. Correlations between observed and estimated preferences

## 7. Females

Utilities			
		Utility Estimate	Std. Error
Location	Mailbox	.092	.046
	Home	.356	.046
	Pick-up point	-.448	.046
Speed	Express (1-2 working days)	.284	.035
	Standard (3-7 working days)	-.284	.035
Delivery_Cost	Free (0 NOK)	1.138	.046
	1-50 NOK	-.287	.046
	51-100 NOK	-.851	.046
Return_Cost	Free (0 NOK)	.632	.046
	1-50 NOK	-.333	.046
	51-100 NOK	-.299	.046
(Constant)		4.089	.035

Importance Values	
Location	18.592
Speed	13.147
Delivery_Cost	45.950
Return_Cost	22.311

Averaged Importance Score

Correlations <sup>a</sup>		
	Value	Sig.
Pearson's R	1.000	.000
Kendall's tau	.986	.000

a. Correlations between observed and estimated preferences

## 8. Males

**Utilities**

		Utility Estimate	Std. Error
Location	Mailbox	.070	.083
	Home	.344	.083
	Pick-up point	-.414	.083
Speed	Express (1-2 working days)	.330	.062
	Standard (3-7 working days)	-.330	.062
Delivery_Cost	Free (0 NOK)	.802	.083
	1-50 NOK	-.205	.083
	51-100 NOK	-.597	.083
Return_Cost	Free (0 NOK)	.593	.083
	1-50 NOK	-.146	.083
	51-100 NOK	-.447	.083
(Constant)		4.376	.062

**Importance Values**

Location	19.661
Speed	17.119
Delivery_Cost	36.271
Return_Cost	26.949

Averaged Importance Score

**Correlations<sup>a</sup>**

	Value	Sig.
Pearson's R	.998	.000
Kendall's tau	.889	.000

a. Correlations between observed and estimated preferences

## 9. Below high school

**Utilities**

		Utility Estimate	Std. Error
Location	Mailbox	-.222	.289
	Home	-.056	.289
	Pick-up point	.278	.289
Speed	Express (1-2 working days)	.292	.217
	Standard (3-7 working days)	-.292	.217
Delivery_Cost	Free (0 NOK)	.444	.289
	1-50 NOK	-.222	.289
	51-100 NOK	-.222	.289
Return_Cost	Free (0 NOK)	.278	.289
	1-50 NOK	.278	.289
	51-100 NOK	-.556	.289
(Constant)		5.458	.217

Importance Values	
Location	19.355
Speed	22.581
Delivery_Cost	25.806
Return_Cost	32.258

Averaged Importance Score

Correlations <sup>a</sup>		
	Value	Sig.
Pearson's R	.948	.000
Kendall's tau	.875	.001

a. Correlations between observed and estimated preferences

## 10. High School

Utilities			Utility Estimate	Std. Error
Location	Mailbox		-.207	.257
	Home		.326	.257
	Pick-up point		-.119	.257
Speed	Express (1-2 working days)		.322	.192
	Standard (3-7 working days)		-.322	.192
Delivery_Cost	Free (0 NOK)		.704	.257
	1-50 NOK		-.274	.257
	51-100 NOK		-.430	.257
Return_Cost	Free (0 NOK)		.393	.257
	1-50 NOK		-.074	.257
	51-100 NOK		-.319	.257
(Constant)			4.878	.192

Importance Values	
Location	17.647
Speed	21.324
Delivery_Cost	37.500
Return_Cost	23.529

Averaged Importance Score

Correlations <sup>a</sup>		
	Value	Sig.
Pearson's R	.968	.000
Kendall's tau	.761	.002

a. Correlations between observed and estimated preferences

## 11. Bachelor's degree

**Utilities**

		Utility Estimate	Std. Error
Location	Mailbox	.115	.053
	Home	.276	.053
	Pick-up point	-.391	.053
Speed	Express (1-2 working days)	.397	.040
	Standard (3-7 working days)	-.397	.040
Delivery_Cost	Free (0 NOK)	.862	.053
	1-50 NOK	-.276	.053
	51-100 NOK	-.586	.053
Return_Cost	Free (0 NOK)	.506	.053
	1-50 NOK	-.207	.053
	51-100 NOK	-.299	.053
(Constant)		4.247	.040

**Importance Values**

Location	17.957
Speed	21.362
Delivery_Cost	39.009
Return_Cost	21.672

Averaged Importance Score

**Correlations<sup>a</sup>**

	Value	Sig.
Pearson's R	.999	.000
Kendall's tau	1.000	.000

a. Correlations between observed and estimated preferences

## 12. Master's degree and higher

**Utilities**

		Utility Estimate	Std. Error
Location	Mailbox	.190	.000
	Home	.444	.000
	Pick-up point	-.634	.000
Speed	Express (1-2 working days)	.240	.000
	Standard (3-7 working days)	-.240	.000
Delivery_Cost	Free (0 NOK)	1.101	.000
	1-50 NOK	-.183	.000
	51-100 NOK	-.918	.000
Return_Cost	Free (0 NOK)	.807	.000
	1-50 NOK	-.310	.000
	51-100 NOK	-.497	.000
(Constant)		3.956	.000



Importance Values	
Location	22.088
Speed	9.839
Delivery_Cost	41.365
Return_Cost	26.707

Averaged Importance Score

Correlations <sup>a</sup>		
	Value	Sig.
Pearson's R	1.000	.
Kendall's tau	1.000	.000

a. Correlations between observed and estimated preferences

### 13. Studying

Utilities			
		Utility Estimate	Std. Error
Location	Mailbox	.407	.164
	Home	.333	.164
	Pick-up point	-.741	.164
Speed	Express (1-2 working days)	.287	.123
	Standard (3-7 working days)	-.287	.123
Delivery_Cost	Free (0 NOK)	.951	.164
	1-50 NOK	-.284	.164
	51-100 NOK	-.667	.164
Return_Cost	Free (0 NOK)	.654	.164
	1-50 NOK	-.284	.164
	51-100 NOK	-.370	.164
(Constant)		4.040	.123

Importance Values	
Location	26.308
Speed	13.154
Delivery_Cost	37.058
Return_Cost	23.479

Averaged Importance Score

Correlations <sup>a</sup>		
	Value	Sig.
Pearson's R	.994	.000
Kendall's tau	.889	.000

a. Correlations between observed and estimated preferences

## 14. Employed

### Utilities

		Utility Estimate	Std. Error
Location	Mailbox	-.079	.152
	Home	.363	.152
	Pick-up point	-.284	.152
Speed	Express (1-2 working days)	.329	.114
	Standard (3-7 working days)	-.329	.114
Delivery_Cost	Free (0 NOK)	.934	.152
	1-50 NOK	-.214	.152
	51-100 NOK	-.720	.152
Return_Cost	Free (0 NOK)	.588	.152
	1-50 NOK	-.182	.152
	51-100 NOK	-.406	.152
(Constant)		4.380	.114

### Importance Values

Location	16.383
Speed	16.626
Delivery_Cost	41.849
Return_Cost	25.142

### Correlations<sup>a</sup>

	Value	Sig.
Pearson's R	.993	.000
Kendall's tau	.930	.000

Averaged Importance Score

a. Correlations between observed and estimated preferences

## 15. Retired

### Utilities

		Utility Estimate	Std. Error
Location	Mailbox	-.667	.577
	Home	.000	.577
	Pick-up point	.667	.577
Speed	Express (1-2 working days)	.250	.433
	Standard (3-7 working days)	-.250	.433
Delivery_Cost	Free (0 NOK)	-.333	.577
	1-50 NOK	.000	.577
	51-100 NOK	.333	.577
Return_Cost	Free (0 NOK)	.333	.577
	1-50 NOK	.000	.577
	51-100 NOK	-.333	.577
(Constant)		4.917	.433

Importance Values	
Location	42.105
Speed	15.789
Delivery_Cost	21.053
Return_Cost	21.053

Averaged Importance Score

Correlations <sup>a</sup>		
	Value	Sig.
Pearson's R	.866	.001
Kendall's tau	.800	.005

a. Correlations between observed and estimated preferences

## 16. No income

Utilities			
		Utility Estimate	Std. Error
Location	Mailbox	.333	.192
	Home	.600	.192
	Pick-up point	-.933	.192
Speed	Express (1-2 working days)	.250	.144
	Standard (3-7 working days)	-.250	.144
Delivery_Cost	Free (0 NOK)	1.200	.192
	1-50 NOK	-.333	.192
	51-100 NOK	-.867	.192
Return_Cost	Free (0 NOK)	.933	.192
	1-50 NOK	-.067	.192
	51-100 NOK	-.867	.192
(Constant)		3.917	.144

Importance Values	
Location	25.989
Speed	8.475
Delivery_Cost	35.028
Return_Cost	30.508

Averaged Importance Score

Correlations <sup>a</sup>		
	Value	Sig.
Pearson's R	.995	.000
Kendall's tau	1.000	.000

a. Correlations between observed and estimated preferences

### 17. Less than 20 000 NOK

#### Utilities

		Utility Estimate	Std. Error
Location	Mailbox	.396	.046
	Home	.262	.046
	Pick-up point	-.658	.046
Speed	Express (1-2 working days)	.353	.035
	Standard (3-7 working days)	-.353	.035
Delivery_Cost	Free (0 NOK)	1.236	.046
	1-50 NOK	-.351	.046
	51-100 NOK	-.884	.046
Return_Cost	Free (0 NOK)	.836	.046
	1-50 NOK	-.431	.046
	51-100 NOK	-.404	.046
(Constant)		3.900	.035

#### Importance Values

Location	20.466
Speed	13.731
Delivery_Cost	41.192
Return_Cost	24.611

Averaged Importance Score

#### Correlations<sup>a</sup>

	Value	Sig.
Pearson's R	1.000	.000
Kendall's tau	.986	.000

a. Correlations between observed and estimated preferences

### 18. 20 000 – 34 999 NOK

#### Utilities

		Utility Estimate	Std. Error
Location	Mailbox	-.127	.220
	Home	.206	.220
	Pick-up point	-.079	.220
Speed	Express (1-2 working days)	.131	.165
	Standard (3-7 working days)	-.131	.165
Delivery_Cost	Free (0 NOK)	.540	.220
	1-50 NOK	-.175	.220
	51-100 NOK	-.365	.220
Return_Cost	Free (0 NOK)	.254	.220
	1-50 NOK	.040	.220
	51-100 NOK	-.294	.220
(Constant)		4.821	.165

Location	16.279
Speed	12.791
Delivery_Cost	44.186
Return_Cost	26.744

Averaged Importance Score

	Value	Sig.
Pearson's R	.953	.000
Kendall's tau	.873	.001

a. Correlations between observed and estimated preferences

## 19. 35 000 – 49 999 NOK

		Utility Estimate	Std. Error
Location	Mailbox	.014	.204
	Home	.139	.204
	Pick-up point	-.153	.204
Speed	Express (1-2 working days)	.349	.153
	Standard (3-7 working days)	-.349	.153
Delivery_Cost	Free (0 NOK)	.826	.204
	1-50 NOK	-.153	.204
	51-100 NOK	-.674	.204
Return_Cost	Free (0 NOK)	.556	.204
	1-50 NOK	-.069	.204
	51-100 NOK	-.486	.204
(Constant)		4.432	.153

Location	8.260
Speed	19.764
Delivery_Cost	42.478
Return_Cost	29.499

Averaged Importance Score

	Value	Sig.
Pearson's R	.985	.000
Kendall's tau	.899	.000

a. Correlations between observed and estimated preferences

## 20. 50 000 NOK and more

### Utilities

		Utility Estimate	Std. Error
Location	Mailbox	-.167	.024
	Home	.708	.024
	Pick-up point	-.542	.024
Speed	Express (1-2 working days)	.594	.018
	Standard (3-7 working days)	-.594	.018
Delivery_Cost	Free (0 NOK)	1.292	.024
	1-50 NOK	-.417	.024
	51-100 NOK	-.875	.024
Return_Cost	Free (0 NOK)	.500	.024
	1-50 NOK	-.208	.024
	51-100 NOK	-.292	.024
(Constant)		4.135	.018

### Importance Values

Location	23.166
Speed	22.008
Delivery_Cost	40.154
Return_Cost	14.672

Averaged Importance Score

### Correlations<sup>a</sup>

	Value	Sig.
Pearson's R	1.000	.000
Kendall's tau	.986	.000

a. Correlations between observed and estimated preferences

## 21. Prefer not to answer

### Utilities

		Utility Estimate	Std. Error
Location	Mailbox	-.204	.096
	Home	.630	.096
	Pick-up point	-.426	.096
Speed	Express (1-2 working days)	.236	.072
	Standard (3-7 working days)	-.236	.072
Delivery_Cost	Free (0 NOK)	.491	.096
	1-50 NOK	-.009	.096
	51-100 NOK	-.481	.096
Return_Cost	Free (0 NOK)	.546	.096
	1-50 NOK	-.315	.096
	51-100 NOK	-.231	.096
(Constant)		4.431	.072

Importance Values	
Location	31.405
Speed	14.050
Delivery_Cost	28.926
Return_Cost	25.620

Averaged Importance Score

Correlations <sup>a</sup>		
	Value	Sig.
Pearson's R	.996	.000
Kendall's tau	.986	.000

a. Correlations between observed and estimated preferences

## Appendix G: Syntax formulation for Conjoint Analysis

```

CONJOINT PLAN='\Users\47408\Desktop\Orthogonal.sav'
/SCORE=Pref1 TO Pref9
/SUBJECT=ID
/FACTORS=Location(DISCRETE) Speed(DISCRETE) Delivery_Cost(DISCRETE)
Return_Cost(DISCRETE)
/PRINT=SUMMARYONLY
/PLOT=SUMMARY
/UTILITY='\Users\47408\Desktop\Output3.sav'

```

## Appendix H: Syntax formulation for simulation analysis

```

CONJOINT PLAN='\Users\47408\Desktop\Orthogonalsim.sav'
/SCORE=Pref1 TO Pref9
/SUBJECT=ID
/FACTORS=Location(DISCRETE) Speed(DISCRETE) Delivery_Cost(DISCRETE)
Return_Cost(DISCRETE)
/PRINT=SIMULATION

```