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The Effects of Sustainable Practices on Customer-Based Brand Equity

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The effects of sustainable practices on Customer-Based Brand Equity

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Abstract
The purpose of this research was to investigate the relation between sustainable practices throughout the supply chain and the value of a brand from a consumer's point of view. Previous research in this area focused mainly on the connection between green trust, green brand image and green brand equity and were limited of scope.

This research was a survey questionnaire conducted in Finland and the unit of analysis was the sports apparel consumer. The survey was spread on Finnish discussion forums to reach a broad audience and obtain a representative sample. Likewise, the research method was similar to other studies focusing on brand equity. Moreover, the brand equity part of the survey was designed based on previous research done in the field, and consumer bias towards sportswear brands was eliminated because an abstract brand was used.

The main contribution of this study was a new insight in various sustainable practices and how they relate to the value of a brand. Moreover, this research showed that, for consumers with high sustainability concern, sustainable procurement, sustainable production and reverse logistics led to increased levels of brand equity of a sustainable brand. For males, sustainable packaging is also positively related with brand equity. Additionally, this study showed that the green market is growing as the green consumer is no longer just a middle-aged female, who has an above average income and education.

This study also filled a gap in the literature because previously no study exploring the relation between sustainable practices and brand equity had been conducted. Moreover, studies in the past assumed that a positive relation existed between sustainable practices and brand image but this relation was never studied in detail until now.

Keywords
customer-based brand equity, sustainability, green consumer

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1 INTRODUCTION

Sustainability has been gaining popularity in recent years. Some of the reasons for this gain in popularity are, per Peattie and Charter (2003, 731–734), the change in consumer opinions and attitudes, pressure groups, media interest, political and legal interest, investor pressure, green taxes, competitors, and the threat of substitution. Despite these drivers for more green products and services many companies are still hesitant to invest in greening their business; often due to the high short-term cost and a short-term vision. It is therefore important to get a better insight in how sustainable practices can help increase the value of a brand.

Chen (2009, 316) established a positive relationship between green brand image, green satisfaction, green trust and green brand equity; the former three are the drivers of the latter. His study was a survey questionnaire which was conducted in Taiwan regarding information and electronic products but used only limited and broad questions regarding brand equity. Moreover, the participants were not representative of the population as they were all students, and his survey was limited in terms of measuring brand equity. He notes that more research needs to be done over a longer period and in different industries and nations. In contrast, this research will focus more on the effects of different aspects of sustainability in general on brand equity. While it can be assumed, from Chen's results that there is a statistically significant positive correlation between some aspects of sustainability and brand equity this study is intended to go deeper than just determining broad linkages and as such will offer additional insights in the relation between different aspects of sustainability and brand equity.

From a managerial point of view this research is an important step to determining whether sustainability efforts like reverse logistics and sustainable products through, for instance Design for Environment (DfE), do in fact increase brand equity. Moreover, if indeed a statistically significant positive relation exists between certain aspects of sustainability and brand equity, the results of this research can be used to convince important stakeholders of the need for increased sustainability efforts and to justify increased short-term costs associated with such efforts. After all, brand equity measures the value of a brand. Finally, if such a statistically significant positive relation does exist,

it might move companies away from green washing (using green marketing to deceive the consumer into believing the company's action are environmentally friendly while in fact they are not) and motivate them to embrace true sustainability instead. Sustainability is often seen as costly, and companies focused on short-term objectives like maximizing profit and return on investment, have difficulties justifying the extra costs of moving towards a sustainable long-term strategy. It should be noted that there is one possible pitfall; if a firm cherry picks those aspects of sustainability that do indeed prove to have a positive correlation with brand equity then the question becomes whether that company is green washing or making truly sustainable decisions. However, focusing on those aspects that offer the biggest gains first does make sense from a business perspective, and helps gain leverage with important stakeholders.

From a personal point of view the results of this research are very interesting. Sustainability is an issue that is both interesting and important. With current rates of greenhouse emissions and the associated threats of pollution and global warming, it is important that companies focus on becoming more sustainable. Moreover, many scientists are warning that certain areas of the earth will become near inhabitable over the coming decades and that the numbers of environmental refugees will increase dramatically. Similarly, natural resources are depleting, as more is taken from the earth's core than that it can create. Increased reuse and recycling of materials are therefore a necessity as well as a reduction of material intensity in general. Consequently, this research is an important step in getting a better insight in how sustainable practices throughout the supply chain influence brand equity.

In the past, research has already established a connection between green marketing and green brand equity. As mentioned earlier, Chen (2009, 316) previously established that a positive relation exists between green brand image and green brand equity. However, his research did not explore how sustainability efforts affect brand image. Nazari, Ghasemi and Saeidi's (2015, 492) research showed similar results but again this research did not explore the sustainability factors that affect brand image. Additionally, sustainability research has mostly focused on dividing the factors in three distinct groups: social, economic, and environmental. This research in contrast will focus on sustainability efforts all along the supply chain instead, and will try to determine the effect increased sustainability efforts, such as sustainable packaging or

sustainable logistics, have on brand equity. Thus, this research will take a different approach from previous studies. Moreover, it will go beyond simply establishing a connection between green brand image and green brand equity.

Thus, the aim of this research is to test the relationship between sustainable practices and brand equity to establish whether there is a statistically significant positive relation. Additionally, this research tries to explore the relationship between specific demographics and sustainability. For instance, do males and females differ in their evaluation of sustainable practices. Many studies in the past have already tried to establish such a relationship with contradictory results. For instance, Rokka and Uusitalo (2008, 522–523) concluded that consumers who care about the environment are no longer just highly educated and possess a high disposable income as previously thought. Thus, more insight in the sustainable consumer is necessary.

Concludingly, if a significant positive relation between sustainable practices and brand equity does indeed exit, it might motivate businesses to increase their sustainability efforts and develop greener products and services. However, this research focuses fully on the marketing of products, and services are not part of the scope. Additionally, the survey is limited to Finnish consumers in the sportswear and apparel sector. Finally, developing a way to measure brand equity from scratch is not part of the scope. As such, its measurement will be based on previous research.

2 THEORETICAL FRAMEWORK

2.1 Customer-based brand equity

To be able to discuss brand equity, it is important to understand what a brand is. Aaker (1991, 7) defines a brand as “a distinguishing name and/or symbol (such as a logo, trademark, or package design) intended to identify the goods or services of either one seller or a group of sellers, and to differentiate those goods or services from those of competitors.” Thus, a brand differentiates a product in one way or another from the products of competitors. Because of its ability to differentiate, brands have intrinsic value, or in other words brand equity.

While there is no generally accepted definition of brand equity, it can be approached either from a financial or customer point of view. The former analyses brand equity as the financial value of a brand, while the latter evaluates brand equity in terms of customer perceptions and is generally referred to as customer-based brand equity (CBBE) (Christodoulides & De Chernatony 2009, 5–6). This research focuses on the customer based definition of brand equity.

There are two predominant definitions of CBBE. Keller (1993, 2) defines CBBE as “the differential effect of brand knowledge on consumer response to the marketing of the brand.” Aaker (1991, 15–16; 1996, 7–8) on the other hand argues that brand equity is a “set of brand assets and liabilities linked to a brand, its name and symbol, that add to or subtract from the value provided by a product or service to a firm and/or to that firm’s customers.” While both authors approach brand equity from a customer point of view, they nevertheless have a different approach. Aaker (1991, 16) identifies brand name awareness, brand loyalty, perceived quality, brand associations, and other proprietary brand assets as main antecedents, or categories of assets, of brand equity. On the other hand, Keller (1993, 3) finds that brand knowledge is the main antecedent of brand equity which in turn is driven by brand awareness and brand image. While at first glance these two methods seem very dissimilar there is however a lot of overlap between the two. To conclude, Aaker’s definition of brand equity is more encompassing while Keller’s definition focuses purely on the consumer point of view. The next chapters will discuss the antecedents of brand equity in more detail.

Per Keller (2013, 108) CBBE can also be depicted as a pyramid, the brand resonance model, consisting of six building blocks, salience, performance, imagery, judgements, feelings, and resonance that together determine the strength of a brand, and only those brands that make it to the top of the pyramid have considerable brand equity (Figure 1).

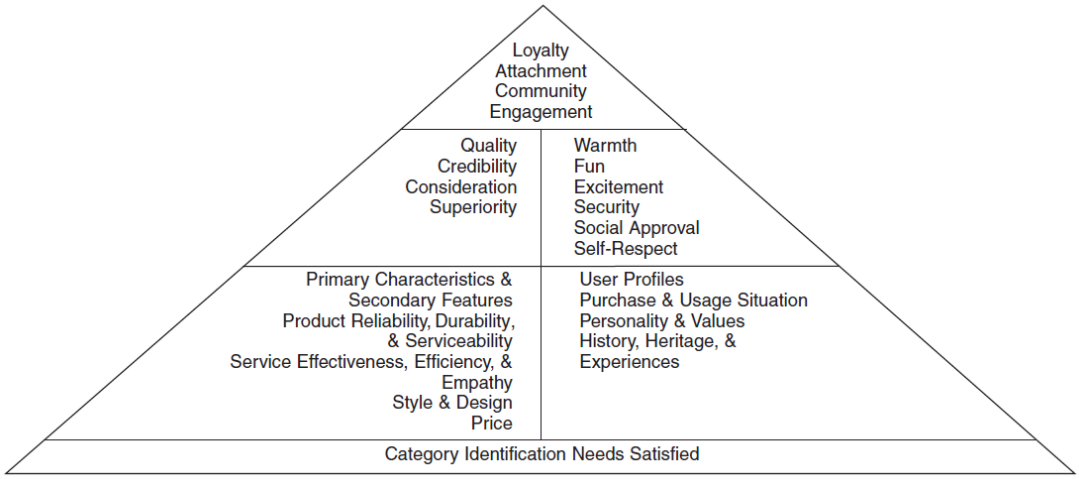

Figure 1. Customer-based brand equity pyramid (Keller 2001, 7)

Keller (2013, 107–108) states that at the lowest level consumers are aware of the brand, and the brand can satisfy their needs. At the next level the brand's performance, for instance in terms of price, reliability, ingredients, features, matches the consumer's expectations and the extrinsic product properties appeal to them (Keller 2013, 111–113). At the third level consumers make judgements about the brand, like brand quality and credibility, and develop feelings for the brand (Keller 2013, 117–119). At the final stage, the top of the pyramid, Keller (2013, 120) claims that consumers feel "in synch" with the brand and are increasingly loyal and the frequency of their purchases increases. Thus, brands that can connect deeply with their customers and instil loyalty will have high levels of brand equity.

2.1.1 Brand awareness

Aaker (1991, 61) defines brand awareness as "the ability of a potential buyer to recognize or recall that a brand is a member of a certain product category."

Brand recall is always associated with a product category; for instance, the ability of a consumer to recall the brand Coca Cola when thinking about carbonated beverages. While Keller (2013, 72) assesses brand equity from a psychology point of view, his definition of brand awareness is like Aaker's; given different circumstances, the aptitude of a consumer to identify the brand. Keller (ibid.), also identifies brand recall and brand recognition as the two aspects that determine brand awareness. Brand recall and brand recognition are important under various circumstances. Keller argues (2013, 74) that brand recall is important in cases where consumers make their purchase decision prior to going to the "point of purchase" while recognition is important when they make the purchase decisions at the "point of purchase" and thus see the brands displayed. Moreover, in a day and age where ecommerce is booming, brand recall is becoming more important, as finding a product on an ecommerce site usually requires some sort of knowledge of the product beforehand. There are after all no real brands on display. Thus, brand awareness is an important aspect of brand equity.

Brand awareness can be thought of as a pyramid. At the lowest step of the brand awareness pyramid, the customer is totally unaware of the brand (Aaker 1991, 62). Thus, the customer will not recognize nor recall the brand, and is unlikely the make a purchase decision. The next two levels are brand recognition and brand recall, while at the top of the pyramid, the brand is first in the mind of the customer (ibid.). Previously, it was established that brand recall and recognition are important during different stages of the decision to purchase a product. Additionally, Aaker (1991, 65) argues that familiarity with a brand (brand recognition) is often enough for low-involvement products because customers typically will not evaluate the different attributes of these products. However, the buying process often begins with selecting a group of brands to choose from, the so-called consideration set (Aaker 1991, 66). Brand recall plays a crucial role in getting into this consideration set (ibid.). Moreover, Aaker argues (1991, 67) that when customers purchase products they use frequently, like coffee and detergents, brand recall is also crucial because they make the decision which brand to buy before they arrive at the store. Thus, the goal of a brand is to become first in the mind of as many customers as possible at which point a brand will have considerable brand equity.

2.1.2 Brand loyalty

The two main definitions of brand equity diverge when it comes to brand loyalty. Aaker (1991, 39) argues that customer loyalty is often pivotal to brand equity because continued purchases by customers, even in the face of superior products from competitors, means the brand has an implied additional value associated with it. Keller (2013, 69) states that this additional value a brand has, over a non-branded product, constitutes brand equity. Just like with brand awareness, brand loyalty can be depicted as a pyramid. The bottom layer of customers are price sensitive switchers, who have no loyalty to the brand (Aaker 1991, 40). The next level on the loyalty pyramid are buyers who are satisfied and can be classified as habitual buyers, who have no real reason to change to another brand (ibid.). The next layer consists of customers who are also satisfied buyers, but in contrast to the previous group, they have switching costs, either time, money or level of performance associated costs (ibid.) and thus they are less likely to switch to another brand. The fourth layer of customers considers the brand a friend as they are committed emotionally, while the top layer of the pyramid consists of truly committed buyers, who actively promote the brand to others through word of mouth (Aaker 1991, 41). Consequently, the more loyal to a brand customers are, the more likely they are continued customers and thus the higher the brand equity.

Obviously, customers cannot become loyal to a brand unless they have had previous experience with the brand. Thus, Aaker (1991, 41–42) argues that for customers to become loyal to a brand they must first purchase it, and then experience it. Additionally, Aaker (1991, 43) concludes that customers need to be treated as prime brand assets because of the pivotal role that brand loyalty plays in brand equity. Moreover, it is often harder to acquire new customers than to get rid of the current ones because customers value the familiar and are resistant to change (Aaker 1991, 46–49). Thus, a loyal customer base is important for a healthy brand.

Since brand loyalty is pivotal to the success of a brand, it is important to identify its main drivers. Chaudhuri and Holbrook (2001, 83) deduct from their research that brand loyalty is driven by brand affect and brand trust. Brand affect is the ability of a brand to create positive feelings in the mind of the customers when using the brand, while brand trust, on the other hand, relies on

the ability of a brand to fulfil its intended function (Chaudhuri & Holbrook 2001, 82). Subsequently, a brand should elicit positive feelings when it is being used, and should reliably perform its intended function to acquire a loyal customer base.

2.1.3 Perceived quality

It is important to realize that perceived quality is not the same as actual quality. Per Aaker (1991, 85) perceived quality is based on the perception of the customer in relation to the “overall quality, or superiority of a product or service.” Perceived quality is always relative as it is influenced by available alternatives, and the actual purpose of the product (ibid.). Moreover, Aaker (1991, 96) argues that perceived quality is likewise not the same as satisfaction because if expectations are low, a customer can be satisfied with the performance of a product despite its low perceived quality. Similarly, a customer can be dissatisfied with a product despite high perceived quality, merely because the customer’s expectations were high, and the product did not live up to those high expectations.

Keller makes no mention of perceived quality as an antecedent of CBBE. However, as Aaker (1996, 17) points out, perceived quality is such a strong brand association that it is a brand asset on its own. Thus, perceived quality is a brand association, and as such also fits in Keller’s definition of CBBE albeit not in such a prominent role. Brand associations will be described in the next chapter.

Perceived quality offers brands with a range of benefits. Firstly, perceived quality is a prime characteristic of a brand’s positioning, and can be the main reason a customer decides whether to buy a specific brand, or whether a band is even part of the consideration set in the first place (Aaker 1991, 87). Secondly, a brand that has an advantageous perceived quality position can charge a price premium, or offer increased value at a similar price which in turn should attract more customers and increase customer loyalty (ibid.). Aaker (ibid.) also suggests that such a price premium has a perceived quality reaffirming effect. Ultimately, perceived quality affects market share, price,

profitability, and does not lead to increased costs (Aaker 1991, 89). Thus, perceived quality is a strong driver of the success of a brand. It is pivotal in acquiring new customers, and keeping existing customers satisfied and loyal.

It is important to understand the underlying factors that drive perceived quality. Garvin (cited in Aaker 1991, 91) identifies the following seven dimensions of product quality: performance, features, conformance with specifications, reliability, durability, serviceability, and fit and finish. The last dimension, fit and finish, refers to how the quality feels or appears, and is important because customers can judge this dimension, and as such they scrutinize companies on the ability to deliver products that appear to be of high quality (Aaker 1991, 93). Furthermore, Aaker argues (1991, 90) that the importance of these dimensions depends on the product and on the individual customer because each customer perceives quality differently, and each customer has different expectations.

As seen previously, attaining high perceived quality is important. However, as Aaker (1991, 97) points out, high perceived quality is not enough, the product must also actually be of high quality. To judge quality, customers often use visual cues, like the size of a speaker or the blue colour of detergents, as proxy for the more difficult to judge quality dimensions (ibid.). Furthermore, Aaker (1991, 99) identifies both price and brand name as cues or signals for quality. The former is often used when other visible cues are missing. Similarly, Zeithaml (1988, 4) argues that perceived quality is influenced by product attributes as well as the perceived price. This perceived price is the cost to acquire the product, not just the price of the product (Zeithaml 1988, 10). Moreover, Zeithaml (1988, 17) concludes that perceived quality is not static and it changes over time as the result of an increase in competition, additional information, or a change in the expectations of the customer. Consequently, perceived quality is affected by more than just price, nor does perceived quality superiority mean that it is everlasting. As new competitors enter the scene perceived quality might change, and thus customer satisfaction and loyalty might decline.

2.1.4 Brand associations

Customers have certain perceptions and associations of a brand. Moreover, brand associations are all the different thoughts in the mind of a customer in relation to the brand (Aaker 1991, 109). Keller (1993, 3; 2013, 77) argues that the strength, uniqueness and favourability of these associations affects their impact upon brand equity and particularly in the case of purchase decisions which require a lot of involvement from the customer. Hence, strong, unique and favourable associations create strong brands. Per Keller (2013, 77) associations can either be brand attributes, brand benefits or brand attitudes. Brand attributes describe what a product is about and what its intended function is when used (Keller 1993, 4). Brand benefits, on the other hand, are the consumer's personal value of the product; their perception of what the product can achieve for them (ibid.). Finally, brand attitudes concern the consumer's general assessment of a brand and are pivotal in a consumer's brand choice decision (ibid.). These associations are the basis of brand image; a collection of associations reflecting the perceptions of the consumer (Aaker 1991, 109–110; Keller 1993, 3). Hence, brand associations have a direct impact on CBBE, and additionally determine a brand's positioning.

A brand's associations, in relation to those of competitors, form the basis of a brand's positioning; a brand position is always in relation to a frame of reference (Aaker 1991, 110; Keller 2013, 77–78). The positioning of a brand in the mind of a consumer should not be confused with the intended positioning of the brand, or how a brand wants to be perceived. Often brands assume they are positioned correctly due to insufficient knowledge of their brand equity. Correct positioning requires aligning the position of the brand in the consumer's mind with the brand's intended position. Aaker (1991, 110) concludes that brands that aim to have a strong competitive position must score high on an attribute that is desired by the consumer and must make certain the consumers hold strong associations. Finding such an attribute however, that is not held by a competitor yet, is often the main problem of proper positioning (Aaker 1991, 115). Yet, creating these points of difference is pivotal to a brand's success.

Brand associations play an important role in differentiation. Especially in product categories where it is hard to distinguish between products, like wines and

clothes, associations of a brand name can be a major point of differentiation (Aaker 1991, 111). Moreover, such associations can be the source of competitive advantage (ibid.). A difficult to copy point of differentiation can be a major barrier against competition. Additionally, using a competitor as a frame of reference can be an excellent way to establish a proper positioning because ultimately it only matters how well your product fares in comparison to its competition (Aaker 1991, 127). A brand can rarely be seen in a vacuum because there is always some form of competition, even when a brand appears to hold a monopoly position it might still face indirect competition or competition in a broader product category. Keller (2013, 82) argues that brands need to identify multiple frames of references, and not just focus on brands that are in the exact same limited product category. Hence, having a broader frame of reference to identify a larger number of competitors and their corresponding positioning leads to stronger points of differentiation and thus competitive advantage.

2.2 Sustainable practices

In the Brundtland report, the World Commission on Environment and Development (1987, 43) defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. Other authors have further developed the concept of sustainability by creating frameworks, for instance The Natural Step Framework (TNSF) and the Triple Bottom Line (TBL) concept. Moreover, Martin and Schouten (2014, 29) note that the TBL concept revolves around creating a triple win situation for the business, the environment and society. In contrast, TNSF delineates a set of guiding principles, which were designed from a scientific point of view, to attain true sustainability (Martin & Schouten 2014, 31–32). To conclude, the above two frameworks show that sustainability is not only environmental in nature. In that regard the TBL concept differs from TNSF because it also incorporates economic sustainability. On the other hand, Martin and Schouten (2014, 2) argue that TBL might not be sufficient and can possibly be greenwashing. Nevertheless, no matter the framework, companies are taking steps towards becoming more sustainable.

To discuss all the different sustainable practices, a supply chain oriented approach will be used to divide these practices in different aspects conforming to supply chain activities much akin to Emmett and Sood's (2010, 19), and Grant, Trautrims and Wong's (2015, 3) approach. The next six chapters focus on sustainability efforts in procurement, logistics, manufacturing, packaging, reverse logistics, and marketing. The final two chapters are more holistic in nature, and deal with carbon management and corporate social responsibility. The former deals with managing the company's carbon footprint, a term that will be used more often during the next chapters and as such needs further explanation.

Carbon footprint is used extensively throughout literature and most sources do not bother to define the term. However, Peters (2010, 245) argues that the word is difficult to define, and there is no single definition of carbon footprint that is universally accepted. Thus, Peters (ibid.) suggests the following definition: "The 'carbon footprint' of a functional unit is the climate impact under a specified metric that considers all relevant emission sources, sinks, and storage in both consumption and production within the specified spatial and temporal system boundary." This definition appears complex at first glance as it has its roots in Lifecycle Assessment (LCA), which is an engineering approach to determine all the emissions and their impacts. However, to oversimplify, the carbon footprint measures all emissions during the entire lifespan associated with the production, and use, of a given unit of a product. However, Peters (2010, 246) argues that the carbon footprint can be calculated at many different scales, ranging from the product to the global scale. In this research, carbon footprint is solely used on the product or supply chain level.

2.2.1 Procurement

2.2.1.1 Supplier selection and local sourcing

Traditionally procurement was about obtaining the right materials at the right time, of the required quality, from the right supplier, and at the correct price (Emmett & Sood 2010, 60). Consequently, Emmett and Sood (2010, 61–62) argue that procurement was assessed from a risk and a cost perspective only, and products were categorized in four groups: bottleneck, critical, routine and

leverage, with corresponding procurement strategies. From a sustainability point of view these criteria are no longer enough. Additional factors must be considered, for instance the green record of the supplier, the availability of recycled substitutes, and the effect on the carbon footprint of the final product (Emmett & Sood 2010, 63). Grant et al. (2015, 135–138) come to a similar conclusion and further conclude that consumers are often strong drivers for more sustainable procurement practices. Thus, sustainable sourcing requires companies to actively evaluate their suppliers, and select those with the best sustainability record.

There are several methods to selecting suppliers. Hitchcock and Willard (2015, 182) state that a weighted criteria chart is an excellent and relatively inexpensive method of choosing between different products and suppliers. Such a chart consists of different social, environmental, and economic criteria which are then weighted per their importance. Each supplier can then be rated, and consequently the most sustainable suppliers can be chosen.

The exact criteria differ depending on the industry and the company at hand. For instance, Winter and Lasch (2016, 184) identified the following social criteria implemented by a small group of interviewed suppliers in the fashion and apparel industry (in order of most common to least common):

- No child labour
- Working hours
- No forced labour
- No discrimination
- Employment compensation
- Freedom of association
- Health and safety practices
- No disciplinary and security practices
- Employment contract and working permission
- Further ethical and social aspects
- Housing conditions
- Home worker conditions

Additionally, the following three environmental criteria were also implemented (Winter & Lasch 2016, 184): wastewater treatment, use of environmentally friendly material, and carbon and hazardous material management. Many of these criteria are based on codes of conduct, for instance designed by the International Labour Organization (ILO) or legislation. These codes of conducts are discussed in a later chapter.

Producers can also opt for sourcing materials from local suppliers. However, as described in a later chapter, logistics are often only responsible for a small part of the total carbon footprint of a product. On the other hand, legislation, and its enforcement, is much more severe in developed countries and thus production processes often cause less pollution. However, the choice between local suppliers or suppliers in developing countries will need to be subject to rigorous LCA to determine which choice is more sustainable (Grant et al 2015, 146). LCA determines the emissions, and their environmental impact, during the lifecycle of a given product (Hitchcock & Willard 2015, 177–178). Consequently, the use of local sourcing is a double-edged sword that requires further analysis and should not be adopted at face value.

2.2.1.2 Ecolabels

Ecolabels are hallmarks that show an organization's compliance with a certain level of social, economic, and environmental performance (Martin & Schouten 2014, 164). However, not all ecolabels cover all three aspects of sustainability. For instance, the organic ecolabel, like organic cotton, only means products are grown without the use of pesticides and the label does not guarantee a certain level of social conditions under which these crops are grown. In fact, such a label is not a guarantee that the product is, in fact, more sustainable than a similar non-certified product (Clancy, Fröling & Peters 2015, 346). Thus, producers are well advised to not take ecolabels at face value.

Ecolabels are a method of supplier evaluation and selection. However, they offer more validity due to their officially recognized status and often rigorous auditing methods, and are regularly paid for by the supplier (Grant et al. 2015, 138), though this is not always the case. Grant et al. (ibid.) state that ecolabels, such as Fairtrade, Rainforest Alliance and Marine Stewardship Council, are an indication, or proxy, of the sustainability record of a supplier. Moreover, such labels can signal social and environmental dedication to the final consumer and thus influence consumer perceptions. However, not all ecolabels are trustworthy nor enforce rigorous auditing (Martin & Schouten 2014, 166), and great care should be exercised when choosing an ecolabel. Thus, to

truly analyse the sustainability of procured materials and products, ecolabels are not enough.

Ecolabels can also be an opportunity for brands. Martin and Schouten (2014, 164) state that ecolabels are a form of cobranding, and that an ecolabel adds credibility while the sustainable product in turn reinforces the strength of the ecolabel. Thus, producers can choose to solely select suppliers that are certified to make their sustainability claim more credible. Such a label also signals dedication to the sustainability cause to the final consumer.

2.2.1.3 Supplier development and environmental management systems

Once suppliers have been evaluated and consequently selected, producers can opt to help increase their performance through supplier development. Supplier development involves improving the performance and capabilities of a supplier through the efforts of the buying company (Emmett & Sood 2010, 78). Emmett and Sood (2010, 79) argue that choosing to develop those suppliers that deliver critical or bottleneck materials, thus in a situation when there are only few suppliers available, is often a good start. Because supplier development demands a large amount of resources from the producer, only the most promising few suppliers, with the largest impact on sustainability, are worth developing (Emmett & Sood 2010, 80).

Another method to improve the performance of a supplier, when the producer has a strong bargaining position, and thus there are many suppliers but only few buyers, is through the implementation of an environmental management system (EMS). Emmett and Sood (2010, 60) argue that manufacturers often force their suppliers into implementing, and sometimes even certifying, an EMS. EMS includes the ISO 14001 certification, and is usually designed around a “plan-do-check-act” continuous cycle which helps companies plan and pursue environmental improvements in small incremental steps (Grant et al. 2015, 211). This is a continuous improvement approach and does not stop when the goals are achieved but rather continues from the beginning again by identifying new goals. Consequently, these small improvements made by suppliers help improve the carbon footprint of the entire supply chain.

2.2.1.4 Sustainable sourcing and brand equity

It is important to consider the situation in the fashion and apparel industry, which sportswear and apparel belong to. Turker and Altuntas (2014, 847) conclude that companies in the fashion industry increasingly procure their products from developing countries where labour and environmental conditions are worse than in developed countries. Similarly, Macchion, Moretto, Caniato, Caridi, Danese and Vinelli (2015, 176) state that in the fashion and textile apparel industry offshoring is a common phenomenon, and most of the production processes have been shifted to developing countries in Asia, even those processes that are very complex in nature. Thus, social and environmental problems like the use of child and forced labour are likely to influence the perceptions of the customer of the final product. Moreover, consumers are increasingly becoming more interested in the supply chains, and sourcing practices, of multinational companies. De Brito, Carbone and Blanquart (2008, 535) state that due to several sweatshop scandals, among which Nike, the consumers have become more critical of ethical problems in the textile industry. Nike suffered a hefty amount of negative publicity due to the social problems at their suppliers, and there are plenty multinationals which have suffered a similar fate.

Previous research (Chunga, Lee & Heath 2013, 438–439) has already established a strong causal relation between public relations (PR) and brand equity. Moreover, Aaker (1991, 171) states that PR is a relatively cheap method to establish associations and build brand recognition. On the flipside, negative publicity can cause harm to brand equity. Because both associations and brand recognition are antecedents of CBBE, PR, either positive or negative, affects brand equity.

Additionally, Dubey, Gunasekaran, Papadopoulos, Childe, Shibin and Wamba (2016, 8) designed a sustainable supply chain management model based on Total Interpretive Structural Modelling (TISM) and concluded that there is a direct connection between supplier development and green product design (design for environment will discussed in a later chapter), which in turn leads to increased brand equity (Figure 2).

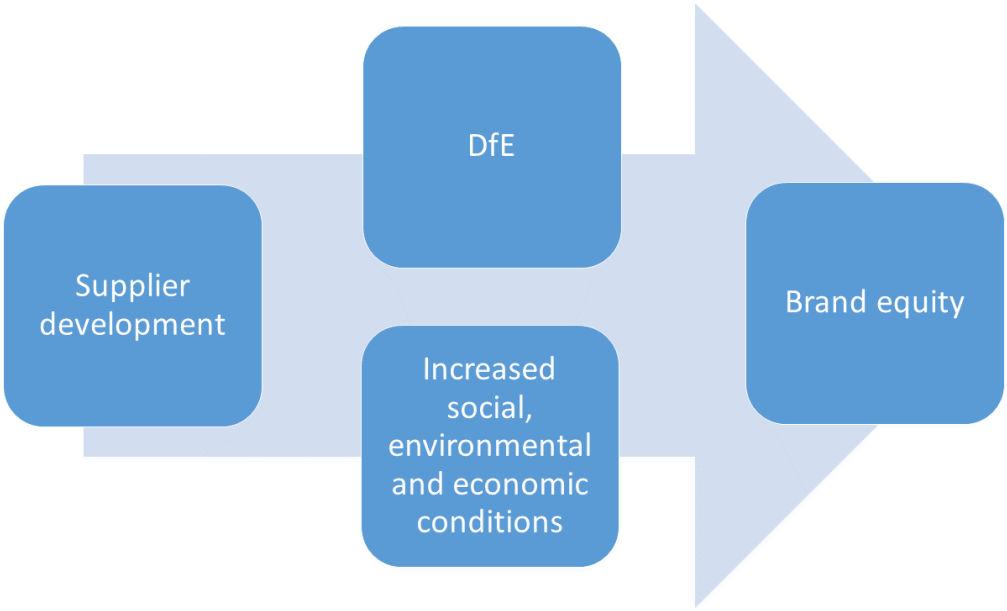

Figure 2. Supplier development leads to increased brand equity

Moreover, Kumar and Rahman (2016, 844) show that incorporating supplier development into the procurement process has a positive effect on the social, economic and environmental performance of a company. Finally, as discussed before, ecolabels are a way to increase the credibility and legitimacy of the sustainability claim and communicate a firm's dedication to sustainability to the consumer. Thus, this research suggests the following hypothesis:

Hypothesis 1 (H_1): For consumers with high sustainability concern, sustainable sourcing is positively related with CBBE.

2.2.2 Logistics

Logistics concerns the efficient purchasing, moving and storing of materials, parts or even completed goods, as well as information, from supplier to the final customer in such a way that the costs for completion of orders are minimized, and short-term as well as long-term profitability is maximized (Christopher 2016, 2). The previous definition makes no real mention of reverse logistics. However, Emmett and Sood (2010, 124) define logistics as managing the transportation of goods from supplier to final customer and vice versa. Thus,

logistics concerns moving materials, parts or finished goods, as well as information, from supplier to the final customer and vice versa in such a way that it minimizes costs and maximizes profitability. Although reverse logistics is technically part of logistics, it will be described separately in a later chapter because it is irrevocably related to waste management.

Similarly, packaging has an impact on logistics because it influences the energy consumption during transit, it affects storage, and it has an impact on product waste (Molina-Besch & Pålsson 2014, 138). However, sustainable packaging will also be discussed in a later chapter on its own.

As seen previously, companies in the fashion and apparel industry have increasingly moved their production to developing countries with increased transportation requirements. Supply chains in general have become progressively more global with freight transport showing vast growth, and this growth in turn has led to ever increasing carbon emissions in the logistics sector (Grant et al. 2015, 53). Thus, logistics is playing an ever-increasing role in today's global supply chains.

The increase in carbon emissions is not without consequence. Pressure is mounting to decarbonize the supply chain as the result of regulations of carbon emissions, volatile fuel prices and changing consumer demand (World Economic Forum 2009, 4). Moreover, most of the carbon emissions in logistics are the result of freight transport (Figure 3), while logistics buildings account for roughly thirteen per cent, and although road transport is responsible for the largest share of Green House Gas (GHG), airfreight nevertheless has the highest CO_{2e} kg per tonne kilometre (World Economic Forum 2009, 8, 11) and is thus the least efficient mode of transport. CO_{2e} kg per tonne kilometre measures the emission of all GHG calculated in carbon dioxide equivalent.

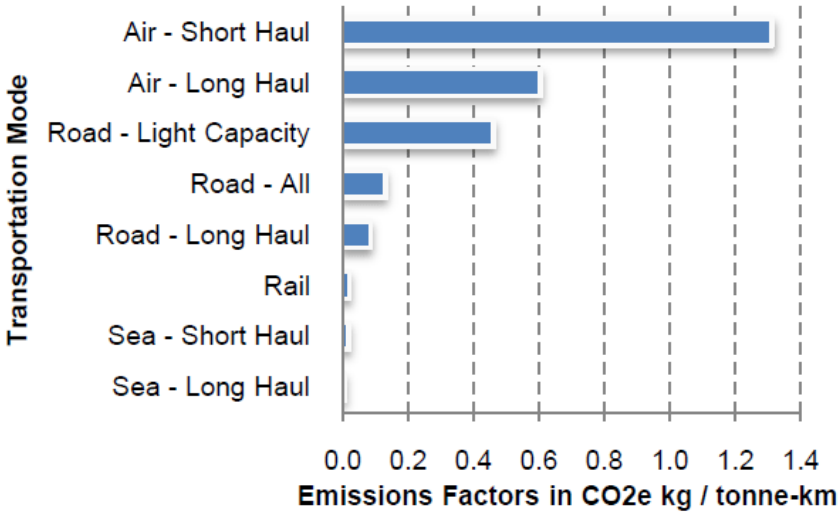

Figure 3. Emission efficiency of different transport modes (World Economic Forum, 8)

Per the World Economic Forum (2009, 11), consumers are striving to become greener, and carbon emissions are their main priority. Unfortunately, information on carbon emissions is sparse and consumers are forced to use proxy indicators instead (ibid.). Research shows that most the consumers in the EU are likely to buy low carbon products. However, and despite the ever-increasing globalization of supply chains, most of the emissions in the textile industry, and most industries in general, are not caused by transportation (Figure 4) and thus nearshoring will have little to no effect, and can in fact be counterproductive (World Economic Forum 2009, 11–12). Similarly, it was concluded in the previous chapter that local sourcing is not always beneficial, and extensive LCA is necessary to determine whether purchasing from local suppliers is indeed more sustainable, because the logistics sector is responsible for a relatively low amount of emissions compared to the rest of the supply chain.

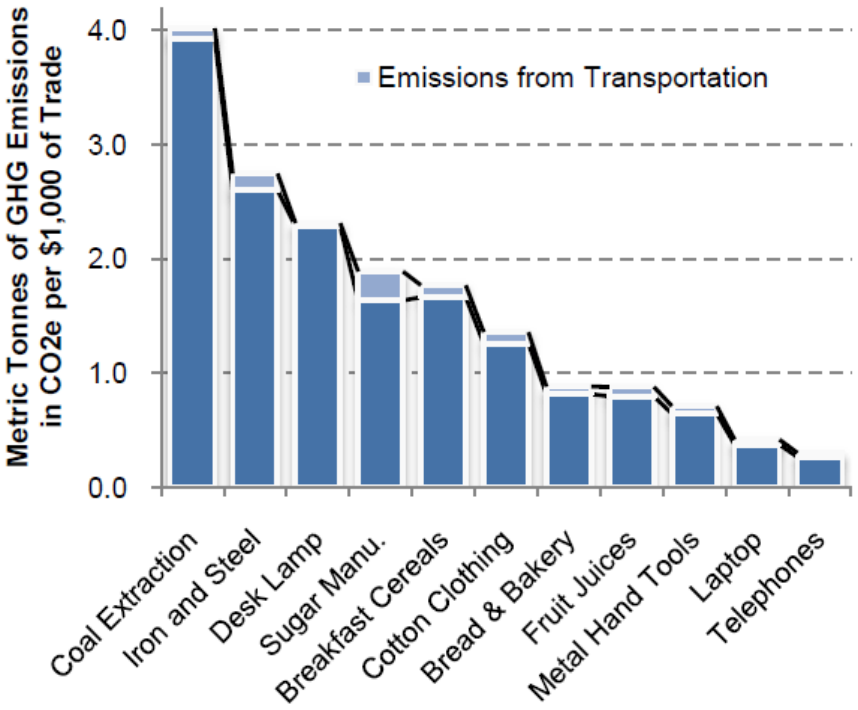

Figure 4. Lifecycle emissions in different industries with transportation emissions in light blue colour (World Economic Forum 2009, 11)

However, the impact of logistics on the environment goes beyond the release of GHG. Other externalities include noise and accidents. Noise has a negative impact on the health of citizens, leading to increased social costs, while accidents involving freight transport tend to be more serious due to the increased weight of the vehicles involved (Grant et al. 2015, 54). Additionally, Grant et al. (2015, 78) argue that warehouses are responsible for increased traffic and thus potentially cause congestion, produce noise, block the earth from absorbing rainwater, disturb wildlife, and cover a lot of land. Thus, when determining the negative impact of a building it is important to look beyond emissions and include all externalities.

2.2.2.1 Emission reduction in the logistics sector

Despite the relatively low carbon emissions compared to other activities in the supply chain, there are opportunities enough to reduce these emissions in the logistics sector. Firstly, emissions can be reduced by efficient route planning to increase vehicle efficiency, increase backload opportunities to avoid empty running, and using Information and Computer Technology (ICT) to provide

real-time route planning (Cullinane 2014, 43–44). Backloading means picking up a new load at the point of delivery so that the truck does not run empty on the way back. ICT can also be used to assist and monitor drivers to encourage more environmentally friendly driving habits (Grant et al. 2015, 70). Secondly, emissions can be reduced by optimizing the number of warehouses and their location, and consolidation opportunities can lead to greater efficiency as small loads are combined to fill a truck (Cullinane 2014, 45). Thirdly, new vehicle technologies like the tear shaped truck design to reduce drag and thus fuel consumption, can be exploited to lower emissions (Cullinane 2014, 46–47). Fourthly, emissions and costs can be reduced by simply choosing the right transportation mode (Emmett & Sood 2010, 133). Fifthly, the World Economic Forum (2009, 17) argues that emissions can be reduced by slowing down the supply chain by easing up on lead times, and thus running vehicles at their optimal speeds. Sixthly, Christopher (2016, 245–246) argues that cooperation with suppliers, or even competitors, can increase efficiency due to combining loads or sharing warehouse space. Finally, the use of alternative fuels like Liquefied Natural Gas (LNG), hydrogen, biofuels and electricity can reduce emissions but caution is advised when judging the sustainability of electricity since not all sources of energy used to provide electricity are sustainable (Grant et al. 2015, 63–66).

Further emission reduction in the logistics sector can be achieved during the construction and the operation of a warehouse, and buildings in general. The impact of either phase on the total amount of emissions differs greatly between warehouses and lifecycle analysis is necessary to determine the exact embodied energy and operational impact (Grant et al. 2015, 86–87). Menzies (cited in Grant et al. 2015, 85) argues that such an analysis can also be used to determine whether to build a new warehouse, or use an already existing warehouse with higher operational costs but without additional embodied energy, because the warehouse has already been built.

To assess the sustainability of the design of a building there are two commonly used standards: The Building Research Establishment Environmental Assessment Method (BREAM) and the Leadership in Energy and Environmental Design framework (LEED). Both standards use a weighted scoring method to rank and certify buildings (Grant et al. 2015, 83–84). Both LEED and BREAM offer an official indication of the sustainability of a building but

most warehouses are currently not certified. Certified or not, opportunities exist to lower the emissions caused by a warehouse.

The building, and possible deconstruction, phase of a warehouse is responsible for the embodied energy of the warehouse. The embodied energy is the energy required to manufacture the parts, and build the warehouse. The materials used to build the warehouse cause emissions and LCA must be used to determine which materials have the lowest embodied carbon cost (Grant et al. 2015, 86–87). Additionally, Grant et al. (2015, 88) argue that manufacturers in the construction industry often ship their materials straight to the building site which leads to transport inefficiencies, and hence unnecessary emissions. Moreover, the construction process requires heavy machinery which generates a large amount of emissions (Grant et al. 2015, 87). Thus, optimizing their use, and using renewable energy sources to power them can reduce the embodied energy of a building. The location of the building can also be an important factor in reducing emissions. Hitchcock and Willard (2015, 140) argue that industrial ecology can lower waste and energy usage, as it involves companies making use of each other's waste and energy in a symbiotic manner. Thus, the waste of one company becomes the resource for another company near it. Additionally, the orientation of the building is important to make maximum use of daylight, and a well-designed building can greatly reduce the heating, ventilation and air conditioning (HVAC) energy required during the operation of the building (Hitchcock & Willard 2015, 140–141). Therefore, companies have many options to reduce the emissions associated with a building already in its design phase. A brief overview of the ways to reduce the emissions of transportation is displayed in Table 1.

Table 1. Overview of emission reductions in transportation

Transportation
Efficient and real-time route planning
Optimization of the number of warehouses and their location
Consolidation of loads
New vehicle technologies
Choosing the optimal transportation mode
Run vehicles at optimal speeds
Cooperation with suppliers and competitors
Alternative fuels like biofuels, LNG and hydrogen
Cooperation with suppliers and competitors
Alternative fuels

In addition to the emissions caused by the construction of a warehouse, operational emissions must be considered. Operational emissions are those emissions that result from the daily operations of a building. Their impact varies greatly depending on the function of the warehouse but operational energy can be reduced by thermal insulation and heat/cold loss barriers regardless of the function of the warehouse (Grant et al. 2015, 89). Moreover, grouping products by temperature requirements can reduce the electricity needed to cool the warehouse (Grant et al. 2015, 89). Additionally, Hitchcock and Willard (2015, 142–144) suggest that educating employers, green cleaning, and separate metering can be used to further reduce operational energy and emissions. Green cleaning involves the use of less hazardous and toxic detergents, while separate metering aims to make each office or area of a building responsible for its own electricity costs and thus elicits more responsible behaviour (ibid.). Yet another method to reduce operational energy can be achieved through efficient route planning and the use of lower emission forklifts (Grant et al. 2015, 90–91). Finally, Grant et al. (2015, 92) argue that warehouses offer opportunities to use renewable energy sources, for instance solar panels, wind turbines, recovered waste energy, and kinetic energy. Moreover, Grant et al. (ibid.) argue that this energy can be used by the building instantaneously, or fed into the local electricity network. Warehouses are often ideally suited for solar panels, but whether the investment is viable depends on the timespan, the company plans on operating it. Thus, LCA should be used to calculate its viability. Table 2 displays a summary of the ways to increase the sustainability of warehouses and buildings.

Table 2. Sustainable practices in warehouses and buildings

Warehouses

Construction phase	Operational phase
Lifecycle assessment	Grouping products by temperature requirement
BREAM or LEED ecolabels	Thermal insulation
Industrial ecology	Employer education
Building orientation	Green cleaning
Optimizing heavy machinery	Low energy forklifts
	Renewable energy sources
	Seperate metering

To conclude, even though the contribution of logistics to the total amount of emissions is relatively low, reductions are nevertheless possible and as seen before, consumers are striving to become greener and they are willing to buy products with lower carbon emissions. Table 1 offers a summary of the possible ways to increase the sustainability of a company's logistics.

Many of the methods described in this chapter are invisible to the final consumer unless actively reported by the firm. Thus, unless the company informs the final consumer, either through marketing communications or emission reporting, the efforts in reducing the carbon footprint of a firm's logistics will have little effect on CBBE. Both sustainable marketing, and carbon reporting will be discussed in later chapters. This also means that carbon management and sustainable marketing are interconnected with all other sustainable practices. Nevertheless, the LEED and BREAM ecolabels can be used to signal the company's dedication to sustainability, and add credibility to the claim. Thus, this research proposes the following hypothesis:

Hypothesis 2 (H_2): For consumers with high sustainability concern, sustainable logistics is positively related with CBBE.

2.2.3 Production

In the long run, sustainable production offers many environmental, social and economic benefits. However, such benefits come at the cost of short-term investments. Garretson, Mani, Leong, Lyons and Haapala (2015, 991) define sustainable production as the creation of goods or services in such a way that

it improves the positive impact, or reduces the negative impact, of manufacturing processes while considering the TBL. Moreover, it strives to reduce waste, emissions and accidents, minimize the costs over the entire lifecycle of a product or service, and decrease the use of non-recycled material and non-renewable energy (Emmett & Sood 2010, 95). Thus, an important first step towards more sustainable production is the use of renewable energy sources like solar, thermal and wind energy, as well as a reduction in the use of virgin materials.

Unfortunately, manufacturing is often offshored to low labour cost countries where enforcement of regulations is lax, and there is little incentive to lower GHG emissions and prevent hazardous substances from polluting water sources (Grant et al. 2015, 102). This is specifically a problem in the textile industry where most of the manufacturing has been offshored to developing countries with low labour costs. Moreover, Nagurney and Yu (2012, 532) argue that the textile industry is responsible for large amounts of emissions, and De Brito, Carbone and Blanquart (2008, 535) state that the textile industry uses hefty quantities of chemicals to die the cotton. These chemicals then end up polluting local water sourcing, and affecting the health of millions of people.

Despite lax enforcement, companies have taken steps towards more sustainable production. Companies are beginning to realize that their long-term success depends on it, and large multinationals have even started manufacturing operations close to their markets instead (Hitchcock & Willard 2015, 52). Thus, sustainable production is becoming more prevalent as companies begin to realize their production processes have a negative impact on the environment and society, and their very future depends on more sustainable processes.

2.2.3.1 Supply chain transparency and waste

Consumers are becoming more environmentally aware. Even though they are often uninformed of the precise production processes, due to large complex and global supply chains, consumers are conscious of the waste and pollution caused by companies. On the other hand, as mentioned before, production has increasingly been moved to developing countries, especially in the fashion

and apparel industry. Thus, companies have often lost sight of their own production processes and the resulting environmental consequences (Emmett & Sood 2010, 101). Moreover, Emmett and Sood (ibid.) argue that this lack of transparency in the supply chain leads to false environmental friendly claims as companies outsource most, if not all, of their activities that cause GHG emissions and pollution. This lack of information and transparency often hampers the change toward more sustainable production, and it is effectively green washing. Thus, increased supply chain transparency is an important step toward sustainable production. Supply chain transparency will be further discussed in a later chapter.

It is obvious that sustainable production should lead to a reduction in waste. Thus, it stands to reason that an increase in production efficiency to create more products from less raw materials, leads to more sustainable production (Emmett & Sood 2010, 111). While obvious, waste is not just limited to inefficient use of materials or labour. Waste comes in many shapes and forms. Emmett and Sood (2010, 116) identify the following types of waste: excessive stocks, unnecessary movement of people and equipment, idle labour and equipment, nonvalue adding activities, defects, excessive production and improper use of employee's intellectual capacities. Consequently, to become more sustainable companies need to cut out these seven types of waste as much as possible.

2.2.3.2 Lean production

One method to reduce manufacturing waste is lean production. The goal of lean production is to eliminate all seven types of waste and create products of the best possible quality while also being extremely reactive to customer demand (Emmett & Sood 2010, 113). Santos, Wysk and Torres (2006, 9) argue that lean manufacturing requires three important aspects. The first of these aspects is "kaizen" and it aims at continuous small improvement to reduce cost and time, and increase product quality (Santos, Wysk & Torres 2006, 1–2) and thus lower defects and waste. The second aspect, "jidoka", refers to autonomation to automatically spot defects and stop production when a defect occurs until the cause of the defect has been located (Santos, Wysk & Torres

2006, 9). The third and final aspect of lean production is just in time (JIT). Per Emmett and Sood (2010, 117), JIT requires efficient communication to make certain that “the right inventory can be made available to the right process at the right time with replenishment reorders made accordingly.” Consequently, JIT leads to savings in energy, waste, space and resources (ibid.). However, JIT results in frequent small deliveries and thus can be at odds with the principles of sustainable logistics which benefits from consolidation of deliveries to create full truck loads (FTL) as well as slowing down the supply chain in general. Thus, even though lean production leads to a reduction in waste in the manufacturing process, it can lead to an increase of GHG in other parts of the supply chain. This trade-off is however often a small price to pay for the reductions in waste in the manufacturing process because, as seen before, logistics emissions are only a minor part of the total emissions over the lifetime of a product.

Another method to reduce manufacturing waste is Six Sigma. Emmett and Sood (2010, 118) state that this management methodology aims at the reduction of defected products and thus the reduction of waste. Six Sigma revolves around continuous small improvements through statistical analysis by refining the goals on a constant basis as improvements are made (Emmett & Sood 2010, 119). Thus, Six Sigma is much like kaizen which also aims at continuous improvement. However, unlike kaizen, Six Sigma is grounded in rigorous statistical analysis.

Yet another method to reduce waste in the production process is the 5S methodology. This methodology revolves around creating a clean working environment through five steps (5S): sort, set in order, shine, standardize, and sustain (Santos, Wysk & Torres 2006, 148–149). Essentially, it is a methodology that removes unnecessary items, organizes the necessary ones, keeps the work floor clean, and continuously reinforces this systematic method until it becomes habitual (ibid.). Thus, by organizing and standardizing the work floor, efficiency increases and waste is reduced.

2.2.3.3 Sustainable production and CBBE

Production is responsible for a vast share of the total emissions during the lifespan of a product, and while the earlier mentioned methods all lead to a reduction in waste, ultimately the goal must be to reach zero waste. Zero waste does not necessarily aim at the removal of all waste. Instead, zero waste means that the waste one company produces should be a resource for another company (Hitchcock & Willard 2015, 70). Research done in the United States showed that only 6% of all inputs end up in the final product which means that 94% of all resources are essentially waste (ibid.). Thus, sustainable production can have a proportionally large effect on the reduction of the carbon footprint of the final product.

However, consumers are often unaware of most of the manufacturing methods described in this chapter. For them what counts is the reduction in waste, emissions and pollution during the manufacturing of a product. Thus, for a consumer who is more environmentally aware, such products can have additional value. Peattie (1995, 166) argues that consumers are already purchasing more products from companies with a sound green history, and as such are increasingly interested in the environmentally friendliness of a firm's production processes. Additionally, consumers care about the quality of the final product and many of the production process improvements discussed in this chapter lead to increased product quality which is, per Aaker (1991, 94) pivotal to attaining perceived quality. Perceived quality in turn is an antecedent of CBBE. Thus, this research suggests the following hypothesis:

Hypothesis 3 (H_3): For consumers with high sustainability concern, sustainable production is positively related with CBBE.

2.2.4 Packaging

Packaging is the first aspect of a product consumers see and experience. Previously, it was noted that packaging should be considered in tandem with logistics because the product and package travel from supplier to final consumer together and thus packaging design has an impact on sustainable logistics. Moreover, packaging not only affects handling, storage, and energy

use during transportation but it is also responsible for waste along the supply chain (Molina-Besch & Pålsson 2014, 138). Additionally, sustainable packaging is part of sustainable marketing because packaging and a product are inherently connected. However, due to the strong influence of packaging on brand equity (Aaker 1996, 187–188; Keller 2013, 142) and sustainability it will be discussed separately in this chapter.

Traditionally, the role of packaging was to protect the product during storage and transit. While this is still the case, the role of packaging has changed. Packaging now also provides the consumer with information regarding the product and its use, and it is further used to draw attention to the product. Thus, the function of packaging is also a call to purchase the product. Unfortunately, marketers have started to use excessive packaging to attract customers, which has resulted in unnecessary waste. Customers on the other hand have become more and more aware of the pollution caused by excessive packaging and hence, sustainable packaging has gained in popularity. (Emmett & Sood 2010, 139–140.)

Excessive packaging has introduced another problem besides pollution. Since a large amount of packaging is made from plastics, and plastic waste is harder to recycle, hefty quantities of plastic packaging end up in landfills (Grant et al. 2015, 123). Moreover, recycling plastic is a laborious task due to all the different grades of plastic that need to be separated manually, while the benefits in terms of emission and cost reduction are often questionable, and hence large amounts of plastic waste are exported to countries with lower labour costs like China (Grant et al. 2015, 161; McBride 2012, 173–184). Thus, packaging has come under increased scrutiny in recent years.

To battle excessive packaging that ends up in landfills, the EU introduced the 94/62/EC Directive on packaging and packaging waste. This directive sets general guidelines but leaves it up to the member states of the EU on how to enforce the directive. For instance, the United Kingdom introduced the Producer Responsibility Obligations (Packaging Waste) Regulations in 2007. It makes producers responsible for their packaging waste and charges them a fraction of the recovery and recycling cost. Moreover, it charges packers, retailers and wholesalers more than manufacturers as they are responsible for a bigger share of the packaging waste. (Grant et al. 2015, 113–114.)

As pressure to reduce excessive packaging rises, companies are forced to rethink their packaging strategies. Moreover, a reduction in packaging can also be beneficial from a company perspective because it lowers overall packaging cost as well as its environmental impact (Emmett & Sood 2010, 143). Additionally, Emmett and Sood (2010, 143) argue that benefits go beyond the financial and the environmental because the packaging is the first thing consumers experience and thus influences how consumers feel about the company. Green packaging thus becomes a proxy for the sustainability of a company or product.

2.2.4.1 Sustainable packaging strategies

There are four key differences between traditional packaging and sustainable packaging. First, sustainable packaging is reduced to a bare minimum; no more than the product absolutely needs for protection during transit and storage, and just enough to be able to inform the consumer of its reduced environmental impact. Second, sustainable packaging can be reused. The company takes full responsibility and recovers the packaging from the consumers and reuses it. This method is particularly useful for products that are delivered straight to the customer’s home. Third, packaging that cannot be recovered and reused directly, should be recycled in the most environmental and efficient way possible. Finally, sustainable packaging is redesigned and reformed to lessen its environmental impact, for instance biodegradable packaging, use of recycled and environmentally friendly material, and changing the method of delivery from a product to a service. (Emmett & Sood 2010, 141–142.)

Thus, for packaging to become more environmentally friendly it needs to be reused, recycled, reformed and reduced (Figure 5).

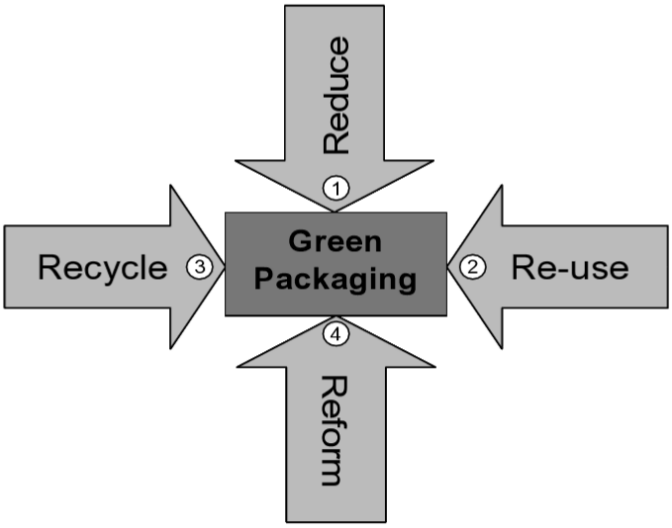

Figure 5. Strategies for sustainable packaging (Emmett & Sood 2010, 141)

However, the method used to deliver the sustainability message is important as well. Magnier and Schoormans (2015, 60) conclude in their research that for consumers, who care little about the environment, a sustainability claim only leads to increased purchase intentions if the packaging also actually looks environmentally friendly. In fact, conventional packaging presented with a sustainability claim was evaluated more negatively by these consumers, and led to a reduction in purchase intentions (ibid.). For consumers who are highly environmental conscious, attitudes are the same for conventional and green packaging with a sustainability claim but when such a claim is missing, these consumers look more favourable upon products with environmentally friendly packaging (ibid.). The main conclusion of the research was, that even though companies tend to hint at the environmental friendliness of their packaging with a sustainability claim only, both groups of consumers are more likely to believe environmentally friendly looking packaging in addition to such a claim.

In a similar study, Martinho, Pires, Portela and Fonseca (2015, 65–66) discovered that price of a product is the most important determinant whether consumers consider sustainable packaging. Though the clear majority of environmentally aware consumers was willing to pay a small premium (between 1-5%). Moreover, packaging design was not considered an important determinant. Instead, high product quality, low prices and high functionality were the

main concern of consumers. However, consumers that are more environmentally aware showed more favourable attitudes towards sustainable packaging. (Martinho et al., 64–65.)

In yet another packaging study, Rokka and Uusitalo (2008, 522) conclude that environmentally friendly packaging is a product attribute that has a strong influence on purchase intentions, even as strong as price, for consumers buying drink products. While this conflicts with other studies, Rokka and Uusitalo (2008, 522–523) concluded that the share of consumers who care about green packaging is far larger than expected, and that the members of this group can no longer just be described as relatively high income and high education young females. While caution is necessary due to the conflicting results compared to other packaging studies, sustainable packaging does nevertheless deserve more attention from marketers as it has as considerable potential to affect purchase intentions. It is however doubtful its effect is as strong as product price.

Sustainable packaging thus influences attitudes of consumers as well as purchase intentions. Furthermore, Aaker (1996, 187–188) argues that packaging has a strong influence on the identity of a brand. Likewise, Keller (2013, 142) notes that packaging is one of the brand elements and these brand elements have a strong influence on brand equity. Thus, packaging can be considered a cost-effective method to build brand equity because consumers create strong brand associations based on the packaging of a product and packaging is an effective method of differentiating brands (Keller 2013, 165–166). These associations in turn affect a consumer's brand knowledge and thus CBBE (Aaker 1996, 68; Keller 1993, 7). Consequently, since environmentally aware consumers show positive attitudes towards sustainable packaging and less environmentally aware consumers show no negative attitudes, if the packaging and the sustainability message are congruent, this research suggests the following hypothesis:

Hypothesis 4 (H_4): For consumers with high sustainability concern, sustainable packaging is positively related with CBBE.

2.2.5 Reverse logistics and waste management

Just like its name suggests reverse logistics involves the movement of goods from the consumer to the manufacturer, and is indistinguishable from waste management and recycling, with the objective of gaining value from products that are at the end of their lifecycle, or in some cases to comply with legislation (Grant et al. 2015, 151). This legislation can for instance be in the form of extended producer responsibility (EPR) which holds manufacturers responsible for a product during the entirety of its lifecycle. Thus, some companies have begun to setup reverse logistics networks to recover their products to lessen the environmental impact of their business as well as recover value when a product has reached the end of its lifetime.

The role of reverse logistics and waste management is becoming ever more important. Households generate vast amounts of waste, and a big share of this waste ends up in landfills. Moreover, in the densely-populated areas of Europe finding room for new landfill sites is no easy task. Additionally, natural resources are finite and consumption is growing ever faster as the earth's population keeps growing (Grant et al. 2015, 149). This demand for virgin materials leads to higher costs for resources but it is not the only reason that drives companies to setup supply loops. Per Grant et al. (2015, 150), increased costs of energy and waste disposal, as well as legislation and social corporate responsibility (CSR) are additional powerful motivators for reverse logistics. Similarly, De Brito and Dekker (2003, 6–7) argue that companies engage in reverse logistics because they are either driven by profit, forced by legislation or strive to be a good corporate citizen. Moreover, Kokkinaki, Dekker, Van Nunen and Pappis (2000 cited in Halldórsson & Skjøtt-Larsen 2007, 4) conclude that the three main reasons companies opt for reverse logistics are: to recapture value, to lessen the environmental impact of their activities, and to gain a competitive advantage. Thus, there are various drivers and reasons for companies to opt for reverse logistics but profit is obviously a very strong motivator. On the other hand, some companies have little choice as legislation makes them responsible for their products even after the end of their lifecycle. This is the case for instance in the tire industry.

2.2.5.1 The waste management pyramid

Reverse logistics, or waste management, prevents products from ending up in landfills and incinerators (Grant et al 2015, 152). Instead it aims to recover as much of the material and energy as possible. The waste management pyramid depicts the possible ways this can be accomplished with the most environmentally friendly method on top and the least on the bottom. The best method is to simply reduce waste, hazardous materials, and energy through sustainable production principles (ibid.). Additionally, El Haggar (2007, 2) argues that “reduced material volume at the source” can be accomplished through EPR and consumer education. Because EPR makes companies responsible for their products and/or packaging even after the end of its lifespan, they are more motivated to reduce the amount of materials they use. Reducing is the only waste management option that does not require any additional processing.

The remaining options require that the product or packaging is gathered and/or processed. The next best option, after reducing, is to reuse the product or parts of a product (Grant et al. 2015, 152). El Haggar (2007, 3) concludes that reusing is another form of source reduction, which is the best form of waste management because it diminishes the use of virgin materials. Recycling is a form of waste management that recovers the material of a product but usually needs energy as an input (Grant et al. 2015, 152) and is thus less environmentally friendly than reusing or reducing. Recovery involves the extraction of embedded energy of a product through incineration to turn energy into electricity (ibid.). The burning process causes emissions and is therefore less environmentally friendly than the previously mentioned methods. The final waste management option is disposal in landfills. This option is problematic because the material is not “easily degradable” and some products may have toxic substances (ibid.). Waste management thus offers various options to deal with a product at the end of its life, or any other product return like a defect product, to lower inputs of virgin materials and lessen the environmental impact of a product.

2.2.5.2 The reverse logistics process

Reverse logistics has several key processes that returned products must go through. First, per Agrawal, Singh and Murtaza (2015, 78) products must be acquired through a process called gatekeeping as it involves a decision to either acquire the product or return it to the customer. Next, the product must be collected and delivered to a central location where it is inspected and sorted to make a disposal decision for repairing, reusing (for instance resold in the market at a lower value), remanufacturing, recycling or final disposal (ibid.). These processes are often time consuming and require manual labour as input.

There are two ways to organize the processes in a reverse supply chain. Either centralized, where one party, the producer, a dedicated logistics company or a third-party logistics (TPL) provider, takes care of all the processes or decentralized where multiple different companies take care of different processes in the reverse supply chain (Halldórsson & Skjøtt-Larsen 2007, 11–12, 16). The advantage of the former is that the producer has more control over the entire process, while the latter requires less knowhow and investments.

Companies willing to engage in reverse logistics must facilitate product returns. These returns can be end-of-life, end-of-use, or commercial returns (Halldórsson & Skjøtt-Larsen 2007, 9). Moreover, De Brito and Dekker (2003, 9–10) classify these returns as either, manufacturing, customer, or distribution returns. Customer returns obviously must be collected and due to the uncertain nature of the frequency of these returns, this is often problematic. However, several methods exist to collect these products. The first method is to charge a deposit fee, which will be returned when the consumer returns the used product or packaging. This method is often used for bottled and canned beverages. Second, companies can propose to take products back, either with or without charge, and this method is common for leased products like photocopiers and cars. Third, car dealers and mobile phone retailers for instance, often allow products to be traded in for a certain price, in return for a new purchase. The next option is for municipals or commercial waste management companies to collect products straight from the customer’s premises. The final option to collect products is through recycling centres, where consumers can discard their products. (Grant et al 2015, 160.)

For companies, it is important to choose the right method to capture as much value as possible from these product returns. Per Halldórsson and Skjøtt-Larsen (2007, 7), reverse logistics is often more difficult than normal logistics because of “variations in timing, quality, and quantity of product returns.” Moreover, Halldórsson and Skjøtt-Larsen (2007, 7) identify the following additional problems companies that engage in reverse logistics must deal with:

- Reduced value due to delays of time sensitive products
- Lack of expertise
- Can lead to cannibalization of new products
- Inability to measure the performance of reverse logistics
- Often informal ad hoc methods to deal with product returns

In addition, per McBride (2012, 129–130) manual labour is required in even the most computerised waste recovery factories, and this labour is often monotonous and dangerous while in contrast labour at incinerators or landfills is much less hazardous and much less complex. Moreover, Genchev (2008, 142) states that inspecting product returns and making a disposal decision is a complicated task that requires highly qualified labour and hence extensive training. Thus, companies often lack expertise or motivation to engage in reverse logistics. The high labour requirements to sort and handle the returned products means that the costs of reverse logistics are high and consequently, margins are low.

2.2.5.3 Reverse logistics and CBBE

Low margins are often a deterrent for the implementation of supply loops. However, Khor, Udin, Ramayah and Hazen (2016, 106) conclude that in the absence of regulations, recycling and repair processes lead to increased profit while remanufacturing processes increase sales but when regulations increase, the performance of all reverse logistics activities, apart from recycling, improve. Consequently, given the ever-increasing legislation on waste and EPR, reverse logistics leads to increased profit and sales.

Customers might perceive reused or remanufactured goods, or products, either partially or fully, made from recycled materials to be of inferior quality. For example, recycled paper appears often to be of worse quality than normal paper. Because perceived quality is one of the antecedents of CBBE (Aaker

1991, 16), it can be expected that reverse logistics has a negative impact on brand equity. Yet, customers are becoming more and more aware of the environmental impacts of the products they buy. Moreover, the depletion of natural resources is also becoming a concern for consumers. Consequently, supply loops are still a double-edged sword. Considering customers turning ever greener, this research tentatively suggests the following hypothesis:

Hypothesis 5 (H_5): For consumers with high sustainability concern, reverse logistics and waste management are positively related with CBBE.

2.2.6 Marketing

In its earliest incarnation, green marketing only dealt with environmental concerns but over the years it has changed to become more encompassing. Green marketing can be defined as a holistic management approach that tries, in a sustainable and lucrative manner, to predict and manage society's and customer's needs. Moreover, at the cornerstone of green marketing are the following two simple principles. Resources must be used at the same rate as the earth can produce them, and waste cannot be produced at a faster rate than that the earth can break them down. (Peattie & Charter 2003, 727–728.)

While less encompassing, the principles of green marketing are like those in TNSF. This realization is important because green marketing is near enough the same as sustainable marketing and the terms are often used interchangeably in literature. Martin and Schouten (2014, 18) define sustainable marketing as "the process of creating, communicating, and delivering value to customers in such a way that both natural and human capital are preserved or enhanced throughout." The important difference is the mention of human capital in their definition as opposed to Peattie's definition of green marketing. Martin and Schouten (2014, 18) further point out that this definition is not meant to replace the traditional definition of marketing as established by the American Marketing Association nor is it in conflict with the principles of marketing because it is still revolving around a business gaining a competitive advantage through meeting customer needs in a superior way.

2.2.6.1 Segmentation

One of the first problems a company faces when opting for sustainability is targeting the right customers. Not everyone responds well to more sustainable products and certainly not when a price premium must be paid for such goods (Martin & Schouten 2014, 104). Customers who are receptive to sustainable products and services, together with the companies that actively engage in satisfying the needs of these customers, form the green market (ibid.). Peattie (1995, 154–164) argues that it is exceedingly problematic to segment the green market, and many attempts have failed to identify a distinct, unique, and large enough segment. If marketers cannot find such a homogeneous, unique and large enough customer segment then targeting these green consumers with a green marketing strategy is unlikely to be profitable. Thus, the green consumer appears to be an elusive being. However, in more recent literature, Martin and Schouten (2014, 105–109) conclude that such segmentation is possible based on psychographics, for instance the Lifestyles of Health and Sustainability (LOHAS) segmentation (ibid.). While segmentation remains problematic, the green market is nevertheless growing, and with it grow the possibilities for proper segmentation.

Peattie and Charter (2003, 737) argue that perhaps a better method is to try and understand the purchase instead of the consumer. Consumers need to make some sort of sacrifice, be it a premium price, reduced product specializations or increased traveling time to a specialized outlet, when purchasing a green product (ibid.). Thus, Peattie and Charter (2003, 737–738) argue that the consumer must experience that the product addresses a real environmental problem, does so better than the offerings from competitors, and the purchase helps solving this problem. Thus, to truly serve these customers companies must make certain their products are beneficial in the eyes of the consumer. Consumers are increasingly aware of sustainability problems (Peattie & Charter 2003, 738) and will not purchase green products if they lack the confidence that these products help solve the problem. Therefore, instead of finding a proper segment, it is perhaps more important to design products that address the environmental needs of the consumers while appealing to both green and normal consumers.

2.2.6.2 Design for environment

When companies have successfully segmented their markets, understood their customer's purchase decisions, the next challenge is to create sustainable products. Unfortunately, the apparel industry is still plagued by pressure for short product lifecycles (Macchion et al. 2015, 186) and thus excessive waste as products are discarded quickly after use, and new products are acquired. As product lifecycles (PLC) are shortening and consumption is increasing far beyond a sustainable level, it is important that companies, which aim to be sustainable, slow down this cycle. Furthermore, both Peattie and Charter (2003, 741), and Kotler (2011, 135) argue that even though marketing's purpose is to increase demand, at times this demand needs to be lowered instead or else consumption levels will become unsustainable.

In a sustainable marketing strategy, PLCs should be lengthened instead of shortened, and marketing should find ways to keep selling existing products (Peattie 1995, 186). Moreover, per Peattie (1995, 187) companies should adopt product stewardship and thus take responsibility for a product from cradle to the grave, or even cradle to cradle. Thus, from when it is designed, all the way till the ends of its lifetime, after which it is recovered and recycled, and used again. However, serving green consumers with current products will only have a limited impact and thus new products, or even brands, should be created that appeal both to green and normal consumers (Peattie 1995, 188). To design products with a reduced negative environmental impact, companies should adopt Design for Environment (DfE).

The purpose of DfE is to lower the environmental impact of a product during both its production and use phase (Hitchcock & Willard 2015, 56). There are many ways to increase the sustainability of a product already during the design phase. They consist of (Grant et al. 2015, 103–104; Hitchcock & Willard 2015, 56–57; Lewis, Gertsakis, Grant, Morelli & Sweatman 2001, 38; Martin & Schouten 2014, 141–142; Peattie 1995, 188–189):

- Choosing materials that have the lowest environmental effect, for instance choosing recycled material over virgin material or choosing materials with the lowest embodied energy
- Replacing hazardous and toxic materials like pesticides, and harmful chemicals
- Selecting production processes that reduce waste and emissions

- Increasing energy and water efficiency
- Minimizing waste, and creating products that have an increased lifespan
- Replacing fossil fuels with renewable energy sources
- Planning for logistics and reverse logistics by making the product easy to disassemble, reducing the packaging, and optimizing product weight and space

Moreover, DfE deals with many of the sustainability practices described in previous chapters already in the design phase of the product. Consequently, the DfE approach is more effective at increasing sustainability than trying to improve a product that is already in the market because the product is designed from the ground up, and thus opportunities to improve the environmental performance are built into the product.

2.2.6.3 Sustainable promotion and pricing

When products have been designed with sustainability in mind, they still need to be promoted. The role of marketing communication for sustainable products is mostly like normal products. However, transparency is pivotal (Martin & Schouten 2014, 209; Peattie 1995, 217) since customers and non-governmental organizations (NGOs) are sceptical of a company's motives, and without transparent and honest communication consumers quickly accuse a company of greenwashing. Additionally, credibility of the message is important as well. Companies often use NGOs or the media to tell their sustainability story to gain credibility (Martin & Schouten 2014, 210–211). Similarly, ecolabels can increase the credibility of a sustainability claim but the large number of different labels creates confusion and lowers their efficacy (ibid.). Additionally, companies should actively try to educate their consumers on the benefits of their sustainable products (Martin & Schouten 2014, 212).

Obviously, organizations must decide whether to communicate their sustainability efforts in the first place. Some companies actively pursue sustainability but do not communicate their efforts to the public while Body Shop's entire business format revolves around communicating their dedication to greener products. The main point is that companies should build trust with their customers through transparent and credible communication, because brand trust is an important factor in brand loyalty (Chaudhuri & Holbrook 2001, 89) which

in turn leads to brand equity. If a business cannot build this trust, then it is better not to communicate sustainability efforts to avoid being accused of greenwashing.

Sustainable products are often priced at a premium because of the increased costs associated with designing, manufacturing and marketing such products. However, as seen before, in the long run these products do not necessarily have to cost more. Nevertheless, Peattie (1995, 288) argues that price has played a far too prominent role in customer's purchase decisions as well as companies' marketing decision. Instead, the focus should be on costs.

This focus on price has serious complications for sustainable products. Peattie (1995, 287) argues that companies too often price their green products based on demand, and thus, even though eco-friendly products might be cheaper to produce, they end up costing more than their unhealthy counterparts and thus low income families cannot effort them. Instead, sustainable pricing should be used to de-market (lowering demand and thus consumption) certain products that use rare virgin materials or cause vast amounts of emissions, and are unsustainable in the long run (Peattie 1995, 288). Moreover, Martin and Schouten (2014, 190–191) argue that price often does not include externalized costs; the costs associated with emission and pollution caused during the entire life of the product, and thus appear to be cheaper than their sustainable counterparts. Consequently, life-cycle costing (LCC) should be used to calculate all the costs, including externalities, to determine the real price of a product. When all costs are calculated and thus prices are set based on true costs, sustainable products will fare much better in comparison. Finally, Peattie (ibid.) shows that "steamboat restaurants" are an excellent example of how pricing can lead to a reduction in waste, preserve the environment, and lead to customer satisfaction. These restaurants allow consumers to eat as much as they like for a set price, however if they have more than 50g leftovers, they are charged double (ibid.). Thus, this type of pricing reduces waste, while also increasing customer satisfaction because consumers feel they get good value for their money if they are not wasteful.

The process of sustainable marketing begins by segmentation of the green market and identifying the environmental and social needs of the target consumer (Figure 6).

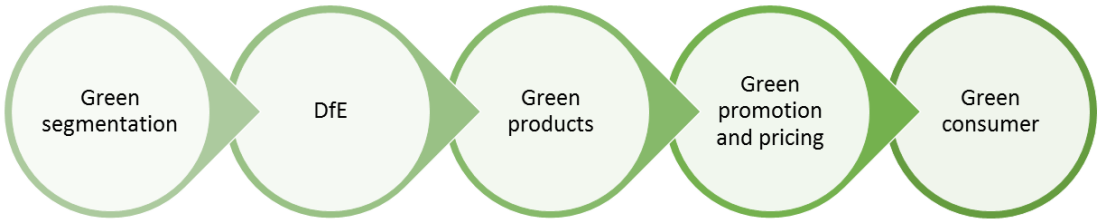

Figure 6. Serving the green consumer

Then these needs are translated into sustainable products through DfE. Finally, these products are promoted and sold at the right price to appeal to the green consumer.

2.2.6.4 Sustainable marketing as a strong driver of brand equity

Sustainable marketing also requires redefining customer satisfaction. Peattie (1995, 36) argues that the performance of a product when it is consumed is no longer enough, because a consumer that cares for sustainability will judge the performance negatively if social or environmental damage has been caused during the creation of the product. Thus, for a consumer who is concerned about the environment there is a relation between satisfaction and the level of sustainability of a product. Additionally, per Stafford and Hartman (2013, 33), sustainably designed products should be aligned with other consumer benefits or personal core values to show consumers the added value of such a product. Therefore, sustainable marketing aims at serving sustainability aware consumers, and increasing their satisfaction, with products that are specifically designed to fulfil their needs while de-marketing those products that lead to unsustainable consumption.

Likewise, sustainable marketing communications should foster brand trust and thus brand loyalty, as both brand loyalty and satisfaction are positively related with brand equity (Aaker 1991, 16, 40). Moreover, Pappu and Quester (2006b, 9–10) discovered that satisfaction had a significant relation with brand awareness, brand associations, and thus brand equity but not a significant relation with brand loyalty. However, the research was limited to retail stores which

could be the reason for this discrepancy with other studies that focused on product brands (Pappu & Quester 2006b, 10). Nevertheless, there is strong evidence that transparent and honest marketing communications enhance brand equity of sustainable brands. Moreover, a relation between PR and CBBE was already established in a previous chapter. Thus, those companies that can leverage their sustainability efforts through PR should see an increase in brand equity. However, transparency is of utmost importance or a company risks being accused of greenwashing, which will harm brand equity.

Unfortunately, as seen before, sustainable products often end up costing more than their normal counterparts because externalities are not factored into the cost of these normal products. However, De Medeiros, Ribeiro and Cortimiglia (2016, 164–165) conclude that there is a statistically significant correlation between environmentally aware consumers, and a willingness to pay a price premium, albeit a weak one. Moreover, Aaker (1996, 320) argues that a price premium is a good proxy for brand loyalty. Hence, the fact that consumers are willing to pay more for green products means there is a positive relation between sustainability and CBBE (Figure 7).

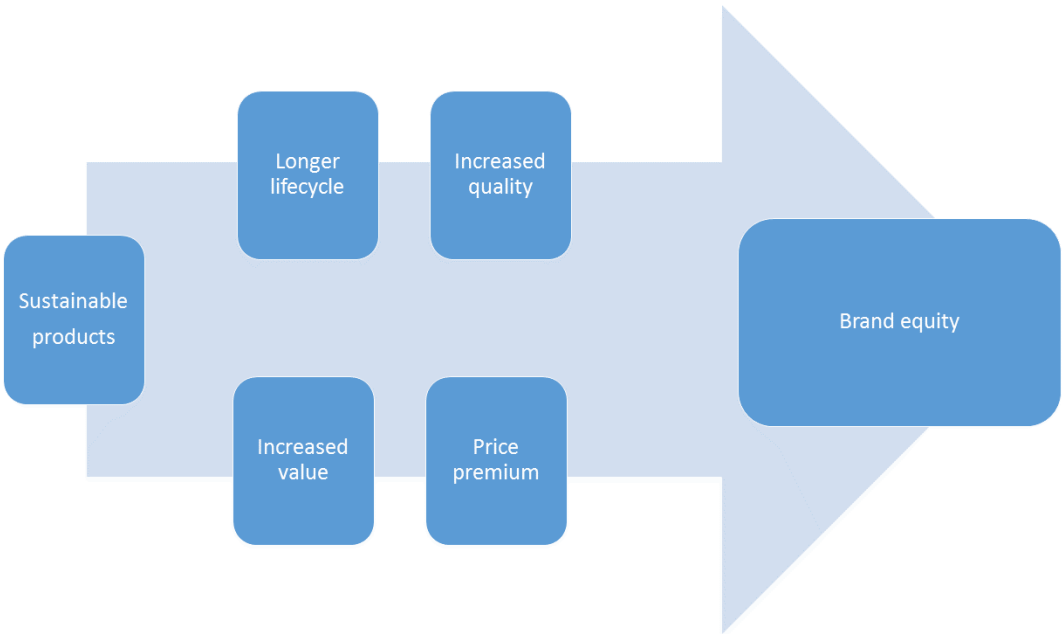

Figure 7. The relation between sustainable products and brand equity

Furthermore, as PLCs are lengthened, and products are designed with durability in mind, customers might perceive their quality to be superior when compared to the short lived unsustainable counterparts. As stated before, perceived quality is an antecedent of brand equity (Aaker 1991, 16). Thus, as was already claimed earlier in this study, DfE leads to increased CBBE. Additionally, truly sustainable pricing can lead to customer satisfaction. Therefore, it is expected that sustainable marketing has a strong positive effect on CBBE. Consequently, this research suggests the following hypothesis:

Hypothesis 6 (H_6): For consumers with high sustainability concern, sustainable marketing is positively related with CBBE.

2.2.7 Carbon management

Supply chains have become increasingly more complex and global and are spanning many different countries and companies and thus, discovering who is responsible for the emissions during each stage of a product, is no easy task. Moreover, in some industries companies can have tens of thousands of suppliers. By the same token, in the textile apparel industry cotton farmers are responsible for a big portion of the carbon footprint of the final product. Furthermore, companies can outsource most of their emission generating undertakings and face little consequences of their polluting activities (Emmett & Sood 2010, 183). However, supply chain transparency is becoming ever more important as consumers are becoming increasingly aware of the practices of multinationals, even in faraway locations; often as the result of social media or NGOs. Additionally, as the result of the Kyoto protocol, policies have been introduced to make companies, in the most polluting sectors, responsible for their emissions, and thus these emissions need to be measured and managed.

Currently, these policies to reduce GHG are based on a free market solution, either a system that allows the trading or offsetting of emissions (cap-and-trade) or a straight carbon tax charge (Ramseur & Parker 2010, 1). Moreover, the main purpose of both methods is to increase the price of fossil fuels. However, cap-and-trade restricts the quantity produced while carbon tax affects the price (ibid.) and thus lowers demand due to an increased product price.

Arguably, while the system is supposed to make those responsible for emissions pay, the end consumer ultimately pays due to an increased product price. Emmett and Sood (2010, 185) argue that this free market based cap-and-trade system is largely ineffective, and the current method of carbon trading and offsetting might see further policy changes. However, in recent developments, and as a direct result of the recent Paris agreement on climate change, the airline industry is voluntarily introducing cap-and-trade to offset their ever-increasing emissions from 2020 onward. Thus, for now, cap-and-trade seems to be here to stay despite its shortcomings.

Therefore, as supply chains are becoming increasingly more complex, multinational companies must measure, report and take responsibility for all the emissions and pollution caused by activities in their entire supply chain, and if possible, offset excessive emissions elsewhere. Moreover, the pressure from consumers and NGOs are additional reasons to become more transparent. Thus, companies have introduced carbon management (Figure 8).

Figure 8. The carbon management process leads to continuous improvement (Emmett & Sood 2010, 186)

This carbon management is the process of managing the carbon footprint of the entire supply chain, and it consists of carbon measurement, carbon minimization, carbon monitoring and carbon reporting (Emmett & Sood 2010, 185).

2.2.7.1 Managing the carbon footprint

Carbon management starts with measuring the carbon footprint. Emmett and Sood (2010, 187–188) argue that such measuring is complex and requires a holistic approach that considers the complete supply chain but finding the company that is ultimately responsible for managing the carbon footprint of the supply chain is no easy task. Moreover, Emmett and Sood (2010, 188) reason that the company with the biggest impact in a supply chain should be responsible, and those companies not willing to take that responsibility will soon find their customers moving to greener pastures. The exact method of carbon measurement is also problematic as many different methodologies exist. Moreover, Emmett and Sood (2010, 188–192) state that the use of different methodologies can lead to a measured difference in emissions of up to 300%. Consequently, choosing the right methodology, and using it over an extended period, is paramount.

Once a company is getting reliable information about the carbon footprint of the entire supply chain, the next step is to minimize the emissions. Emmett and Sood (2010, 192) state that carbon minimization can take the form of emissions reduction, abatement, sequestering, and offsetting. Like waste management where source reduction is paramount, so is straightforward reduction of emissions. Straightforward emission reductions can be achieved through all the previously discussed methods, for instance through adopting sustainable production processes, reduced input of natural resources, waste management, and sustainable logistics (Emmett & Sood 2010, 193–194). Another method to minimize the carbon footprint is through carbon offsetting. This method involves investing in projects that have a positive environmental impact (Emmett & Sood 2010, 195) and under a cap-and-trade system such investments would earn tradeable credits which then can be used to offset a company's emissions (Roosa & Jhaveri 2010, 205). Carbon sequestering on the other hand revolves around capturing and storing carbon. Roosa and Jhaveri (2010, 141) argue that the best method to sequester carbon is to copy the earth's natural processes that turn carbon into minerals, thus in essence through biomimicry. Finally, carbon abatement deals with technologies that reduce emissions when burning fossil fuels like coal and oil. Thus, companies

have a large amount of options to reduce their carbon footprint. However, carbon reduction, the best option, requires long-term investments and a long-term vision while carbon offsetting is a short-term and relatively cheap fix. Companies that truly aim to be sustainable therefore need a long-term orientation and need to be willing to invest in new technologies.

Obviously, once a company has started to measure, and has taken steps to minimize, the carbon footprint, the process needs to be monitored and reported. Emmett and Sood (2010, 196) argue that monitoring is vital to keep abreast with the changes and to report up-to-date and correct data to avoid greenwashing. The final step in the process is to report to various stakeholders who all require different levels of information. Moreover, multiple countries are now introducing policies that force companies to report information pertaining their carbon footprint (Emmett & Sood 2010, 197). One such method to report sustainability efforts is the Global Reporting Initiative (GRI). Hitchcock and Willard (2015, 225) argue that GRI offers a solid standard that leads to reports that are comparable, and thus allows stakeholders, including consumers, to compare the efforts of different companies.

The carbon management process does not end with reporting, but it is rather a process of continuous improvement. Once changes have been implemented and monitored, new opportunities for emission reductions will present itself, and the process starts all over again. The aim should after all be zero emissions.

This process of carbon management is like an Environmental Management System (EMS). However, conventionally, EMS did not concern itself with a supply chain wide approach but only focused on a company’s impact. However, a more holistic product approach, where the entire supply chain is considered, is gaining more ground (Sroufe & Sarkis 2007, 20). Consequently, this cradle-to-cradle EMS approach is effectively a carbon management system.

Carbon management is a holistic approach to reduce the carbon footprint of a supply chain and encompasses many of the topics discussed in previous chapters. Those companies that directly and openly communicate their commitment to emission reductions, and the results of their emission reduction ac-

tivities, to the public should gain positive PR effects. The positive relation between PR and CBBE was already documented earlier in this study, and thus this research suggests the following hypothesis:

Hypothesis 7 *(H_7)*: For consumers with high sustainability concern, carbon management is positively related with CBBE.

2.2.8 Corporate Social Responsibility

Companies are driven by profit, especially in the United States where traditionally the shareholders are the most important stakeholders, and thus maximizing profit means content shareholders. However, companies also have a social and environmental responsibility as seen from the TBL framework and TNSF. Grant et al. (2015, 182) argue that companies often forego of environmental and social responsibilities when facing strong competition to stay competitive and thus economic responsibility must be part of corporate social responsibility (CSR). Thus, per Carroll (1979, 500) CSR includes “economic, legal, ethical, and discretionary expectations that society has of organizations at a given point in time.” Moreover, these responsibilities can be ordered in a pyramid (Carroll’s pyramid) with economic responsibilities at the bottom as these form the basis a company is built upon, and philanthropy at the top as companies should be corporate citizens that are respectable (Grant et al. 2015, 183). Therefore, if a company wants to fulfil all its social responsibilities, it should generate profit, follow the law, act ethically, and finally donate to society, or help society through other means.

The term ‘acting ethically’ must be analysed further, because without additional scrutiny it is nothing more than a catchphrase. Beauchamp and Bowie (1983, 3) define ethics as the “inquiry into theories of what is good and evil and into what is right and wrong, and into what we ought and ought not to do.” Per Grant et al. (2015, 189) there are many ethical frameworks and they can be divided between consequential theories and nonconsequential theories, or a combination thereof. Theories either deal with maximizing the positive consequences of one’s actions or with social norms and rules, or a combination of both. Thus, per Grant et al. (2015, 190) managers must consider the effects of

their actions and behave with integrity while maximizing revenues. Unfortunately, not all managers are moral; child labour, denying freedom of association, extremely long working hours under poor conditions, and bribery are all examples of immoral acts committed by businesses. To minimize amoral acts, it is important that companies imbue their organization, as well as their suppliers, with a corporate social responsibility culture (Grant et al. 2015, 191). Consequently, companies have developed codes of conduct for their employees to act by (ibid.). Moreover, such codes of conduct have also been designed on a global and industry wide level, for instance the UN Global Compact, the GRI, and the ILO's labour principles.

A positive relation between CSR and brand image has already been established. In his research, Grover (2014, 108) concludes that CSR is positively related with brand image, and in fact all the antecedents of brand image (perceived quality, brand loyalty and brand awareness), and thus companies should use CSR to give their brands more visibility. Similarly, Luo and Bhattacharya (2006, 14–15) conclude that CSR leads to increased customer satisfaction. Furthermore, Aaker (1996, 40) argues that satisfied customers are unlikely to switch brand and are increasingly loyal. Moreover, a strong relation between satisfaction and brand equity was already established earlier in this research. Consequently, because brand image and brand loyalty are antecedents of CBBE, this research suggests the following hypothesis:

Hypothesis 8 *(H_8)*: For consumers with high sustainability concern, CSR is positively related with CBBE.

2.3 Sustainability and branding

The previous chapters discussed several practices all throughout the supply chain to increase the sustainability of a product. The advantages for a brand that adopts these sustainability practices vary from reputation benefits to increased customer loyalty. Similarly, Kumar and Christodoulopoulou (2014, 13) argue that brands gain increased value when communicating their sustainability efforts to various stakeholders. Hitchcock and Willard (2015, 212) come to a similar conclusion. This positive PR is a strong source of CBBE. The advantages of sustainability do not end there however. Hitchcock and Willard

(2015, 213) also suggest that those brands that adopt sustainability first, gain considerable first mover advantages. Adopting sustainability can also lead to product differentiation advantages (ibid.). In both cases the brand will have a strong competitive advantage, and increased brand equity.

Companies must however choose between creating an entirely new sustainable brand or greening an existing brand. Peattie (1995, 166) argues that new brands face strong competition from already established brands that often can defend their position by greening up their own brand to fend off sustainable newcomers. Instead, Peattie (ibid.) argues that the best method of sustainable branding is to brand the company instead of the individual products. These company brands communicate their dedication to sustainability through their vision and mission statement, their values, and their offerings. Ultimately, the final consumer trusts the company to deliver sustainable products which leads to increased loyalty towards the company, and thus the brand. Moreover, Aaker (1996, 83) states that organizational attributes lead to a much stronger competitive advantage as they are much harder to copy by competitors than just brand attributes. Thus, an organizational brand allows a company to deliver green products while fending off the established competition.

Finally, companies must decide whether to publicly announce their sustainability efforts. As seen before, actively engaging in stakeholder dialogue can lead to increased CBBE. However, Hitchcock and Willard (2015, 213) argue that it is not always beneficial to go public, and it can in fact backfire. Companies must ask themselves whether they have a good story to tell, and how they are faring compared to their competitors (ibid.). Furthermore, they must be absolutely committed to sustainability or risk being accused of green washing, and finally they must make certain they have nothing to hide (ibid.). Thus, some companies, for instance Coca Cola, do not publicly announce their sustainability efforts even though they are actively engaged in becoming more sustainable. Obviously, they miss out on the positive PR and its effect on brand equity but they also do not risk damaging their brands in case their sustainability efforts are not as extensive as the public would like them to be.

2.4 Summary

The main purpose of a brand is to differentiate a company's offerings from those of its competitors. Thus, brands have inherent value or so called brand equity. Customer-based brand equity is the positive, or negative, effect of a company's marketing efforts due to the consumer's knowledge of a brand (Keller 1993, 2). It consists of a group of assets, or liabilities, that are connected to the name or symbol of the brand (Aaker 1991, 15–16; 1996, 7–8. These assets are: brand awareness, perceived quality, brand associations, brand loyalty, and other proprietary brand assets. Consequently, these assets can be leveraged to increase the value of a brand.

Despite increasingly global supply chains, customers are becoming more and more aware, and critical, of the pollution caused by companies, even in faraway developing countries. Many firms have started to realize that the negative impact of their business practices has the potential to hurt the value of their brands. Thus, the concept of sustainability has been gaining ground.

Sustainability revolves around not depleting the earth's resources so that future generations will still be able to fulfil their needs (World Commission on Environment and Development 1987, 43). Because this is a vague concept, several frameworks have been developed to further delineate sustainability, such as the triple bottom line; this means creating a situation where the environment, the business and society all win, and not just companies. Consequently, firms are starting to revise their practices with the triple bottom line in mind and are looking for ways to improve their environmental, social and economic performance throughout their organization, and even their entire supply chain.

Companies have many options to become more sustainable throughout their supply chains like for instance selecting the most sustainable suppliers, using renewable energy sources and recyclables, and reducing and redesigning excessive packaging. The effects of these sustainable practices on brand equity vary because some aspects are more visible to the final consumer than others. Moreover, if companies want to reap the benefits of these sustainability improvements they must inform their consumers.

These sustainable practices affect brand equity in several ways. Consumers are becoming increasingly aware of the practices of companies, even in faraway countries. Consequently, PR can play a strong role in developing brand equity because it fosters brand loyalty, and creates strong brand associations. Conversely, firms that do not live up to the environmental and social standards of nowadays consumers can quickly see their brand value erode once consumers become aware of their harmful practices due to negative PR. Ultimately, companies should design more sustainable products. These offerings are designed to be more durable and are produced with better production processes and using less virgin materials while causing less pollution. Moreover, improved product quality is pivotal to perceived quality, which in turn influences brand equity. Although, these products are often priced higher than their non-sustainable counterparts, consumers who care about sustainability are often willing to pay a premium price. This willingness to pay a price premium is an indication of increased brand equity. Consequently, sustainable practices throughout the supply chain should increase brand equity for consumers with high sustainability concern.

3 METHODS

Because brand equity research typically uses a quantitative methodology, a similar approach was used in this research. The unit of analysis in this study was the individual consumer to determine to what extend sustainable practices throughout the supply chain affect CBBE. The sampling frame of this research was that part of the Finnish population that is over 15 years old and a consumer of sportswear and apparel. This industry was specifically chosen because most respondents would be able to relate to it.

An online survey questionnaire (Appendix 2) was used to test the hypotheses in this research. Because getting a large enough sample, that represented the Finnish population was difficult, the questionnaire was spread on as many different Finnish discussion forums as possible over a period of two weeks. To avoid ethical problems the questionnaire was anonymous to preserve the confidentiality of those participating. Moreover, the survey clearly stated that the results were purely for academic research and not for commercial purposes. Because the questionnaire was extensive, and motivating enough people to fill it in was going to be a problem, rewards for filling in the survey completely were promised to three random respondents. These rewards were small and consisted of Spotify and Adlibris coupons.

The survey was translated to Finnish to avoid possible bias. While language skills are not an influential factor in regards to brand equity, there was a good possibility that it is mostly the elderly that do not speak English and as such it would bias the research in favour of younger generations who might think sustainability is more important. Additionally, translating the survey to Finnish eliminated possible misunderstandings and the resulting erroneous answers. To check its validity compared to the English original, the survey questionnaire was translated back to English and compared to the original with satisfactory results. The Finnish version was proofread and tested.

Finally, multiple linear regression was used to test the hypotheses presented in chapter 2 of this study. Further statistical analysis, in the form of correlation, both Pearson and Spearman’s rho, and a T-test, were conducted to determine the relationship between certain demographics and sustainable practices. The software used in the analysis was SPSS.

3.1 The sample

The survey was filled in successfully by 116 respondents. Thus, the sample size *n* was 116. Figure 9 shows the gender breakdown of the sample.

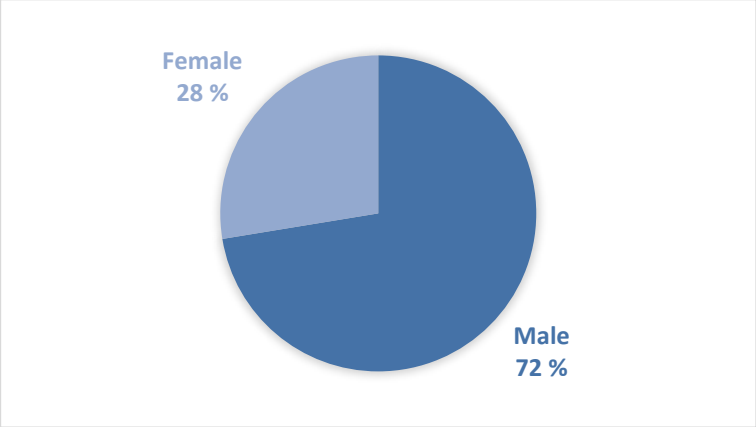

Figure 9. Sample by gender

Out of the 116 respondents 32 were female (28%), and 84 were male (72%). Thus, the sample was considerably skewed towards male respondents as one would expect an equal split. Figure 10 shows the breakdown of the sample by age.

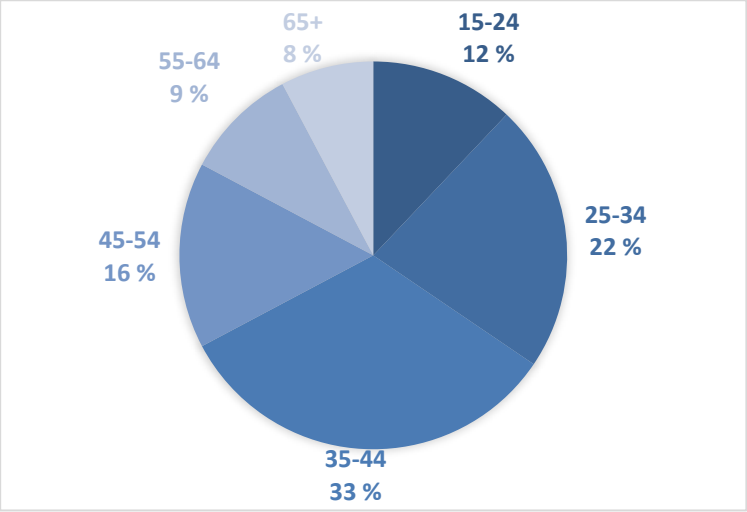

Figure 10. Sample by age

All age groups were represented in the sample but the 35-44 and 25-34 age groups were slightly overrepresented and thus the sample was relatively young; 67% of the respondents were below the age of 44. Finland has an aging society with most members of the population belonging to older age groups. Thus, the sample was slightly skewed towards younger respondents. Next, the education breakdown of the sample is shown in Figure 11.

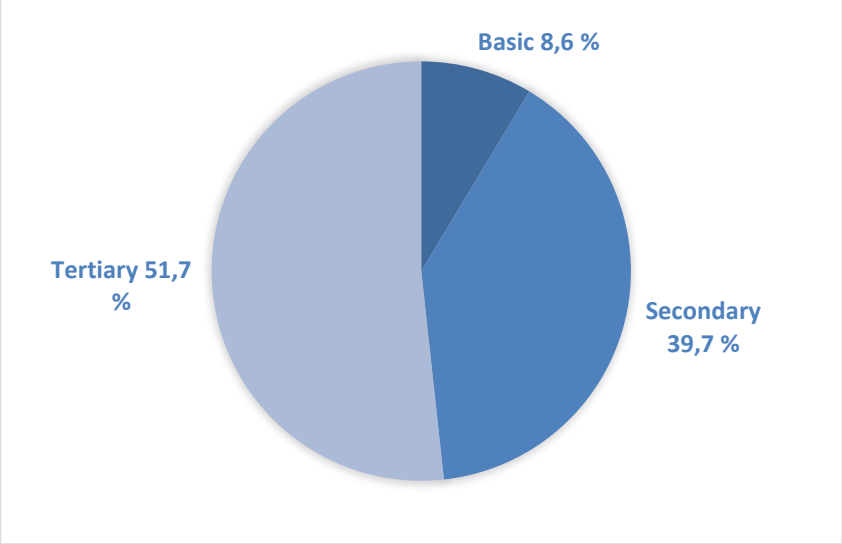

Figure 11. Sample by education

There was a clear bias towards well educated respondents. Sixty of the respondents (52%) claimed to have an upper level degree which is more than half of the sample. Finnish statics (Statistics Finland 2016) shows that roughly eight per cent of the population has a tertiary level degree. However, given the age distribution of the sample, the level of education makes more sense as the largest age group (35-44) in the sample has the highest proportion of tertiary level degrees (41,3%). Finally, Figure 12 shows the breakdown of the sample by monthly gross income.

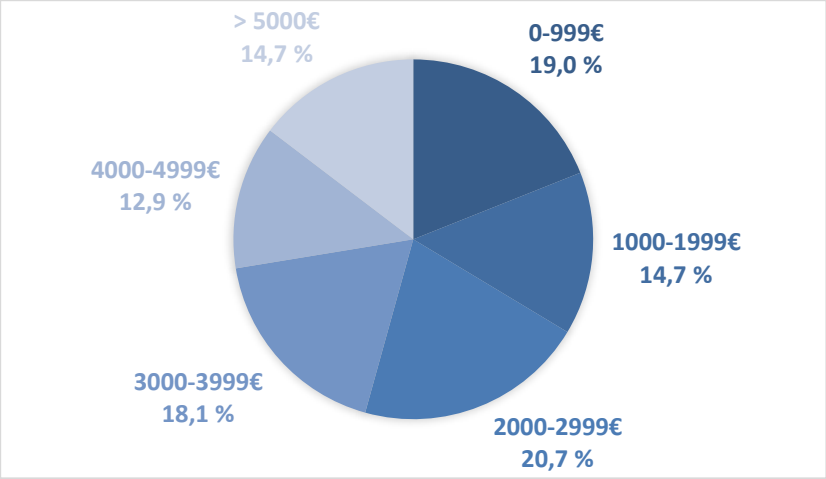

Figure 12. Sample by monthly gross income

The large percentage (19%) of very low income respondents might indicate that a large share of the respondents was student. However, only nine respondents claimed to be a student. The other respondents that most likely belonged to this group were retirees (five respondents) or unemployed. Since only 88 respondents filled in their occupation, it was not possible to fully analyze this group of respondents. Nevertheless, the sample had a good representation of all income groups.

Thus, some of the data was clearly skewed, especially education and most predominantly gender. To compensate for the extreme bias towards male respondents the data was weighted to make the data representative of the entire Finnish population, and consequently compared to a non-weighted sample for triangulation reasons. No significant differences in the results were found between the weighted and non-weighted sample. Because the other skewed variables, age and education, showed no strong correlation with sustainable practices nor brand equity, no additionally weighting was considered. The weighting is further explained in Appendix 1.

The observed skewedness of the sample was caused by the method of distribution of the questionnaire. Because people who visit discussion forums are not entirely representative of the Finnish population; the older generation is less likely to use the internet to communicate and thus the sample was not truly random.

3.2 The survey questionnaire

The survey contained four sections. In the first section, demographic questions were asked while in the second section, four questions were asked to establish purchasing recency, frequency and monetary value (RFM), and spending habits, for triangulation reasons. These RFM questions were simple dichotomous “yes” or “no” questions. However, no correlation was found between RFM and sustainable practices, nor between money spent on sportswear and apparel, and sustainable practices. In the third section of the survey, questions were asked about the brand equity of an abstract brand.

The questions about brand equity were based on questionnaires designed by Pappu and Quester (2006a, 325) and Pappu, Quester and Cooksey (2005, 149), and Lassar, Mittal and Sharma (1995, 16). To reduce the large number of questions needed for measuring the brand equity of multiple brands, an abstract brand was used instead. This also had the advantage that the questions measured the effect of sustainable practices without possible brand bias that might have been the case when using, for instance, real brands like Nike or Adidas. To describe this brand a vignette method was used, and this hypothetical brand was described in detail in the survey. Most of the questions in this section used a Likert scale of 1-5 with a one representing ‘totally disagree’ and a five representing ‘totally agree’. However, some of the questions regarding brand associations and perceived quality were designed with a five-point semantic differential scale instead. The reason for this design choice was that these questions were well suited for this method; especially in the Finnish language where good and bad quality are one word. Moreover, because both Likert scale and semantic differential scale are interval data the results could be combined to get a total value for brand equity. In the final section questions were asked regarding sustainable practices. These items were also measured with a five point Likert scale.

3.3 Explanation of the constructs

To measure CBBE, the construct was divided into four separate parts: brand awareness, brand associations, perceived quality, and brand loyalty (Figure 13). These parts corresponded with Aaker’s definition (1991, 16) of customer

based brand equity. Five questions, two related to perceived quality and three related to brand associations, in this section used a five-point semantic differential scale while the rest of the questions used a five point Likert scale. As previously noted the data of these two scales is similar and thus did not interfere with the evaluation of the CBBE construct. Moreover, brand equity was calculated by averaging the scores of its four antecedents: brand awareness, brand associations, perceived quality and brand loyalty.

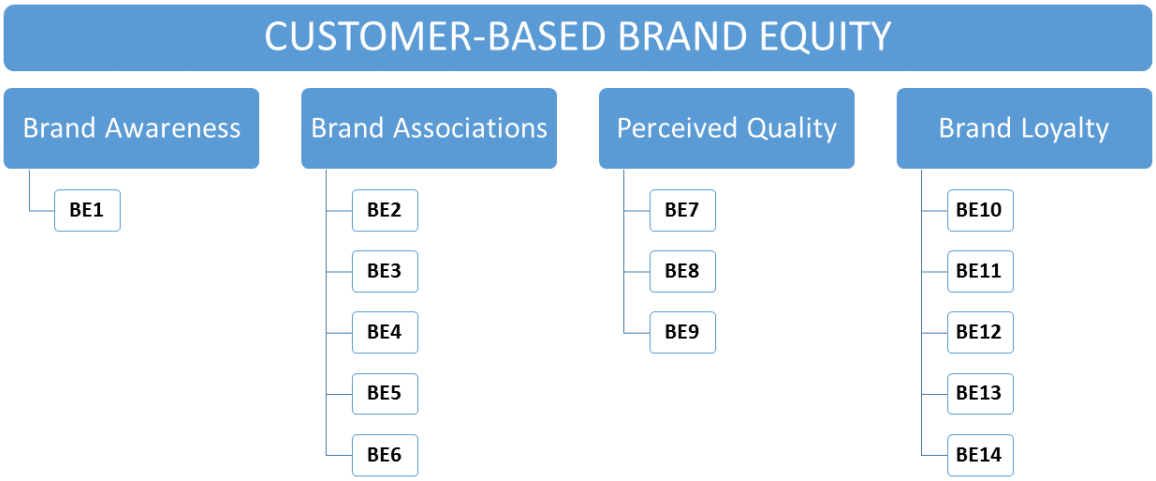

Figure 13. The brand equity construct was calculated by averaging the scores of brand awareness, brand associations, perceived quality and brand loyalty

Similarly, the sustainable practices construct (Figure 14) was divided into eight separate constructs representing sustainable practices throughout the supply chain as described in chapter 2. These eight parts were: procurement, logistics, production, packaging, reverse logistics, marketing, carbon management, and CSR. Most of the questions in this part of the survey involved a value judgement between two alternatives, and all questions used a five point Likert scale. The constructs were calculated by averaging the results of the items it was made of. Consequently, all values ranged from 1 to 5.

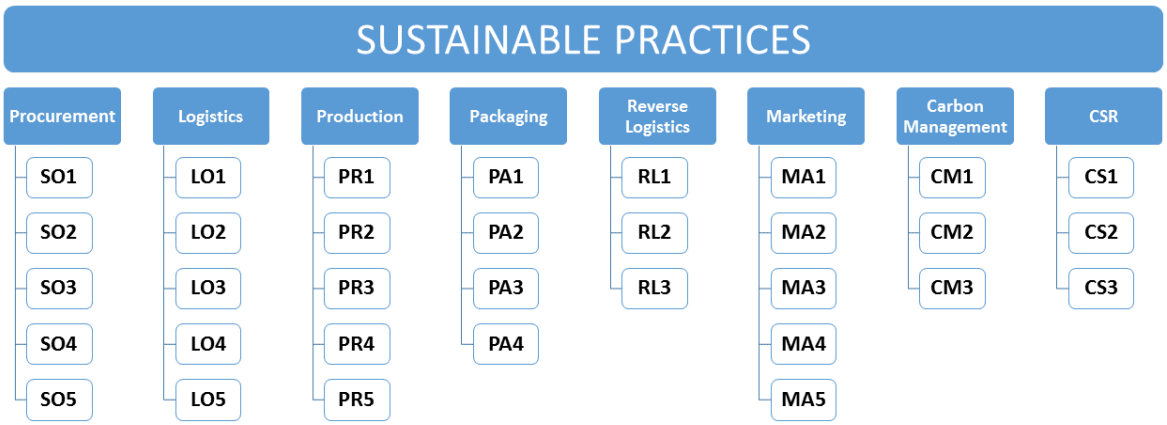

Figure 14. The sustainable practices construct was calculated by averaging the scores of its eight subconstructs

Figure 13 and Figure 14 display the breakdown of the constructs into their separate variables. The corresponding survey questions for the CBBE and sustainable practices constructs can be found in Appendix 2. To increase readability, these questions were similarly labelled as the variables in Figure 13 and Figure 14.

3.4 Data screening and assumptions

After the collection of the data, it was screened for missing values and outliers. Two missing values were found in one questionnaire. The items that were not answered were two RFM questions and the lack of these results had no impact on any of the analyses conducted because, as established earlier, there was no correlation between RFM and sustainable practices nor brand equity, and the RFM data was not used in any further analysis.

Several outliers were found when screening the data. These outliers were further analysed by comparing the mean of the variable with the 5% trimmed mean to determine whether these outliers caused severe changes in the mean (Table 3).

Table 3. Comparison of the mean with the trimmed mean to check if outliers were significantly influencing the results

Variable	Mean	5% Trimmed Mean
BE	3,37	3,39
SO	3,34	3,36
LO	3,26	3,29
PR	3,12	3,12
PA	3,30	3,32
RL	3,52	3,54
MA	3,30	3,32
CM	3,42	3,45
CSR	3,81	3,85
SUS_PRAC	3,38	3,40

None of the trimmed means varied significantly from the normal mean (including the outliers), thus Pallant (210, 64–65) argues that these cases do not need to be removed from the data file nor need to be edited. Moreover, none of these outliers were incorrectly entered data. The next chapter will go in more detail regarding specific outliers identified during the multiple regression.

The statistical analyses used in this research required the data to be parametric. Field (2009, 133) states that parametric data must meet the following four assumptions: the data must be normally distributed, it must show homogeneity of variance, it must be interval data, and finally it must be obtained from independent respondents.

First, the data was checked for normality. Field (2009, 138–139) states that the converted *z*-scores for skewness and kurtosis should ideally be below 2,58 for large samples. Skewness is an indication of groupings of data to either side of the distribution, while kurtosis measures the height of the distribution and its tail (ibid.) and ideally these values should be close to zero. Table 4 gives an overview of the converted *z*-scores for skewness and kurtosis.

Table 4. Values for Kurtosis and Skewness with potential problems highlighted in red

Variable	Skewness			Kurtosis		
	S	SE	z	S	SE	z
BE	-0,554	0,225	-2,47	0,241	0,446	0,54
SO	-0,267	0,225	-1,19	-0,045	0,446	-0,10
LO	-0,590	0,225	**-2,63**	0,376	0,446	0,84
PR	0,093	0,225	0,41	-0,108	0,446	-0,24
PA	-0,371	0,225	-1,65	-0,241	0,446	-0,54
RL	-0,476	0,225	-2,12	-0,541	0,446	-1,21
MA	-0,580	0,225	-2,58	0,338	0,446	0,76
CM	-0,485	0,225	-2,16	0,026	0,446	0,06
CSR	-0,539	0,225	-2,40	0,094	0,446	0,21
SUS_PRAC	-0,445	0,225	-1,98	0,203	0,446	0,46

The *z*-scores for skewness and kurtosis were calculated by dividing the statistic S by the standard error SE. Only one of the skewness values (LO) was above 2,58 but it was well below the upper threshold of 3,29 as stated by Field (2009, 139). All the kurtosis values were well within in range of a normal distribution. Thus, the data was not overly skewed. Besides, Tabachnick and Fidell (2007, 80) argue that with relatively large sample sizes neither skewness nor kurtosis will significantly influence the final analysis.

To further test for normality, a Kolmogorov-Smirnov test was conducted (Table 5). All the tests, apart from the final variable SUS_PRAC, were significant ($p < 0,05$). Thus, the null hypothesis was confirmed for all variables but SUS_PRAC and the data deviated from normality. However, Pallant (2010, 63) states that large sample sizes often lead to significant results and thus violation of the assumption of normality. Therefore, in the case of a large sample size it is better to examine the shape of the distribution instead (Tabachnick & Fidell 2007, 81).

Table 5. The results from the Kolmogorov-Smirnov normality test

Variable	Kolmogorov-Smirnov		
	Statistic	df	Sig.
BE	0,107	116	0,002
SO	0,083	116	0,047
LO	0,109	116	0,002
PR	0,095	116	0,011
PA	0,094	116	0,014
RL	0,136	116	0,000
MA	0,123	116	0,000
CM	0,117	116	0,001
CSR	0,122	116	0,000
SUS_PRAC	0,075	116	0,151

Next, the histograms of all ten variables were examined and all showed relatively normal shaped distributions. Thus, it was supposed that the data did not violate the assumption of normality.

Because no groups of different data sets were collected, the assumption of homogeneity of variance was met by default. Similarly, since a Likert scale and a semantic differential scale was used in the questionnaire to measure brand equity and sustainable practices, the data used in the analysis was interval data.

Finally, the assumption of independence was met due to the nature of the questionnaire and its online distribution. Respondents were not in contact when filling in the questionnaire and thus the responses were collected independently from each other. However, it must be noted that the sample was not truly random due to method of distribution of the questionnaire (see 3.1).

3.5 Multiple regression

Multiple regression was used to test the hypotheses from chapter 2. In addition to the assumptions for parametric data mentioned in the previous chapter, multiple regression required an additional set of assumptions that needed to

be satisfied. Berry cited in Field (2009, 220–221) lists the following assumptions:

- Variable types
- Variance not equal to zero
- Perfect multicollinearity should not exist
- No correlation between predictors and external variables
- Homoscedasticity
- Independent errors
- Distribution of errors is normal
- Independent variables
- Linearity

The multilinear regression conducted in this research met all assumptions. First, all the variables used in the regression were continuous. Next, scatter plots of the residuals were checked for heteroscedasticity, and the outcome plot and normal probability plot were checked for normality. None of the plots showed abnormal behaviour and thus normality and homoscedasticity were assumed. Bowerman and O'Connell cited in Field (2009, 242) state that collinearity might be a problem if the largest VIF value is above 10. Pallant (2010, 158) comes to a similar conclusion but also states that tolerance values should be above 0,1. No severe collinearity was detected as the VIF values of the final model were all far below 10 and the values for tolerance well above 0,1. Additionally, the Durbin-Watson value from the regression was 2,235 and well in range to confirm independent errors (Field 2009, 221).

Additionally, the regression highlighted eight outlier cases. Outliers were identified when their value was outside two times the standard deviation from the mean, instead of three, to err on the side of caution. Next, their residual statistics were examined to determine their influence and leverage on the regression result. None of these cases showed Cook's distance values over 1 or Mahalanobis values over 15 and thus, per Field (2009, 245) were not influential cases. Similarly, standardized DFBeta values for these cases were studied to check if any value was higher than 1 and thus had a large influence (Field 2009, 245–246). None of the identified extreme cases showed values above 1 (Table 6).

Table 6. Outliers in the regression that required further inspection with the potential problem cases highlighted in red

ID	Mahalanobis Distance	Cook's Distance	Leverage Value	DFBETA Intercept	Standardized DFBETA SO	Standardized DFBETA PR	Standardized DFBETA RL
14	5,006	0,062	0,044	0,112	-0,332	0,392	-0,196
24	1,325	0,023	0,012	0,215	0,094	-0,199	-0,016
38	4,081	0,161	0,035	0,362	0,081	0,297	-0,749
62	1,112	0,044	0,010	-0,309	-0,115	0,120	0,212
70	2,069	0,031	0,018	-0,287	-0,101	0,218	0,066
90	12,695	0,220	**0,110**	-0,239	-0,708	0,166	0,770
105	0,856	0,022	0,007	-0,012	-0,089	0,168	-0,148
108	3,057	0,049	0,027	0,138	0,312	-0,269	-0,181

Moreover, the cases were checked for leverage, and even though one case showed a high centred leverage value (0,110), it had no extreme influence values. Thus, it was assumed that none of the outlier cases had an unproportionate large effect on the regression and no further action was taken.

Finally, the minimum sample size for regression was determined. Green cited in Field (2009, 222), argues that to test the model, a minimum sample size of $50 + 8k$ is required, where k is the number of predictors, and for testing the individual predictors a minimum sample size of $104 + k$ is required. Thus, when performing a regression with all eight predictors a minimum sample size of 114 is required. The sample size in this research was 116 and thus sufficient for a regression with all eight predictors. The final regression only featured three predictors and thus the sample size was more than adequate.

First, a regression was conducted with all eight variables that constitute sustainable practices. This regression was performed both as a standard multiple linear regression and stepwise with the same results. Next, a regression was performed with only the significant variables in the model. Finally, this result was compared between the unweighted and weighted sample with similar results. This comparison was done for triangulation reasons. Moreover, the unweighted sample, with male respondents overrepresented, tended towards an extra significant result for packaging. Consequently, a further regression on only the male population was conducted to test this result. Furthermore, because there were 84 male respondents the sample size was large enough to

perform a regression with four dependent variables to test the model. However, it should be noted that the sample size was below the recommended amount for analysing individual predictors. Such a regression was not possible for the female population due to the fact the sample size for females was too small.

3.6 Correlation and T-test

To explore the relationship between different demographics and sustainable practices, either Pearson correlation for continuous or dichotomous variables or Spearman rho for ordinal data, was used. Further tests were conducted to test the nature of the relation of those variables that were correlated. Because, the parametric data requirement was already satisfied in a previous chapter, it was concluded that the data assumptions were met for correlations.

Because the T-test also used parametric data, it was also assumed the data assumptions were met. Moreover, the T-test compared the mean of a continuous dependent variable for two different groups; in this case male and female. Since this test was only performed for gender, this assumption was also met. Finally, the Levene's test to check for equal variances between the two groups was not significant and thus the null hypothesis was rejected, and the variances between the male and female were similar. Thus, the assumption of equal variances for the T-test was met.

3.7 Validity and reliability

Because the brand equity part of the survey was based on previously designed questionnaires specifically intended to measure brand equity, it should have a high level of content validity. Indeed, previous research (Pappu, Quester & Cooksey 2005, 150; Yoo & Donthu 2001, 11) shows that CBBE is constructed from four measurable items, brand awareness, brand associations, perceived quality, and brand loyalty, as Aaker (1991, 16) points out.

Unfortunately, no such previously designed questionnaire existed for testing sustainable practices across a supply chain. However, extensive literature review was used to identify these practices. These then were turned into survey

questions, and adjusted and reordered several times after peer review. As such, it was assumed to have a high level of face validity. However, since no experts on sustainability had been consulted, the content validity was questionable.

Great care should be taken when generalizing the results of this study. Even though the sample was relatively homogenous, there was substantial gender and education bias. However, this bias did not appear to significantly affect the results. Although some differences between men and women were apparent, the number of women respondents was too low to draw further conclusions. Additionally, great differences persist between countries where sustainability is concerned, even within Europe, and especially between developing and developed nations. Thus, generalization of the results across countries is not possible. As such, while the population validity of this research was acceptable, the ecological validity was regrettably questionable.

The reliability of the survey was acceptable to excellent for all constructs apart from CSR (Table 7). Although the Cronbach's alpha for CSR was slightly below the recommended level of 0,7 (Pallant 2010, 100), it was not possible to improve the consistency of this construct by removing items. Thus, the reliability of the CSR construct was questionable.

Table 7. Reliability of the constructs

Constructs		Cronbach's α	Number of items
BA	Brand Awareness		1
BAS	Brand Associations	0,920	5
PQ	Perceived Quality	0,890	3
BL	Brand Loyalty	0,901	5
SO	Procurement	0,839	5
LO	Logistics	0,799	5
PR	Production	0,718	5
PA	Packaging	0,783	4
RL	Reverse Logistics	0,761	3
MA	Marketing	0,853	5
CM	Carbon Management	0,761	3
CSR	CSR	0,683	3

Additionally, the original brand awareness construct showed an unacceptable Cronbach's alpha value. Therefore, per Pappu, Quester and Cooksey (2005, 148), only a single item was used for the measurement of brand awareness and one question (BE2) was removed from the questionnaire. As such, the reliability of the brand awareness construct was assumed to be acceptable.

4 RESULT ANALYSIS

4.1 Results

The aim of this research was to test the relationship between sustainable practices and brand equity to establish whether there was a statistically significant relation. Additionally, this research tried to explore the relationship between specific demographics and sustainable practices throughout the supply chain. For instance, to answer whether males and females differed in their evaluation of these sustainable practices.

To test the first part of the research question, several multiple regressions were conducted. Spearman rho and Pearson correlations were performed to test the relationship between certain demographics and sustainable practices. Finally, a T-test was conducted to determine the difference in means between males and females, and to measure the strength of this difference.

4.1.1 The effect of sustainable practices on brand equity

The results of the multiple regression are shown in Table 8. Sustainable procurement (β = 0,264, t(107)= 2,640, p < 0,05), sustainable production (β = 0,297, t(107)= 3,076, p < 0,01), and reverse logistics (β = 0,278, t(107)= 2,899, p < 0,01) all significantly predicted brand equity. Moreover, all three predictors positively influenced brand equity. Thus, hypotheses H_1, H_3, and H_5 were all confirmed while H_2, H_4, H_6, H_7 and H_8 were rejected.

Table 8. Results from the regression with brand equity as dependent variable with an un-weighted sample

	B	Std. Error	*β*	*t*	Sig.
(Constant)	0,170	0,274		0,619	0,537
SO	0,258	0,098	0,264	2,640	0,010
PR	0,351	0,114	0,297	3,076	0,003
LO	-0,108	0,122	-0,108	-0,886	0,377
PA	0,179	0,093	0,184	1,917	0,058
RL	0,255	0,088	0,278	2,899	0,005
MA	0,035	0,143	0,035	0,247	0,805
CM	-0,053	0,098	-0,058	-0,543	0,588
CSR	0,044	0,078	0,044	0,568	0,571

R Square = 0,635

n = 116

Given the value of R^2, the coefficient of determination, the model was overall a good fit. Table 9 shows the values of the final regression, only incorporating those variables that were significantly predicting brand equity.

Table 9. Results from the regression with brand equity as dependent variable with only the significant variables

	B	Std. Error	*β*	*t*	Sig.
(Constant)	0,300	0,235		1,276	0,204
SO	0,279	0,085	0,284	3,296	0,001
PR	0,345	0,103	0,292	3,357	0,001
RL	0,300	0,070	0,328	4,266	0,000

R Square = 0,617

n = 116

Thus, the three variables sustainable procurement, sustainable production and reverse logistic together explained almost 62% of the variance in brand equity scores. Reverse logistics made the highest unique contribution (*β* = 0,328) to brand equity while sourcing made the lowest unique contribution (*β* =

0,284) of the three variables. Both sustainable procurement and sustainable production had a 3,7% (R^2 = 0,037, F(3, 112) = 60,191, p < 0.001) unique contribution to the variance in brand equity, while reverse logistics uniquely accounted for 6,2% (R^2 = 0,062, F(3, 112) = 60,191, p < 0.001) of the variance in brand equity. Thus, there was a large amount of shared contribution between the three predictors.

As noted in the method section of this research, sustainable packaging showed suggestively differing results between the weighted and unweighted sample, and thus a regression for only males was conducted as well. The results of this regression are shown in Table 10. This regression disclosed that besides sustainable procurement, sustainable production and reverse logistics, sustainable packaging (β = 0,288, t(79)= 3,013, p < 0,01) also significantly predicted brand equity for males and thus confirmed hypothesis H_4 for males but not females.

Table 10. Results from the regression for males with brand equity as dependent variable and with packaging as extra predictor

	B	Std. Error	*β*	*t*	Sig.
(Constant)	-0,022	0,269		-0,080	0,936
SO	0,218	0,093	0,219	2,345	0,022
PR	0,343	0,118	0,268	2,910	0,005
PA	0,283	0,094	0,288	3,013	0,003
RL	0,189	0,091	0,202	2,072	0,041

R Square = 0,675

n = 116

The coefficient of determination for this model was 0,675. Thus, the four variables together explained 67,5% of the variance in brand equity for males. A regression for females was not possible due to a too small sample size.

4.1.2 Demographics and sustainable practices

The correlations between certain demographics and sustainable practices are displayed in Table 11. This study showed no correlation between age, $r(114) = 0,174$, $p = 0,062$, nor income, $r(114) = -0,140$, $p = 0,181$, nor education and sustainable practices, $r(114) = -0,090$, $p = 0,680$.

Table 11. The correlation between demographics and sustainable practices

Variable	Sustainable practices
Gender	-0,261**
Age	0,174
Education	-0,090
Monthly Salary	-0,140

** Correlation is significant at the 0,01 level (2-tailed)

The only correlation found in this study was between gender and sustainable practices, $r(114) = -0,261$, $p < 0,01$. The strength of the relationship between gender and sustainable practices was per Cohen (1988, 79–81) small.

Finally, a T-test was performed to test whether males and females differed significantly regarding their attitudes towards sustainable practices. The test showed a significant difference in the results for males ($M = 3,27$, $SD = 0,675$) and females ($M = 3,67$, $SD = 0,6035$; $t(114) = 2,892$, $p = 0,005$). The magnitude of the differences in the means was calculated by determining eta squared. This value was 0,073 and thus, per Cohen (1998, 284–287) the effect was moderate. Thus, women showed moderately more favourable attitudes towards sustainable practices than men.

4.2 Discussion

This research aimed to determine the effect of sustainable practices all throughout the supply chain on customer-based brand equity, and to explore the relationship between demographics and sustainable practices to establish

what the green customer is like. This study shows that sustainable procurement, sustainable production and reverse logistics all significantly affect brand equity. Surprisingly, for males, sustainable packaging also significantly predicts brand equity but this result cannot be confirmed for females. Additionally, the green consumer can no longer be distinguished as only gender moderately correlates with sustainable practices. The green consumer is no longer just a well-educated, higher income, middle-aged female.

Chen (2009, 316) already established a relation between green brand image and green brand equity. However, his research did not explore the factors affecting green brand image. Therefore, the findings in this study offer new insights in how companies can both increase sustainability and the equity of their brands at the same time. Furthermore, firms often have a short-term vision and sustainable practices require usually large investments. Hence, increased brand equity can be a strong justification for these investments. Consumers care especially about clean production processes, waste management, and social and environmental conditions at suppliers. Thus, companies wanting to transition into becoming more sustainable should focus on those aspects first.

4.2.1 Sustainable practices and customer-based brand equity

This research established a significant positive relation between sustainable procurement and brand equity. Supply chains are becoming increasingly more global and production in the textile industry has largely been offshored to developing countries where enforcement of environmental legislation is lax, and social conditions are often poor. Moreover, consumers are ever more aware of the practices of multinationals abroad as information is nowadays easily accessible. Furthermore, NGOs actively attempt to expose unethical or environmental harmful behaviour of companies. Besides, consumers are becoming increasingly critical of ethical problems, like child labour and forced labour, in the supply chain of multinationals. The uncovering of such practices can lead to seriously harmful negative PR. Moreover, Chunga, Lee and Heath (2013, 438–439) proved in their study that PR affects brand equity, and Aaker (1991, 171) argues that PR is an effective method of establishing brand associations

and increasing brand recognition. Thus, negative PR due to ethical or environmental issues at a firm's suppliers can erode brand equity but it can arguably also increase brand recognition. Resultantly, companies that can prove their dedication to purchasing from suppliers that aim to lessen their impact on the environment and safeguard the rights of all their workers, will reap the rewards of increased brand equity. Consequently, ecolabels like Fairtrade and Rainforest Alliance can function as a strong sustainability signal to the final consumers.

In determining the relation between sustainable production and brand equity, the results of this study suggest that sustainable production is a strong predictor of brand equity for consumers with high sustainability concern (Table 8). Peattie (1995, 166) argues that consumers increasingly buy products from firms that have a sound green record, and clean production processes are ever more important to the final consumer. The World Economic Forum (2009, 11) came to a similar conclusion in their research, and stated that consumers are more and more interested in carbon reductions. Moreover, production causes the vast share of emissions during the lifetime of a product. Thus, sustainable production can lead to a significant reduction of emissions. Besides, it incorporates many concepts to improve production processes, and reduce waste. Additionally, these improved production processes lead to improved product quality, which in turn is an important aspect of perceived quality, an antecedent of brand equity (Aaker 1991, 94). Consequently, companies can benefit greatly from clean production processes. Not only do they increase product quality and reduce waste and emissions, but they can also lead to significant brand equity.

When assessing the relation between reverse logistics and brand equity, the results propose that reverse logistics positively affects brand equity for consumers with high sustainability concern (Table 8). Recycling is an important household activity in Finland as vast amounts of different materials are being recycled. Furthermore, Finns are generally concerned about the environment. Thus, for Finns waste management is important. Moreover, per Weaver (2013), Finland aims to significantly reduce landfilled waste and intents to achieve an over 50% recycling rate of all waste generated by households. However, products made from recycled materials or reused parts might be of

lower quality and thus negatively affect brand equity. Nonetheless, this research shows no evidence that such lower quality negatively affects brand equity. Moreover, perceived quality is not identical to actual quality. Because, consumers have lower expectations of products made from recycled materials, the perceived quality is unaffected. Thus, companies can attain increased brand equity from collecting their end-of-life products and recycling them. Additionally, such activities can lead to positive PR, which, in turn, leads to further increased brand equity.

In their research, the World Economic Forum (2009, 11) found that consumers increasingly care about the carbon footprint of the products they buy, yet this research shows no significant relation between sustainable logistics and brand equity. However, logistics is responsible for only a small share of the emission caused during the lifetime of a product (Figure 4). Thus, consumers see little gains compared to production or reverse logistics. Moreover, many of the methods to increase the environmental performance of logistics are invisible to the final customer. Besides, the LEED and BREAM ecolabels are also still relatively unknown to the public. Additionally, due to the increasingly global supply chains, goods and materials travel vast distances before they arrive at the final consumer. Thus, in the eyes of the consumer, emission reductions in the logistics sector can be gained through local sourcing and therefore reducing the need for extensive logistics in the first place. Not surprisingly, sustainable procurement has a significant positive relation with brand equity while sustainable logistics does not (Table 8). However, Grant et al. (2015, 74–75) argue that environmentally aware consumers are often unaware that local sourcing does not necessarily reduce the carbon footprint of the final product.

When assessing the relation between sustainable marketing and brand equity, the results suggest that sustainable marketing does not significantly affect brand equity (Table 8). Moreover, while Dubey, Gunasekaran, Papadopoulos, Childe, Shibin and Wamba (2016, 8) claimed that DfE leads to increased brand equity, this study did not support that claim. Thus, while DfE enables longer lifecycles, and creates products that are more durable, this does not necessarily facilitate increased brand equity from a consumer point of view. However, this does not necessarily mean consumers do not care about environmentally friendly designed products. Rather, consumers add more value to aspects of the supply chain that are visible to them. However, DfE is still an

important tool to design greener products that use less hazardous and toxic materials and incorporate more recyclables, even though the benefits are not inherently visible to the consumer. Moreover, Hitchcock and Willard (2015, 56) argue that DfE aims to design products so their environmental impact is lessened during both the production and use phase. Consequently, DfE facilitates recycling of materials and reuse of parts, as products are designed for disassembly and recycling after use. Thus, DfE, sustainable production and reverse logistics are strongly interrelated. Therefore, both sustainable production and reverse logistics processes benefit greatly from DfE.

Furthermore, there is a large amount of overlap between sustainable marketing and some of the other practices. Correspondingly, consumers are likely to attribute the use of recyclable material, renewable energy sources and non-toxic materials to other functions in the supply chain, instead of DfE, as the product design process is often not transparent to them. Additionally, while marketing communications can be used to inform the consumer regarding sustainable practices, many companies opt not to disclose this information and even if they do, the consumer does not associate these marketing communications with the true source of sustainability. Rather, they associate the information disclosed, like for instance emission reduction in production through new technologies with the source of sustainability improvements, and therefore as the source of increased brand equity. Thus, while sustainable marketing offers many benefits, green consumers care more about emission reductions and labour conditions, and value those brands higher that actively reduce emissions in their production processes and enforce codes of conduct for their suppliers.

Carbon management, much like sustainable marketing, has a large amount of overlap with the other functions. While carbon management is responsible for managing, and reporting the carbon footprint, the true emission reduction gains are not made by carbon management itself but rather by, for instance improving production processes, optimizing logistics, and introducing reverse logistic networks. Thus, carbon management is the catalyst of sustainability efforts. Moreover, while many companies publish their yearly sustainability reports, not many consumers read these reports. Nor do consumers know about the management processes in place to manage the carbon footprint. Additionally, while companies pay carbon tax or trade in emissions, the final consumer

ends up paying these extra costs for pollution caused by the producer. Therefore, it is unlikely that consumers associate this increased price with brand equity. Thus, while carbon management plays an important role in the reduction of emissions and waste, it functions in the background largely invisible to the consumer and does not generate additional brand equity (Table 8).

Although Grover (2014, 108) discovered that CSR leads to increased brand equity, this study does not confirm that finding (Table 8). While consumers rate CSR the highest of all the sustainable practices, it does not translate into increased brand equity for consumers with high sustainability concern. This discrepancy is caused by the fact that Finnish consumers do not acknowledge CSR as a true source of sustainability, but rather as a prerequisite of a good company. Halkos and Skouloudis (2016, 1155) showed in their research that the level of CSR in Finland is ranked very high globally. This supports the proposition that CSR in Finland is more a prerequisite than an actual source of sustainability and brand equity.

Finally, when assessing the relation between sustainable packaging and brand equity, this research finds conflicting results (Table 10). Keller (2013, 142) and Aaker (1996, 187–188) argue that packaging is a strong driver of brand equity because of its ability to differentiate the product from competing offerings and establish brand associations. But for females such a relation does not exist. However, Heiniö, Arvola, Rusko, Maaskant and Kremer (2016, 5) in their research also found significant differences between the genders; females seemed to be exceedingly concerned with the appearance of the packaging while males with the functionality. Thus, for males, sustainably designed packaging is more functional and hence offers additional value while for females such packaging is often less appealing.

4.2.2 The green consumer

The green consumer is often assumed to be a middle-aged female, who has an above average income and education. However, this research does not confirm this preconception. Moreover, in research conducted in Finland, Rokka and Uusitalo (2008, 522) discovered no differences between any of the demographic variables tested and concluded that these variables are just

weakly correlated with attitudes towards the environment and social conditions.

This research shows that only gender is moderately correlated with sustainable practices with females showing higher sustainability concern. This indicates that the green consumer segment is growing in Finland, and that Finnish consumers generally do care about environmental and social issues. Thus, targeting green consumers is becoming an ever more viable strategy for companies that wish to go green. Resultantly, their green brands will generate additional brand equity. However, because Finland is a small country with a small internal market, segmentation might remain problematic.

5 CONCLUSIONS

The main objective of this study was to determine the relation between sustainable practices and brand equity. Additionally, the aim was also to explore the relation between certain demographics and sustainability. This study found that sustainable procurement, production and reverse logistics all were significantly and positively related with brand equity for consumers with high sustainability concern. Furthermore, only a moderate correlation between gender and sustainability was found; age, education nor income showed a correlation with sustainability. Thus, the green consumer segment is growing and consumers are becoming more aware, and more critical, of environmental and social issues in the supply chains of large multinationals. Moreover, the internet accommodates a free flow of information, and NGOs actively try to uncover unethical practices of companies even in faraway locations. Resultantly, consumers have become more skeptical and have started judging companies more on their actions than their marketing communications. Therefore, PR has started to play a significant role in the perceptions of consumers. Thus, poor social and environmental conditions in the supply chain can have a severe negative impact on brand equity as it facilitates negative brand associations.

Additionally, sustainable packaging is positively related with brand equity for males but not for females. Moreover, females prefer aesthetics over functionality while the reverse holds true for males. As such, sustainable packaging design will require pleasing both genders. Clearly, while sustainable packaging aims at material reduction and the use of recycled materials, this does not mean the packaging must be plain and unappealing. Thus, a well-designed sustainable package should both be environmentally friendly and aesthetically appealing.

This study is an important lesson for companies. Those firms that manage their suppliers and production processes ethically, environmentally and with integrity, while taking care of their products at the end-of-life stage can reap the rewards through increased brand equity among their consumers who value sustainability. Moreover, since the green market is expanding, this offers an ever-growing opportunity for brands. Clearly, cooperating with NGOs and controlling the entire supply chain, even in faraway located developing countries, should be a strong priority of brands in the future. Moreover, as climate

change is increasingly starting to impact the lives of billions of people, so too increases the need to act. Companies, as good corporate citizens, have an important role to play and should start transforming their supply chains for a greener and more sustainable future. While large investments might be a deterrent, the resultant increase in brand equity should be a strong motivator to convince key stakeholders.

Finally, while literature in the past has established links between sustainable activities and brand equity, research in this area has been limited. Previously, Chen (2009, 316) clearly established a positive relation between green brand image and green brand equity but his study did not explore the effects of sustainability efforts on brand image. Instead, it was assumed such a positive relation existed for consumers with high environmental concern. Thus, this study clearly offers new insights in the relation between sustainable practices and brand equity.

5.1 Limitations and suggestions for further research

This study has several limitations. First, brand equity was measured with an abstract brand. While the brand was described in detail in the survey, it nevertheless cannot be compared to real brands. Because the brand does not exist, respondents cannot recognize nor recall it, which severely limits the measurement of brand awareness.

Resultantly, brand awareness was measured with only one item. While Pappu and Quester (2006a, 328) measured brand awareness with more than one question, it was not feasible to use these extra questions in the questionnaire because of the abstract brand. Respondents cannot be expected to answer questions related to the characteristics of a non-existing brand, nor can they be expected to recognize it or be aware of it. However, Pappu et al. (2005, 149) have also successfully measured brand awareness in the past with a single question.

Furthermore, it is doubtful whether respondents can feel loyal to a brand they have never used before. Moreover, Aaker (1991, 41–42) argues that consumers cannot become loyal to a brand unless they have purchased and experienced it. Similarly, Keller (2013, 120) claims that consumers only become truly

loyal when they feel “in synch” with the brand. Thus, at best, respondents are making an educated guess about their potential brand loyalty.

Additionally, it is possible that the description of the sustainable abstract brand introduced bias because similar terms were used in the description of the brand and the questions related to sustainable practices. Thus, high correlation between the constructs could be partly explained because it is measuring similar concepts. Consequently, future research should aim at measuring brand equity of existing brands that are at different stages of sustainability. Furthermore, a longitudinal study of the brand equity of a specific brand should be considered. The aim is to determine the change in brand equity as the company adopts different sustainable practices.

Additionally, to attain greater content validity, factors should be identified and submitted to sustainability experts to filter the most important and relevant questions. Next, factor analysis should be conducted to limit the number of factors per construct to those that significantly represent the construct.

A recent exploratory study by Dubey, Gunasekaran, Papadopoulos, Childe, Shibin and Wamba (2016, 8) established a link between DfE and brand equity but without further evidence of such a link. Because DfE is a part of sustainable marketing in this research, and sustainable marketing showed no significant relation with brand equity, it is assumed that DfE does not affect brand equity. However, it is entirely possible that other aspects of sustainable marketing obfuscate the true effect of DfE on brand equity and thus further research is necessary.

Finally, the use of an online questionnaire, and its method of distribution on Finnish discussion forums, limits the generalizability of the results. While the sample was adjusted to balance the gender bias, other bias in the sample was left untouched. Especially problematic is the small amount of results for females in the older age groups. It was also not possible to perform a meaningful regression for females and further analyse the discrepancy regarding sustainable packaging. However, because no correlation was found between sustainable practices and other demographics, it is assumed to not influence the results and the sample is more diverse than a student sample. Nevertheless, generalizability of the results remains problematic across nations, because attitudes toward sustainability differ greatly between countries. Thus, similar

studies should be conducted in different developing and developed countries; preferably with a large enough sample size to analyse the differences between the genders.

REFERENCES

Aaker, D. A. 1991. Managing Brand Equity. New York: Free Press.

Aaker, D. A. 1996. Building Strong Brands. New York: Free Press.

Agrawal, S., Singh, R. K. & Murtaza, Q. 2015. A literature review and perspectives in reverse logistics. Resources, Conservation and Recycling (97) 76–92. Available at: http://dx.doi.org.xhalax-ng.kyamk.fi:2048/10.1016/j.resconrec.2015.02.009 [Accessed: 29 September 2016].

Beauchamp, T. L. & Bowie, N. E. 1983. Ethical Theory and Business. Maidenhead: Prentice-Hall.

Brito, M. P., Carbone, V. & Blanquart, C. M. 2008. Towards a sustainable fashion retail supply chain in Europe: Organisation and performance. Journal of Production Economics (114), 534–553. Available at: http://dx.doi.org.xhalax-ng.kyamk.fi:2048/10.1016/j.ijpe.2007.06.012 [Accessed: 5 October 2016].

Carroll, A. B. 1979. A three-dimensional conceptual model for corporate social performance. Academy of Management Review (4), 497–505.

Chaudhuri A. & Holbrook, M. B. 2001. The Chain of Effects from Brand Trust and Brand Affect to Brand Performance: The Role of Brand Loyalty. The Journal of Marketing 65 (2), 81–93. Available at: http://www.files.honouroverglory.com/computers/oldpc/desktop/dissertation/journals/1.pdf [Accessed: 10 October 2016].

Chen, Y.-S. 2010. The Drivers of Green Brand Equity: Green Brand Image, Green Satisfaction, and Green Trust. Journal of Business Ethics (93), 307–319.

Christopher, M. 2016. Logistics and Supply Chain Management. 5th edition. Harlow, United Kingdom: Pearson Education Limited.

Christodoulides, G. & De Chernatony, L. 2009. Consumer Based Brand Equity Conceptualization & Measurement: A Literature Review. Available at: https://core.ac.uk/download/pdf/9598321.pdf [Accessed: 11 September 2016].

Chunga, J. Y., Lee, J. & Heath, R. L. 2013. Public relations aspects of brand attitudes and customer activity. Public Relations Review (39), 432–439. Available at: http://dx.doi.org.xhalax-ng.kyamk.fi:2048/10.1016/j.pubrev.2013.05.001 [accessed: 5 October 2016].

Clancy, G., Fröling, M. & Peters, G. 2015. Ecolabels as drivers of clothing design. Journal of Cleaner Production (99), 345–353.

Cohen, J. W. 1988. Statistical Power Analysis for the Behavioral Sciences. 2nd edition. Hillsdale, NJ: Lawrence Erlbaum Associates.

Cullinane, S. 2014. Mitigating the Negative Environmental Impacts of Long Haul Freight Transport. In Macharis, C., Melo, S. & Woxenius (eds.). Transport and Sustainability: Sustainable Logistics, 31–62. Bradford: Emerald Group Publishing Limited.

De Brito, M. P., Carbone, V. & Blanquart, C. M. 2008. Towards a sustainable fashion retail supply chain in Europe: Organisation and performance. Int. J. Production Economics (114) 534–553. Available at: http://dx.doi.org.xhalax-ng.kyamk.fi:2048/10.1016/j.ijpe.2007.06.012 [Accessed: 8 October 2016].

De Brito, M. P. & Dekker, R. 2003. A Framework for Reverse Logistics. Available at: http://ssrn.com/abstract=423654 [Accessed: 4 October 2016].

De Medeiros, J. F., Ribeiro, J. L. D. & Cortimiglia, M. N. 2016. Influence of perceived value on purchasing decisions of green products in Brazil. Journal of Cleaner Production (110), 158–169. Available at: http://dx.doi.org.xhalax-ng.kyamk.fi:2048/10.1016/j.jclepro.2015.07.100 [Accessed: 9 October 2016].

Dubey, R., Gunasekaran, A., Papadopoulos, T., Childe, S. J., Shibin, K. T. & Wamba, S. F. 2016. Sustainable Supply Chain Management: Framework and further research directions. Journal of Cleaner Production, 1–12. Available at: http://dx.doi.org.xhalax-ng.kyamk.fi:2048/10.1016/j.jclepro.2016.03.117 [Accessed: 22 September 2016].

El Haggar, S. 2007. Sustainable Industrial Design and Waste Management: Cradle-to-Cradle for Sustainable Development. Kidlington, US: Academic Press. Available at: http://site.ebrary.com.xhalax-ng.kyamk.fi:2048/lib/kyam/detail.action?docID=10186702 [Accessed: 29 September 2016].

Emmett, S. & Sood, V. 2010. Green Supply Chains. An Action Manifesto. West Sussex: John Wiley & Sons Ltd.

Field, A. 2009. Discovering Statistics Using SPSS. 3rd edition. London: SAGE Publications Ltd.

Garretson, I. C., Mani, M., Leong, S., Lyons, K. W. & Haapala, K. R. 2015. Terminology to support manufacturing process characterization and assessment for sustainable production. Journal of Cleaner Production (139) 986–1000.

Genchev, S. E. 2008. Reverse logistics program design: A company study. Business Horizons (52), 139–148. Available at: http://dx.doi.org.xhalax-ng.kyamk.fi:2048/10.1016/j.bushor.2008.09.005 [Accessed: 2 October 2016].

Grant, D. B., Trautrims, A. & Wong, C. Y. 2015. Sustainable Logistics and Supply Chain Management. Principles and Practices for Sustainable Operations and Management. Revised Edition. London: KoganPage.

Grover, A. 2014. Importance of CSR in Inclusive Development. Procedia - Social and Behavioral Sciences (157) 103–108. Available at: doi: 10.1016/j.sbspro.2014.11.013 [Accessed: 2 October 2016].

Halkos, G. & Skouloudis, A. 2016. National CSR and institutional conditions: An exploratory study. Journal of Cleaner Production (139) 1150–1156. Available at: http://dx.doi.org.xhalax-ng.kyamk.fi:2048/10.1016/j.jclepro.2016.07.047 [Accessed: 18 November 2016].

Halldórsson, Á. & Skjøtt-Larsen, T. 2007. Design of Reverse Supply Chains: Centralized or Decentralized Structure. In De Koster, R. & Delfmann, W. (eds.). Managing Supply Chains Challenges and Opportunities. Copenhagen, Denmark: Copenhagen Business School Press. Available at:

http://site.ebrary.com.xhalax-ng.kyamk.fi:2048/lib/kyam/reader.action?docID=10465554 [Accessed: 29 September 2016].

Heiniö, R.-J., Arvola, A., Rusko, E., Maaskant A. & Kremer, S. 2016. Ready-made meal packaging - A survey of needs and wants among Finnish and Dutch 'current' and 'future' seniors. Food Science and Technology 1–7.

Hitchcock, D. & Willard, M. 2015. The Business Guide to Sustainability. Practical Strategies and Tools for Organizations. New York: Routledge.

Keller, K. L. 1993. Measuring, and managing customer-based brand equity. Journal of Marketing (1), 1–22.

Keller. K. L. 2001. Building Customer-Based Brand Equity: A Blueprint for Creating Strong Brands. Available at: http://www.academia.edu/download/40863813/CustomerBasedbrandEquityModel.pdf [Accessed: 15 October 2016].

Keller, K. L. 2013. Strategic Brand Management. Building, Measuring, and Managing Brand Equity. 4th edition. Essex: Pearson Education Limited.

Khor, K. S., Udin, Z. M., Ramayah, T. & Hazen, B. T. 2016. Reverse logistics in Malaysia: The Contingent role of institutional pressure. Int. J. Production Economics (175) 96–108. Available at: http://dx.doi.org.xhalax-ng.kyamk.fi:2048/10.1016/j.ijpe.2016.01.020 [Accessed: 2 October 2016].

Kotler, P. 2011. Reinventing Marketing to Manage the Environmental Imperative. Journal of Marketing (75), 132–135.

Kumar, V. & Christodoulopoulou, A. 2014. Sustainability and branding: An integrated perspective. Industrial Marketing Management (43), 6–15. Available at: http://dx.doi.org.xhalax-ng.kyamk.fi:2048/10.1016/j.indmarman.2013.06.008 [Accessed: 7 October 2016].

Kumar, D. & Rahman, Z. 2016. Buyer supplier relationship and supply chain sustainability: Empirical study of Indian automobile industry. Journal of Cleaner Production (131), 836–848.

Lassar, W. Mittal, B. & Sharma, A. 1995. Measuring customer-based brand equity. Journal of Consumer Marketing (12) 4, 11–19. Available at: http://dx.doi.org/10.1108/07363769510095270 [Accessed: 10 October 2016].

Lewis, H., Gertsakis, J., Grant, T., Morelli & Sweatman, A. 2001. Design + Environment. A global guide to designing greener goods. Sheffield: Greenleaf Publishing Limited. Available at: http://site.ebrary.com.xhalax-ng.kyamk.fi:2048/lib/kyam/reader.action?docID=10650063 [Accessed: 3 October 2016].

Luo, X. & Bhattacharya, C. B. 2006. Corporate Social Responsibility, Customer Satisfaction, and Market Value. Journal of Marketing (70) 4, 1–18. Available at: https://faculty.fuqua.duke.edu/~moorman/Marketing-Strategy-Seminar-2015/Session%2012/Luo%20and%20Bhattacharya%202006.pdf [Accessed: 7 October 2016].

Macchion, L., Moretto, A., Caniato, F., Caridi, M., Danese, P. & Vinelli, A. 2015. Production and supply network strategies within the fashion industry. Int. J. Production Economics (163) 173–188.

Magnier, L. & Schoormans, J. 2015. Consumer reactions to sustainable packaging: The interplay of visual appearance, verbal claim and environmental concern. Journal of Environmental Psychology (44), 53–62. Available at: http://dx.doi.org.xhalax-ng.kyamk.fi:2048/10.1016/j.jenvp.2015.09.005 [Accessed: 25 September 2016].

Martin, D. & Schouten, J. 2014. Sustainable Marketing. Essex: Pearson Education Limited.

Martinho, G., Pires, A., Portela, G. & Fonseca, M. 2015. Factors affecting consumers' choices concerning sustainable packaging during product purchase and recycling. Resources, Conservation and Recycling (103), 58–68. Available at: http://dx.doi.org.xhalax-ng.kyamk.fi:2048/10.1016/j.resconrec.2015.07.012 [Accessed: 25 September 2016].

McBride, S. 2012. Recycling Reconsidered. The Present Failure and Future Promise of Environmental Action in the United States. Massachusetts: The MIT Press. Available at: http://site.ebrary.com.xhalax-ng.kyamk.fi:2048/lib/kyam/reader.action?docID=10528245 [Accessed: 24 September 2016].

Molina-Besch, K. & Pålsson, H. 2014. Packaging for Eco-Efficient Supply Chains: Why Logistics Should Get Involved in the Packaging Development Process. In Macharis, C., Melo, S. & Woxenius (eds.). Transport and Sustainability: Sustainable Logistics, 137–164. Bradford: Emerald Group Publishing Limited. Available at: http://site.ebrary.com.xhalax-ng.kyamk.fi:2048/lib/kyam/reader.action?docID=11001418 [Accessed: 26 September 2016].

Nagurney, N. & Yu, M. 2012. Sustainable fashion supply chain management under oligopolistic competition and brand differentiation. Journal of Production Economics (135), 532–540.

Nazari, E., Ghasemi, B. & Saeidi, S. S. 2015. Explain The Relationship Between Green Brand Image, Green Satisfaction and Green Trust and Factors Affecting on Green Brand Equity. Bulletin of the Georgian National Academy of Sciences (9) 1, 487–494. Available at: http://bnas.org/Science/2015/Vols.%209,%20N1/494.pdf [Accessed: 21 October 2016].

Pallant, J. 2010. SPSS Survival Manual. 4th edition. Berkshire, England: Open University Press.

Pappu, R. & Quester, P. 2006a. A consumer-based method for retailer equity measurement: Results of an empirical study. Journal of Retailing and Consumer Services (13), 317–329. Available at: http://doi:10.1016/j.jretconser.2005.10.002 [Accessed: 10 October 2016].

Pappu, R. & Quester, P. 2006b. Does customer satisfaction lead to improved brand equity? An empirical examination of two categories of retail brands. Journal of Product & Brand Management (15) 1, 4–14. Available at: http://espace.library.uq.edu.au/view/UQ:78763/Ravi_Pappu_article_3.pdf [Accessed: 15 October 2016].

Pappu, R., Quester, P. G. & Cooksey, R. W. 2005. Consumer-based brand equity: improving the measurement – empirical evidence. Journal of Product &

Brand Management (14) 3, 143–154. Available at: http://dx.doi.org.xhalax-ng.kyamk.fi:2048/10.1108/10610420510601012 [Accessed: 10 October 2016].

Peattie, K. 1995. Environmental Marketing Management. Meeting the Green Challenge. London: Pitman Publishing.

Peattie, K. & Charter, M. 2003. Green Marketing. In Baker, M. (ed.). The Marketing Book, 726–756. Oxford: Butterworth-Heinemann.

Peters, G. P. 2010. Carbon footprints and embodied carbon at multiple scales. Current Opinion in Environmental Sustainability (2) 4, 245–250.

Ramseur, J. L. & Parker, L. 2010. Carbon Tax and Greenhouse Gas Control: Options and Considerations for Congress. In Burney, N. E. (ed.). Carbon Tax and Cap-and-trade Tools. New York, US: Nova. Available at: http://site.ebrary.com.xhalax-ng.kyamk.fi:2048/lib/kyam/detail.action?docID=10662877 [Accessed: 30 September 2016].

Rokka, J. & Uusitalo, L. 2008. Preference for green packaging in consumer product choices – Do consumers care? International Journal of Consumer Studies (32), 516–525. Available at: http://onlinelibrary.wiley.com/doi/10.1111/j.1470-6431.2008.00710.x [Accessed: 15 October 2016].

Roosa, S. A. & Jhaveri, A. G. 2010. Carbon Reduction: Policies, Strategies and Technologies. Lilburn, US: The Fairmont Press, Inc. Available at: http://site.ebrary.com.xhalax-ng.kyamk.fi:2048/lib/kyam/reader.action?docID=10849107 [Accessed: 1 October 2016].

Santos, J., Wysk, R. A. & Torres, J. M. 2006. Improving Production with Lean Thinking. New Jersey: John Wiley & Sons, Inc.

Sroufe, R. & Sarkis, J. 2007. Strategic Sustainability: The State of the Art in Corporate Environmental Management Systems. Sheffield, GB: Greenleaf Publishing. Available at: http://site.ebrary.com.xhalax-ng.kyamk.fi:2048/lib/kyam/reader.action?docID=10650122 [Accessed: 1 October 2016].

Stafford, E. R. & Hartman, C. I. 2013. Promoting the Value of Sustainably Minded Purchase Behaviors. Marketing News (47) 1, 28-33. Available at: http://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=1187&context=manage_facpub [Accessed: 18 November 2016].

Statistics Finland 2016. Educational qualifications highest among persons aged 40 to 44 in 2015. Available at: http://www.stat.fi/til/vkour/2015/vkour_2015_2016-11-03_tie_001_en.html [Accessed: 3 November 2016].

Tabachnick, B. G. & Fidell, L. S. 2007. Using Multivariate Statistics. 5th edition. Mahwah, NJ: Lawrence Erlbaum.

Turker, D. & Altuntas, C. 2014. Sustainable supply chain management in the fast fashion industry: An analysis of corporate reports. European Management Journal (32), 837–849.

World Commission on Environment and Development 1987. Our Common Future. The Brundtland Report. Oxford: Oxford University Press.

Weaver, F. 2013. this is Finland. Finnish Families Get to Grips with Trash. Available at: https://finland.fi/life-society/finnish-families-get-to-grips-with-trash/ [Accessed: 16 November 2016].

Winter, S. & Lasch, R. 2016. Environmental and social criteria in supplier evaluation – lessons from the fashion and apparel industry. Journal of Cleaner Production (139), 175–190.

World Economic Forum 2009. Supply Chain Decarbonization the Role of Logistics and Transport in Reducing Supply Chain Carbon Emissions. Available at: http://www3.weforum.org/docs/WEF_LT_SupplyChainDecarbonization_Report_2009.pdf [Accessed: 23 September 2016].

Yoo, B. & Donthu, N. 2001. Developing and Validating a Multidimensional Consumer-Based Brand Equity Scale. Journal of Business Research (52), 1–14.

Zeithaml, V. A. 1988. Consumer Perceptions of Price, Quality, and Value: A Means-End Model and Synthesis of Evidence. Journal of Marketing (52) 3, 2–22.

FIGURES

SURVEY WEIGHTING

To balance the skewedness of the sample in regards to gender and test whether this skewedness affected the results, a weighting was used to get a near fifty per cent split between male and female. While some of the other demographics were also skewed, especially education, they did not have any correlation with sustainable practices nor brand equity and thus no weighting was introduced to offset this skewedness.

The original sample contained 28 % female and 72 % male respondents. Table 12 shows the calculation of the weightings to remove the gender bias from the sample.

Table 12. Calculating weightings to remove gender bias from sample

Gender	Population	Sample	Weight
Male	0,5	0,72	0,69
Female	0,5	0,28	1,79

The weight was calculated by dividing the population fraction by the sample fraction. Thus, a male respondent's answers are multiplied by 0,69, while a female respondent's answers are multiplied by 1,79. Figure 15 displays the new gender breakdown of the sample after the weighting was applied in SPSS.

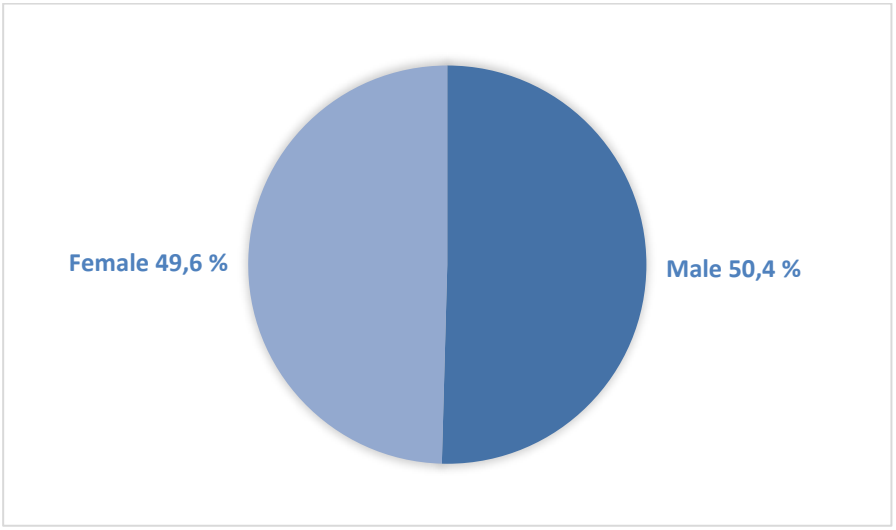

Figure 15. Gender breakdown of sample after applying weighting

After applying the weights from Table 12, the sample consisted effectively of 57 female respondents and 58 male respondents and thus is representative of the Finnish population. Figure 16 shows the new age breakdown of the sample.

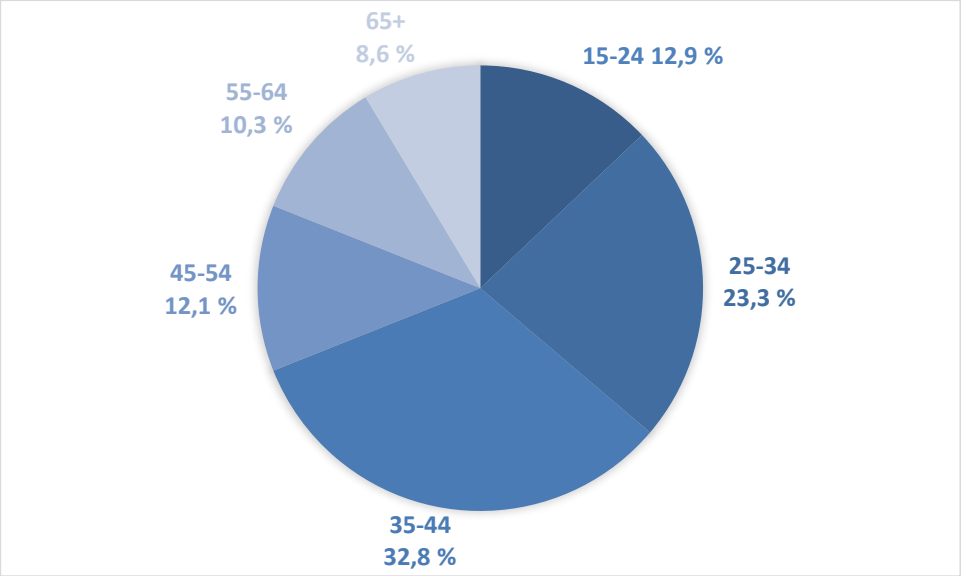

Figure 16. Age breakdown of sample after removing gender bias

Because there were very little women in the older age groups, the new sample was skewed towards the younger generation. Almost 70% of the sample was below the age of 44.

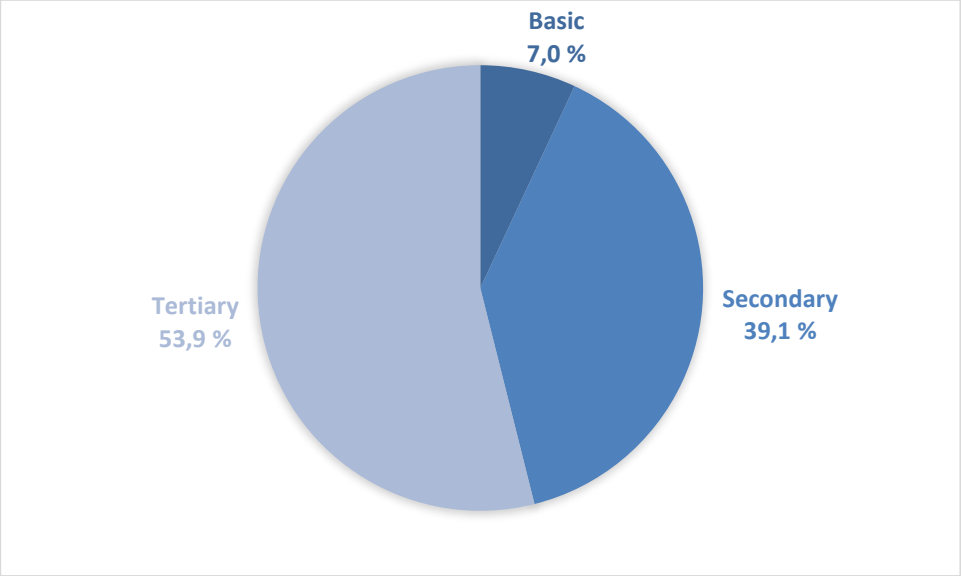

Figure 17. Education breakdown of sample after removing gender bias

The education breakdown of the sample was near enough the same as before weighting and over 50% of the respondents had a tertiary degree. Similarly, income was also quite evenly divided (Figure 18).

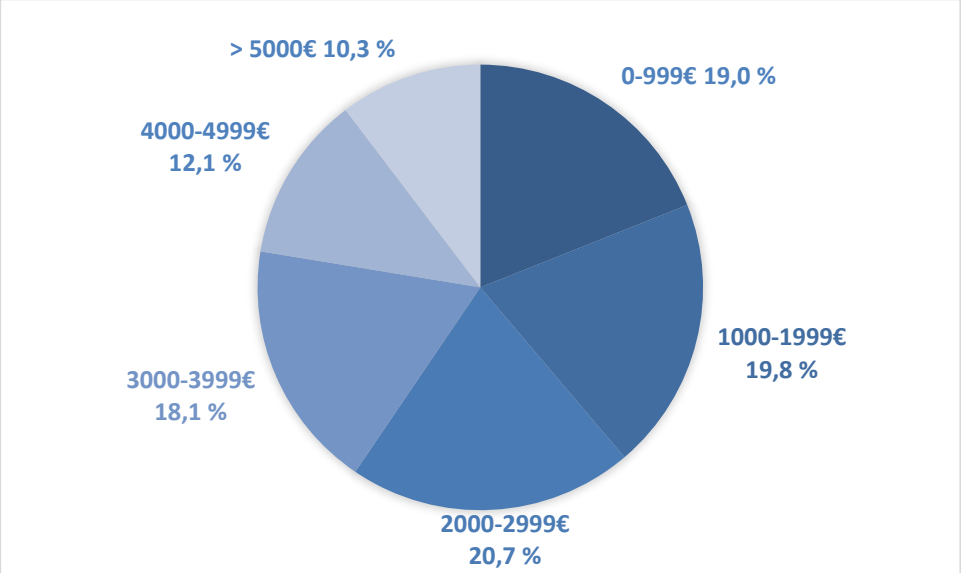

Figure 18. Income breakdown of sample after removing gender bias

Thus, the sample was divided evenly between males and females but some skewedness persisted. However, this weighted sample was only used for triangulation reasons.

THE SURVEY QUESTIONNAIRE

This survey explores the relation between sustainability and the value of a brand. The data will be used for academic research only, and not for commercial purposes. The results from the survey are confidential. This survey will take about 15-20 minutes to complete.

1. Gender (F/M)
2. Age

   15 – 24
   25 – 34
   35 – 44
   45 – 54
   55 – 64
   65+

3. Education

   Primary
   Secondary
   Tertiary

4. Current job
5. Monthly income

   0€ - 999€
   1 000€ - 1 999€
   2 000€ - 2 999€
   3 000€ - 3 999€
   4 000€ - 4 999€
   5 000€+

6. Money spent on sportswear and apparel per year

   0€ - 149€
   150€ - 299€
   300€ - 449€
   450€ - 599€
   600€ - 749€
   750€+

7. I buy sportswear and apparel often (Y/N)
8. I spent a lot of money on sportswear and apparel (Y/N)
9. I bought sportswear and apparel recently (Y/N)

Imagine a brand that sells sportswear and apparel. This brand only sells products that are environmentally friendly. However, at a bit higher price than its competitors. The brand uses a bare minimum of packaging, and products are made from certified organic and Fairtrade material only. The brand collects and recycles its packaging at no extra cost to the customer. The sportswear is coloured with dry colouring techniques that do not waste water

or use hazardous or toxic materials. Furthermore, the sportswear is made from 90% recycled materials. After use, customers can return their products at local retail outlets that sell the brand. These products then are recycled, or in some cases like sneakers, the rubber is melted down and used to build for instance basketball courts. The brand's environmental responsibility is exemplary, and it openly reports its emissions. The brand donates money to help improve the situation of the cotton farmers.

Brand awareness (5 point Likert where 1 totally disagree and 5 totally agree)

BE1 I would like to know more about this brand.

BE2 I have an opinion about this brand.

Brand associations (5 point Likert where 1 totally disagree and 5 totally agree)

BE3 This brand would fit my lifestyle.

BE4 I would be proud to buy products from this brand.

BE5 This brand would fit my personality.

(Following 5 questions are semantic differential scale)

BE6 Distrust ○ ○ ○ ○ ○Trust

BE7 Dislike ○ ○ ○ ○ ○ Like

Perceived quality

BE8 Fragile ○ ○ ○ ○ ○ Durable

BE9 Unreliable ○ ○ ○ ○ ○ Reliable

BE10 Bad quality ○ ○ ○ ○ ○ Good quality

Brand loyalty (5 point Likert where 1 totally disagree and 5 totally agree)

BE11 I would feel loyal towards this brand.

BE12 This brand would be my first choice when buying sportswear and apparel.

BE13 After using this brand of sportswear, I am very likely to grow fond of it.

BE14 For this brand of sportswear and apparel, I have positive personal feelings.

BE15 With time, I will develop a warm feeling toward this brand of sportswear and apparel.

Procurement (5 point Likert where 1 totally disagree and 5 totally agree)

SO1 I would be willing to pay a higher price for a product if it is made without child labour, forced labour, and without discrimination of minorities.

SO2 I would be willing to travel farther to buy a product that has an ecolabel like Fairtrade, Rainforest Alliance or Organic because it is guaranteed to be an environmentally friendly choice.

SO3 If I was an entrepreneur I would not buy products that are made with hazardous or toxic materials, or excessive amounts of water, even if those products would be cheaper.

SO4 A truly sustainable company spends resources on helping their suppliers improve social and environmental conditions even if it means lower profits

SO5 If I was an entrepreneur I would buy my materials from local companies even if it would be cheaper to buy the same materials from abroad.

Logistics (5 point Likert where 1 totally disagree and 5 totally agree)

LO1 I would be willing to wait a little longer for a product to reduce the pollution caused by its delivery.

LO2 I would be willing to pay a little more for a product if it is delivered by using alternative fuels like electricity or liquefied natural gas.

LO3 If I was an entrepreneur I would want the environmental performance of my buildings to be officially tested even if it would lower profit.

LO4 If I was an entrepreneur I would not care about the emissions caused by my buildings because it would cost me money.

LO5 I would analyse all the materials used to build a warehouse to reduce its pollution, even though the same warehouse could be built cheaper and faster otherwise.

Production (5 point Likert where 1 totally disagree and 5 totally agree)

PR1 I think manufacturers should only produce as much good as necessary, and only when they are necessary even if it takes longer to get my products.

PR2 I think a clean and safe factory floor is a requirement for a green product.

PR3 I think companies should always try to improve the quality of their products even if I would need to pay more for them.

PR4 I would buy products made from recycled materials even though they might be of lower quality.

PR5 I would be willing to pay more for products that are made with clean sources of energy like solar or wind energy.

Packaging (5 point Likert where 1 totally disagree and 5 totally agree)

PA1 I think companies should be responsible for all their packaging waste and I would not mind paying a little more for the product.

PA2 I would be willing to pay a little extra for a product that uses packaging made from biodegradable materials.

PA3 If I was an entrepreneur I would not care about excessive packaging because I find it more important my customers notice my products.

PA4 I would be willing to pay a little extra for a product that uses packaging made from recycled materials.

Reverse logistics (5 point Likert where 1 totally disagree and 5 totally agree)

RL1 I don’t want to buy products made from reused parts because their quality might be lower.

RL2 I think products should be recycled after use even if I need to pay a small fee to return them.

RL3 I think products should just be thrown away after use because it is the cheapest and easiest solution.

Marketing (5 point Likert where 1 totally disagree and 5 totally agree)

MA1 If I was a company I would design products especially for customers that care about the environment even if it would be less profitable.

MA2 I think products should be designed so their impact on the environment is reduced even if that increases their price a little.

MA3 If I was an entrepreneur I would openly talk about the environmental impact of my products even when such openness might not be beneficial.

MA4 I am willing to pay extra for green products.

MA5 I think companies should include the cost of their pollution in the final price of a product, even if that means I need to pay extra for those products.

Carbon Management (5 point Likert where 1 totally disagree and 5 totally agree)

CM1 If I was an entrepreneur I would not waste money on measuring the pollution caused by my company.

CM2 If I would be a shareholder I would like to see the company reduce pollution even if I would receive less dividends.

CM3 I think companies should pay a fee for the emission they cause even if that means I need to pay a little more for their products.

Corporate social responsibility (5 point Likert where 1 totally disagree and 5 totally agree)

CS1 If I was an entrepreneur I would not care about following the law in developing countries because no one else does either.

CS2 I find it important that the company I work for has a code of conduct, for instance to prevent corruption, even if they pay a little lower salary.

CS3 If I was a shareholder, I would not want the company to spend money on helping local communities because I would rather receive more dividends.