



Master's degree thesis

LOG950 Logistics

**A sustainable way for apparel retailers' development:
converting the supply chain into closed-loop
Case Study: MiN Boutique's jeans-recycle Scheme**

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Preface

During past 15 years, the fashion apparel environment faced increasingly cut-throat competition, with competitors copying one another and reacting sooner to industrial innovations. Most fashion producers and retailers therefore focused on speed and low cost despite fashion media were propagating about green, innovation, cost-effectiveness, and waste-elimination. Fortunately, accompanying with the increasing awareness of the importance of the environmental performance of products and their manufacturing processes, more and more companies switch their attention to both economic and environmental sustainability.

The owner of our case company, MIN Boutique (a Norwegian fashion apparel retailer with its head office located in Molde), believes that a closed-loop supply chain including recycling is a feasible way to realize the company's target. Having discussed with our supervisor, Hajnalka Vaagen, she indicates that only recycling that can make profit for the whole supply chain would lead to both sustainability for the company.

We believe that economic and environmental sustainability are the ultimate goal for all businesses in the future. Evaluating pricing strategies of the recycled goods to support economic sustainability is therefore an important task, and the core subject of this master's thesis research. Based on these, we choose this topic as our master's thesis. Here we would like to thank our supervisor, Hajnalka Vaagen, for her help, trust and patience. In addition, we also appreciate MIN Boutique for giving us such an opportunity to apply theory into practice.

Content

Preface	5
Content.....	6
List of Figures	8
List of Table	9
Abstract.....	10
1. Introduction	11
2. Literature review.....	13
2.1 Sustainable development.....	13
2.2 Closed-loop supply chain.....	14
2.3 Pricing	16
2.4 Philanthropy	18
3. Brief Methodological Approach.....	20
4. Introduction to the case company	22
4.1 History of MiN Boutique Group AS.....	22
4.2 Target market.....	23
4.3 Prospect of MiN Boutique.....	25
5. The Case Study.....	27
5.1 The Jeans-recycle Scheme	27
5.1 Disposition decision A: Sending to Garbage Station -- Environmental protection...29	
5.1.1 Brief introduction of textile waste in Norway	29
5.1.2 What could the company gain?.....	30
5.2 Disposition Decision B: Sending to Africa -- Philanthropy.....	31
5.3 Disposition Decision C: Remanufacturing in the UK – shoe production.....	38
5.3.1 Environmental impact	38
5.3.2 Pricing strategies to support economic sustainability	38
5.3.2.1 Short-term Pricing.....	39
5.3.2.2 Long-run pricing.....	40
5.3.2.3 Competitors’ reaction.....	45
5.4 Disposition Decision D: Sending to vintage store.....	47
5.5 Economic issues of the Scheme.....	48
6. Conclusions	52

References.....	53
Appendices.....	58
A: Waste in Norway, by material (1995-2009). 1 000 tons.....	58
B: Waste in Norway, by source and material (2008), treatment and material (2008). 1 000 tons.....	59
C: Proof of the break-even equations	60
D: Price list from Jan. 2011, Retura	61
E: Corresponding Q_n to each P_n from 876 to 1100 NOK	62

List of Figures

Figure 1. Varying size apparel retailers' market share in Norway.....	12
Figure 2. Sale amount of MiN BOUTIQU AS, 1969-2007.....	23
Figure 3. Brand positioning in the market.....	24
Figure 4. Future Closed-loop chain of MiN Boutique.....	25
Figure 5. The extended supply chain in the scheme.....	28
Figure 6. A Convergence of Interests.....	32
Figure 7. The Four Elements of Competitive Context.....	33
Figure 8. Maximizing Philanthropy's Value.....	35
Figure 9. Profit maximization.....	41
Figure 10. Procedures of evaluating competitors' capabilities and intentions.....	47

List of Table

Table 1. Pricing objectives in service industry	17
Table 2. Pricing methods in service industry	17
Table 3. The target markets of MiN Boutique's concept stores	23
Table 4. Textile Waste in Norway, 2008, Sorted by Treatment/Disposal	29
Table 5. List of Costs, Disposition Decision A.....	30
Table 6. List of Costs, Disposition Decision B	37
Table 7. List of Costs, Disposition Decision C	39
Table 8. List of Costs, Disposition Decision D.....	48

Abstract

Nowadays, sustainability issues have become the new focuses for contemporary businesses, which are especially important to fashion apparel industry. A huge amount of literature has elaborated benefits the sustainable development brings, the prospect it has and ideas it inspires. In which there is a concept of closed-loop supply chain interests us. This paper mainly focuses on making pricing strategies based on rational pricing models for recycled goods in closed-loop supply chain to realize both economic and environmental sustainability of a Norwegian fashion apparel retailer, MIN Boutique. In addition, some other activities such as garbage treatment and philanthropy with respect to the performance of corporate social responsibility are mentioned.

Key Words: closed-loop supply chain, sustainable development, pricing strategies, corporate social responsibility.

1. Introduction

Demand for textile and apparel in the industrialized countries is increasing after the 1995 Uruguay Round of WTO. The demand is particularly strong among those countries - Canada, EU, Norway, and the United States - whose importers are using Multi-Fiber Arrangement (MFA) quotas (Vollrath, Gehlhar and MacDonald, 2004). In the wake of this, fiercer competition generates. Meanwhile, the increasing demand of textile and apparel also gives rise to the textile waste. For example, according to Statistics Norway's report (2010a), in 2009, 130 000 tons of textile waste was created in Norway. Compared with textile waste in 1995, there is an 18% increase. In addition, fashion media today are propagating about green, innovation, cost-effectiveness and waste-elimination so that more and more sophisticated customers start to focus on clothing made out of recycled materials (GlobalEDGE, 2011). In order to accommodate itself to these changes, apparel industry had better modify its current supply chain and selling strategy.

Nowadays, fierce competitions are everywhere in the apparel industry. Sustainable development, social responsibility and government legislation are three critical factors which influence the apparel enterprises to innovate, promote ability of competition and meet customers' demand (St James Ethic Center, 2010). In order to benefit society, apparel companies' developments should stress on environmental and social issues and sustainable operations. For short products life cycles apparel industry has, recycling of used clothing seems a feasibly sustainable way to gain themselves a profit on economy and further benefit the environment. A concept of closed-loop supply chain would thus be introduced to extend apparel products' life cycle. And further make apparel industry more sustainable.

Usually, bellwether of a specific industry has an unmatched influence in the field it operates, while we think that the largest group in the market may also be that effective. As Figure 1 shown below, middle and small sized apparel retailers in Norway take up the largest market share, which accounts for 32%. We believe as a whole, they have even larger influence than any other standalone companies in the market. Hence successful application of sustainable development strategy in these companies may also spur other companies to adopt a sustainable growth framework. In this thesis, we choose MIN BOUTIQUE GROUP AS, a medium apparel retailer to evaluate the project it implements.

We will research on environmental and social impacts that scheme brings. Moreover, pricing methods to sustain the company's project are concerned.

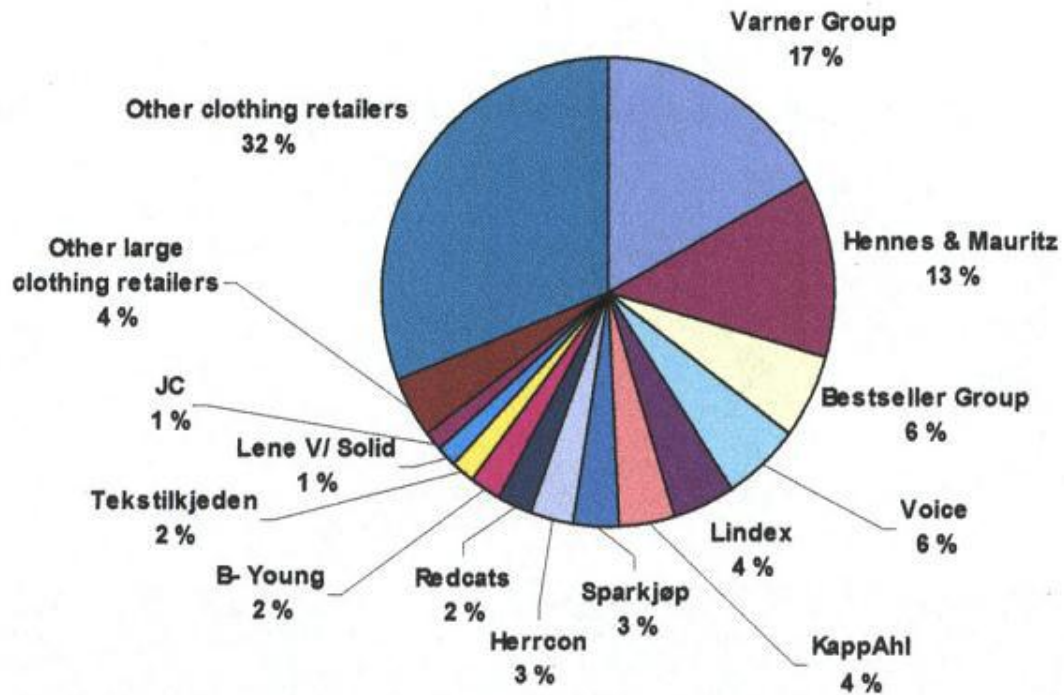


Figure 1. Varying size apparel retailers' market share in Norway (MiN Boutique, 2011)

We organized the remained parts of the thesis as follows:

Section 2 is an overview of the existing literature related to our case. In section 3, a brief methodology introduces the way that we are going to apply into the case. Section 4 is an introduction to the case company, MiN Boutique, while section 5 is the case analysis based on data provided by the case company. Conclusion is in section 6. The appendix contains some relevant data from internet and the standard proof procedure of break-even equation.

2. Literature review

2.1 Sustainable development

As the World Commission on Environment and Development (WCED, 1987) proposed, sustainable development refers not only to meet the contemporary people's demand but could also satisfy the needs of future generations without doing harm to their development. Glodbach, Seuring and Back (2003) suggested that sustainability development should keep the company's operating competitively while let the operations match social and environmental standards. And Andrews (2003 pp.2) also presented that "maintaining ecologically sustainable natural systems, supplying significant social conditions for all people, providing proper living conditions to all people and maintaining a healthy and sustainable economy are four main aspects which sustainable development covers". The framework of sustainable development consists of three elements: economy, environment and society (Brito et al., 2008). And for fashion retail supply chains, these three elements are more critical (Brito et al., 2008).

Focusing on supply chain is a step of sustainable development for companies (Linton, et al., 2007), and greening supply chain is a way to sustainability (Glodbach et al., 2003; Brito et al., 2008; Rao, 2008, pp.xiv; Zhu and Cote, 2004). As Purba H. Rao (2008, pp.xiv) proposed, greening supply chain refers to minimizing the environmental impacts of all activities related to the different phases of the supply chain. He also pointed out that greening supply chain could impact positively and significantly on health and safety, social sustainability. Zhu and Cote (2004) also proposed the similar opinions on greening supply chains. They described that improving economic and environmental performance is the purpose for which greening supply chains are designed. These researches (Glodbach et al., 2003; Brito et al., 2008; Rao, 2008, pp.xiv; Zhu and Cote, 2004) indicated that the areas which sustainable development covers are almost the same areas on what greening supply chain could impact. These findings supported that greening supply chain is a way of sustainable development for a company. Besides focusing on supply chain management, sustainable development must combine such issues: product design, manufacturing by-products, by-products produced during product use, product life extension, product end-of-life, and recovery processes at end-of-life (Linton, et al., 2007).

Because of enormous consumption of resources and emphasized delocalization of manufacturing to developing countries, sustainable development is a key issue in fashion industry (Brito et al., 2008). Some researches related to the fashion apparel industry have been worked out. In Kogg's (2003) case study, she pointed out that good comprehensions of supply chains' actors and the circumstance which companies encounter are advantages for greening textile supply chain. RockBlocks Group (2008), a leader in global sourcing and supply chain solution for apparel retailers, has announced a 6-step method for greening retailers' supply chain. These six steps are: (1).*Evaluating environmental impacts*; (2).*Setting up metrics for measurement*; (3).*Options determination*; (4).*Corporate social responsibility initiatives*; (5).*Global environmental review*; (6).*Building a sustainable brand*. And some factors, such as waste generated from supply chain, energy utilization rate, greenhouse gas emissions and environmental legislation should be thought over when designing a green supply chain (Paksoy et al., 2011). With regard to customer behavior, Cervellon et al. (2010) have surveyed the people from different countries, and found that the people, especially the youth, from Europe would pay more attention to sustainability in fashion industry than the people from North America do.

2.2 Closed-loop supply chain

Closed-loop supply chain, just as Mark E. Ferguson and Gilvan C. Souza (2010) defined, refers to the supply chains in which there are backward flows of materials, from end customers to manufacturers. Paksoy, Bektas and Ozceylan (2011) also proposed that a closed-loop supply chain is the supply chain which combines a series of forward and backward activities. Closed-loop supply chains normally include activities of product acquisition, reverse logistics, testing and grading, making disposition decisions, reconditioning, distributing and selling of the recovered products (Klose et al., 2002, pp.56; Guide, et al., 2003). Guide and Wassenhove (2009) proposed business definition of closed-loop supply chain management as "*the design, control, and operation of a system to maximize value creation over the entire life cycle of a product with dynamic recovery of value from different types and volumes of returns over time*". They also summarized five phases of evolution of closed-loop supply chain: "the golden age of remanufacturing", "from remanufacturing to valuing the reverse-logistics process", "coordinating the reverse supply chain", "closing the loop", "prices and markets". And they also stated that the

importance of closed-loop supply chain is gradually unveiled in diverse industries, however, academic research of industry practice in such area is scarce.

Products return from end customer play a crucial role in closed-loop supply chain (Morana and Seuring, 2007). Generally speaking, there are three typical types of product acquisition in the closed-loop chain: consumer returns, end-of-use returns, end-of-life returns (Ferguson and Souza, 2010). Identification of the form of products return is absolutely necessary in closed-loop chain (Rao, 2008, pp.119). Based on Morana and Seuring's (2007) research, most customers are willing to return products at the end of the products' life cycle. There are two basic factors should be concerned in product acquisition section: one is the uncertainty related to the recovery process in terms of quality, quantity and packaging, and another one is the way of collecting such products and the way of transporting collected products (Linton, et al., 2007).

According to the cases analyses in Rao's (2008, pp.120-128) book, products acquisition from end-customers in closed-loop supply chain are totally different in varied industries. For instance, return rate of high-fashion garment could be 15% higher than that of high-tech product (Dekker, et al., 2004). Moreover, proper product design is an essential in closed-loop supply chain in all industries. Product design which facilitates backward logistics always has positive impact on product recycling (Rao, 2008, pp.126). And in terms of closed-loop supply chain management, the design which promotes the process of reuse, recycling and recovery is crucial (Zhu, Sarkis and Lai, 2008).

There are several disposition decisions for recycled products: landfilling, incineration, recycling, parts harvesting, resale, internal reuse, remanufacturing or refurbishing (Ferguson and Souza, 2010). Rao (2008, pp.119) also stated several ways of dealing with the collected items: selling as new, donate to charity, disassemble and recover useful parts, remanufacture or refurbish completely, etc. In such disposition decisions listed above, remanufacturing is a potential decision for higher profitability (Ferguson and Souza, 2010). Because remanufacturing could expand the products' useful life and decline energy and material consumption, it is a value-added operation on economic and environmental aspects (Ferguson and Souza, 2010).

Market which closed-loop chain highly concentrates on has two segments: one is return of used products, and another one is sale of remanufactured products (Rao, 2008, pp.119). Market of remanufactured products can be allocated in two categories: perfect substitution which is complete cannibalization market and secondary markets which have no cannibalization. Market cannibalization deters remanufactured products from re-entering the market (Guide and Wassenhove, 2009). In the remanufactured products market, most economic values are generated by retailer while very little of them are created by manufacturer (Guide and Wassenhove, 2009).

In apparel industry, recycled clothing can be treated as raw material (Young et al., 2004). And remanufactured product from closed-loop chain can be treated as a kind of eco-clothing (Cervellon et al., 2010). Cervellon (et al., 2010) has launched a survey of people's responses on eco-clothing. According to their report, environment, health and ethics are three most significant criteria for customers when they are purchasing organic garments. But there is an ironical phenomenon also stated in the report. Customers reckon environmental protection as a significant essential when they are going to choose garments; however, most of them do not treat this seriously when purchasing clothes in fashion stores (Cervellon et al., 2010). In addition, reputation of seller is a criterion which is more critical for customer to buy a remanufactured item than to purchase a new one (Subramanian, 2010).

2.3 Pricing

Basically, the most important principle of pricing is to align pricing objectives with the operational objectives and marketing objectives of the company (Roth, 2007). Avlonitis and Indounas (2005) concluded a series of pricing objectives in services industry (shown in Table 1.), and classified staple pricing methods for services companies into three categories: cost based, competition based and demand based (shown in Table 2). Due to simplicity of implementation, the most extensive-use pricing methods for services companies are cost plus and pricing according to the market's mean prices (Avlonitis and Indounas, 2005).

Profit maximization	Achievement of satisfactory profits
Sales maximization	Achievement of satisfactory sales
Market share maximization	Achievement of a satisfactory market share
Market share increase	Cost coverage
Return on investment (ROI)	Return on assets (ROA)
Coverage of the existing capacity	Liquidity maintenance and achievement
Price differentiation	Service quality leadership
Distributors' needs satisfaction	Creation of prestige image for the company
Price stability in the market	Price wars avoidance
Sales stability in the market	Market development
Discouragement of new competitors' entering into the market	Price similarity with competitors
Maintenance of the existing customers	Customers' needs satisfaction
Determination of "fair" prices for customers	Attraction of new customers
Long-term survival	Achievement of social goals

Table 1. Pricing objectives in service industry (Avlonitis and Indounas, 2005)

Category	Method
Cost based	Cost-plus method
	Target return pricing
	Breakeven analysis
	Contribution analysis
	Marginal pricing
Competition Based	Pricing similar to competitors
	Pricing above competitors
	Pricing below competitors
	Pricing according to the dominant price in the market
Demand- Based	Perceived-value pricing
	Value pricing
	Pricing according to the customers' needs

Table 2. Pricing methods in service industry (Concluded from Avlonitis and Indounas, 2005)

To find out an appropriate pricing strategy for the remanufactured product is a crucial challenge in closed-loop supply chain (Guide and Wassenhove, 2009). With the premise that there is no difference in quality, pressure for pricing a remanufactured product is less than pricing a new product as remanufacturing cost normally accounts for 40%-60% of that of a new one only (Mitra, 2007). However, how to set a fair price for attracting potential customers to buy the remanufactured products still remains as a difficulty that needs to be resolved (Subramanian, 2010). In Ferguson and Souza's book, they also made some advices of remanufactured products' pricing strategy. They pointed out that some simple pricing strategies could be applied on remanufactured products, such as cost plus, or a certain percent below the price of new.

Customer preference and competitors' reactions also need to be taken into consideration. Otherwise, an inappropriate pricing strategy may lead to the company's failure (Mao and Ostaszewski, 2007). According to the definition of game theory, pricing is a game (Mao and Ostaszewski, 2007). As Mao and Ostaszewski (2007) defined,

Game theory is an area of applied mathematics that studies strategic interactions among game participants, where players choose different actions in an attempt to maximize their returns.

It is the study of how interdependent decision makers make choices, and a game must consist of players, actions, information, strategies, payoffs, outcomes and equilibrium (Waldman and Jensen, 2007, pp.207). Traditionally, implementations of game theory attempt to locate equilibrium in the game. Many equilibrium concepts have been developed such as Nash equilibrium in order to find out the decisions. Waldman and Jensen also mentioned that game theory has been frequently used by economists to analyze a wide variety of economic interactions in the last two decades.

2.4 Philanthropy

During past several decades, a great amount of knowledge on philanthropy has proliferated. Carroll (1999) has sorted out an evolution history (1950s – 1990s) of Corporate Social Responsibility (CSR) and proposed a revised statement of CSR in 1991. This time, he incorporated philanthropic component with economic, legal and ethical components into the CSR definition and recognized the significance it has. Although accepted charitable giving as an exceptional instance of help behavior because the recipients of it normally are

not located in the context where donations are made, Bekkers and Wiepking (2010) defined philanthropy as the donation of money to a non-profit organization which would finally benefit grantees. Some companies provide goods, services or assist to the charity as an alternative of monetary donations (Campbell et al., 1999).

In 1970, Milton Friedman argued that “corporate philanthropy is an unjust tax on stockholders” to answer to increasing calls for better performance of CSR. However, many companies examined their overall profit after philanthropy has applied and the outcome let them believe that “firms can actually do better by doing good” (Campbell et al. 1999). Porter and Kramer (1999, 2002) have systematically elaborated the approaches and the goals to do corporate philanthropy. Benefits of philanthropic giving were then mentioned in several articles (Porter, 2006; Gardberg and Fombrun, 2006; Chen et al., 2008).

3. Brief Methodological Approach

Our thesis is based on a specific jeans-recycle scheme that a Norwegian fashion apparel retailer, MiN Boutique Group AS, works on. What the company expects is to determine the scheme's sustainability. To approach the company's aim, we will analyze the scheme's sustainability in terms of environment, society and economy.

As for environment, we will first analyze the Norway-based statistical data to find out current situation of discarded textile. Then we are going to assess the possible environmental impacts brought by running this project and the cost that the company needs to pay.

With regard to economic impacts, our main task is to evaluate pricing strategies and to come up with appropriate pricing models that would help the case company set a fair price for the recycled shoes to sustain this scheme. Several pricing methods will be presented in the relevant parts of our thesis. Because new pricing strategies interact with customer demand, we need to identify the changes in demand which companies' need to cope with. Some concepts and methods will be introduced to measure the demand changes, such as Price Elasticity of Demand (PED), breakeven sales analysis.

When it comes to social issues, we are talking about the philanthropy given in the project, a branch of Corporate Social Responsibility (CSR). We will introduce the type of philanthropy that can benefit both the company itself and the society. After that, how a company could give meaningful and successful philanthropy will be discussed based on relevant literature. At last, effects of charitable giving will be evaluated practically and theoretically.

Since our thesis is based on real company's specific case, primary data such as expected sales volume, purchasing price of recycled shoes etc. are provided by the case company weighs heavily in our research. In order to fully understand the case company's ideas, we had several meetings with the company's contact person, Ms. Stenseth. She provided us with full range and depth of information we need in the research.

The secondary data which is used for establishing an appropriate theoretical framework in this thesis should be collected as well. We need to search relevant data relating to apparel industry, environment, pricing model, and philanthropy etc. And most of the data sources are from internet, such as online scientific databases in our college library, Norwegian Statistics and Google.

4. Introduction to the case company

4.1 History of MiN Boutique Group AS

MiN Boutique Group AS (MiN Boutique) is a Norwegian fashion and sports apparel retailer established in 1969. In 1988, it opened the second store, a Vero Moda concept store, in Norway. In 1990, MiN Boutique cooperated with Bestseller AS (Denmark) and started another three Vero Moda stores in Tønsberg, Kristiansund and Molde, respectively. The agreement with Bestseller ceased in 1st March 2007 and Miles Ahead (MAH) continued operating based on the x-Vero Moda premises.

In the period 1979-2002, MiN Boutique was a member of the procurement chain Samtex (now it is called “the Match”). Through the membership for 22 years, the company’s management has considerable expertise and experience in chain operations. MiN Boutique went out of the chain in 2002 when the Match was sold to the Voice, and MiN Boutique remained a standalone multi-brand shop. MiN Boutique expanded in 2002 to Oslo through the acquisition of two stores, Paleet and Glass Magasinet.

Since 1999 MiN Boutique has expanded its business to Møre and Romsdal, with additional stores in Kristiansund, Ålesund, Sunndal, Elnesvågen and Åndalsnes. Centralization of Oslo and Tønsberg has also been successful.

MiN Boutique strengthened its management. Until July 2007, it has been a business manager of seven Bertoni shops in Norway. These are sold back to the franchise owner Bertoni Denmark. Now, Molde Fashion Forum, B-Young Molde, is also under the administration of MiN Boutique.

Separate stand-alone concept, the company operated from 1969. MiN Boutique has spent 20 years in learning and 10 years in full-load operating. 2007 - 2010 is a period of consolidation and great changes for the company. Cooperation with Vero Moda and Bestseller Group has ceased and then started cooperation with B-Young. And all Vero Moda stores were closed, sold and/or changed the profile. The shops in Oslo, Tønsberg and Kristiansund are no longer in the portfolio. A top-heavy organization slimmed down. During 2006 and 2007, two concept stores have been set up, Mia Bao and Miles Ahead

(MAH). And during this period, MiN B Boutique’s development could also match the market. Figure 2 shows the company’s turnover from 1969 to 2007. In the first two decades, the sale amount was growing slowly. The turnover was booming in the third decade of the company’s development. In 2007, the turnover was over 1 200 000 NOK.

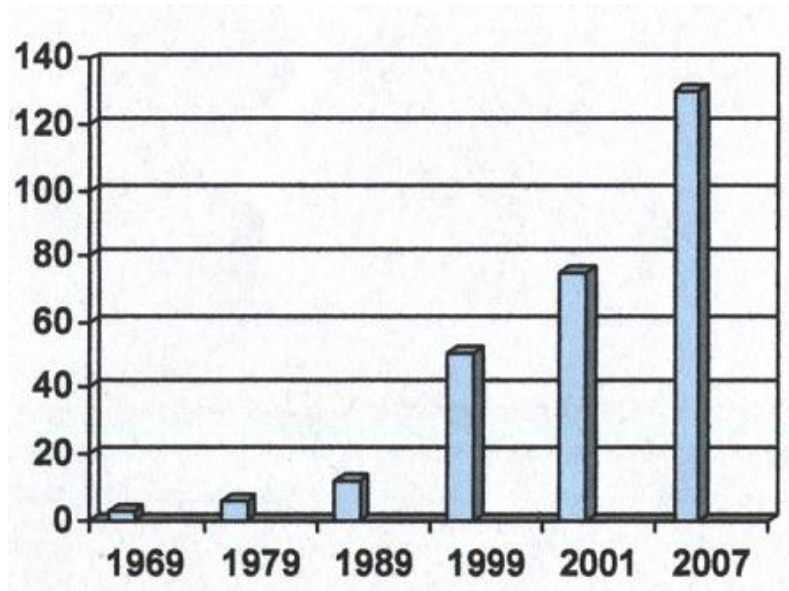


Figure 2. Sale amount of MiN BOUTIQUE AS, 1969-2007

4.2 Target market

Today, MiN Boutique operates three concept stores which are oriented to female customers and another kids-fashion store. Table 3 indicates the different target customers of three concept stores: MiN BOUTIQUE*, Mia Bao and Miles Ahead (MAH).

	Age	Purchasing Power	Preference
MiN BOUTIQUE ¹	30-60	High	Fashion
Mia Bao	25-35	Medium – High	Fashion and function oriented
Miles Ahead	15-25	Low - Medium	Interested in good prices and high-fashion

Table 3. The target markets of MiN Boutique’s concept stores

MiN Boutique will target female consumers with good purchasing power, typically aged between 30 and 60. Mia Bao, another concept store in Molde, fashion and function oriented females are its main consumers. They are aged 25-35, including some new mothers and professional women. The target customers of these two stores have similar

¹ One of MiN Boutique Group AS’ concept store also named “MiN Boutique”, for distinction, MiN BOUTIQUE with capital “BOUTIQUE” denotes the concept store

characteristic with medium/high-end incomes. Based on such an economic foundation, they do not take too much price factor into consideration when they are choosing garment.

Young trendy women, aged 15 – 25, are main consumers for MAH. They are prices and high-fashion focused. These consumers are sorted in low-medium price segment. In comparison with the target customers of MiN BOUTIQUE and Mia Bao, the customers at whom MAH aims do not have paralleled purchasing power. Low-price & High Fashion strategy will match them well.

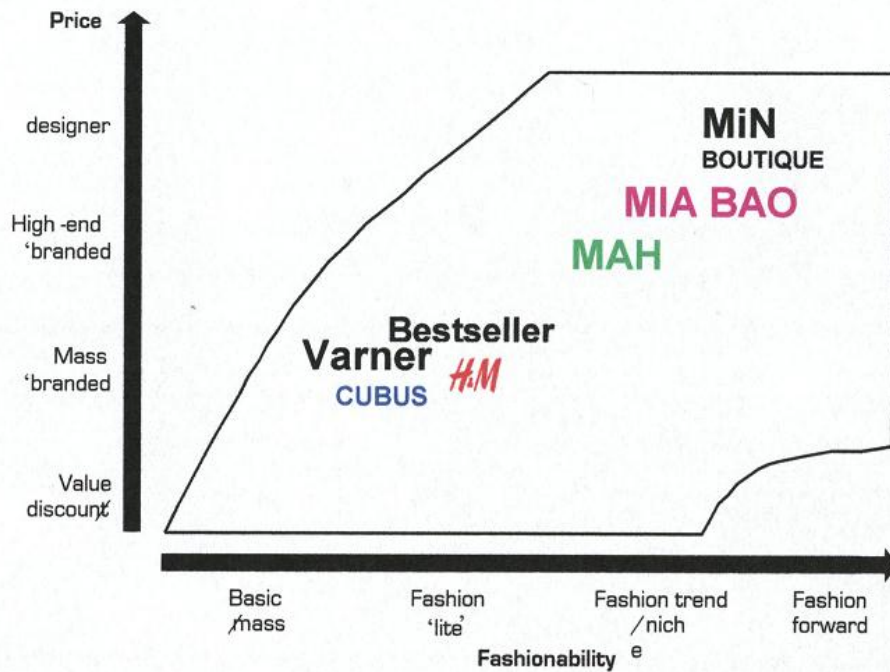


Figure 3. Brand positioning in the market

Figure 3 demonstrates different brand position of the company's three concept stores. In the figure, vertical axis of the coordinate denotes the pricing level of the brand, the higher the more expensive. The horizontal axis denotes the fashion level. The company's three concept stores, MAH, Mia Bao and MiN BOUTIQUE are in the upper right of the coordinate. Comparing with the company's competitors, such as H&M, CUBUS, the concept stores of the company focus on the middle and high end markets which have lower price sensitivity and high fashion oriented.

4.3 Prospect of MiN Boutique

Archie B. Carroll (1999) concluded that “the Corporate Social Responsibility (CSR) would remain as an essential part of business practice” since the public requires the business community today to be social responsible. In other words, the performance of CSR becomes a new measurement to evaluate the business. Through the discussion with Inger Mette Stenseth, the owner of MIN Boutique, we find that she is a philanthropic, ambitious and provident leader with well understanding of public concerns. She would like to contribute towards philanthropy and environmental protection as long as such a business is economic sustainable.

She has noticed that the amount of discarded jeans in Norway is enormous and neither other retailers nor customers have realized the value of those jeans. However, she believes that there is a potential market hidden behind where customers can sell their unwanted jeans back to retailers and retailers can recycle them. Apparently, this would cut down the pollution derived from disposing of jeans and make money for both customers and retailers.

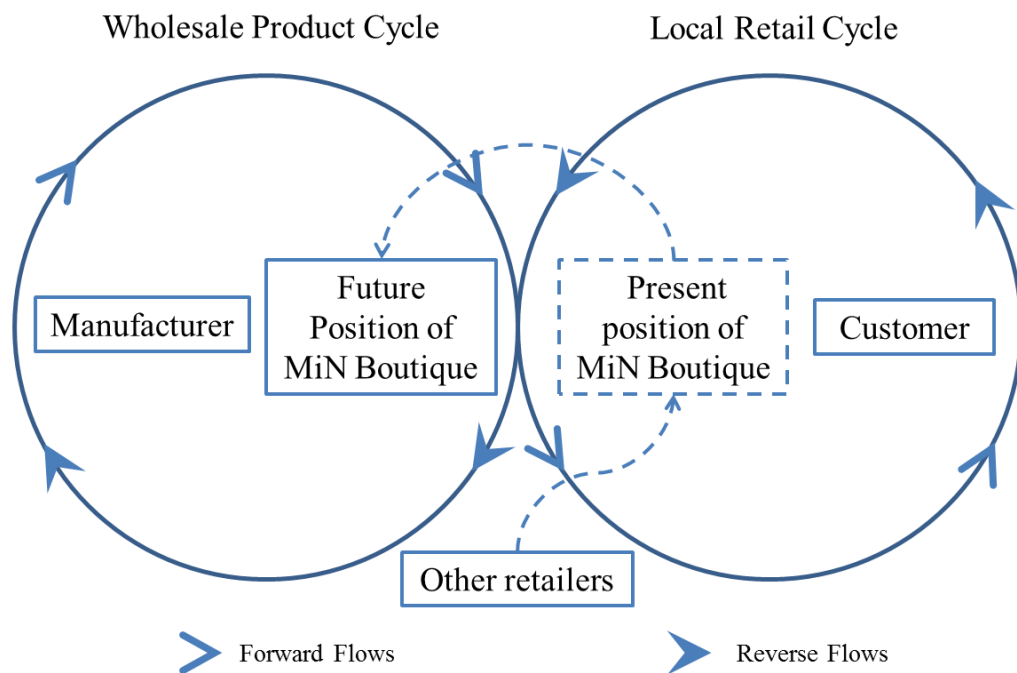


Figure 4. Future Closed-loop chain of MiN Boutique

MIN Boutique is willing to be a pioneer to join the potential market to test the feasibility of such a jeans-recycle project. Figure 4 shows the company’s anticipation of future. Present position of MiN Boutique in the scheme is locating in local retail cycle. Once Min

Boutique finds that a robust closed-loop chain has been formed, the concept will be introduced to other retailers. At that time, Min Boutique will shift its position from local retail cycle to wholesale product cycle, and other retailers will enter the market to take the place of MiN Boutique in local retail cycle. Meanwhile, MiN Boutique will play as an agency connecting manufacturer with other retailers and will further expand its business to all over Norway.

5. The Case Study

In this part, we are going to analyze sustainability of each disposition decision in the case. Generally, we will concentrate in three main aspects of the sustainability: environmental sustainability, economic sustainability and social sustainability.

5.1 The Jeans-recycle Scheme

Now, MiN Boutique has its first move, to carry out a jeans-recycle scheme. According to the information provided by the company, the scheme can be described as the following 3 steps.

The first step is to collect jeans from customers. Customers of MiN Boutique can take their wore jeans which are outmoded or damaged to any MiN Boutique branch store to get a price-off coupon. One coupon can be used on a 300NOK purchase or ten coupons can be used as a whole to buy anything in the stores. From existing cases, compared with the traditional utilization of coupon, the customers taking part in such a scheme are more inclined to bring the coupon back to stores (Cooper, 2009).

The second step, here sorting operation will be carried out. The company will sort out those jeans according to the quality and style and brand. This phase is the pre-condition of the third step of the scheme.

The third step is to send the sorted jeans to appropriate destinations. Four places are there. The highly damaged jeans will be sent to the garbage station. Some classic jeans with no functional problem will be sent to African countries for charitable causes. Some of the rest will be sent to the factory in the UK to re-manufacture into eco-sandals. The jeans with special value, for instance, worn or signed by celebrities will be sent to vintage stores in Oslo for resale.

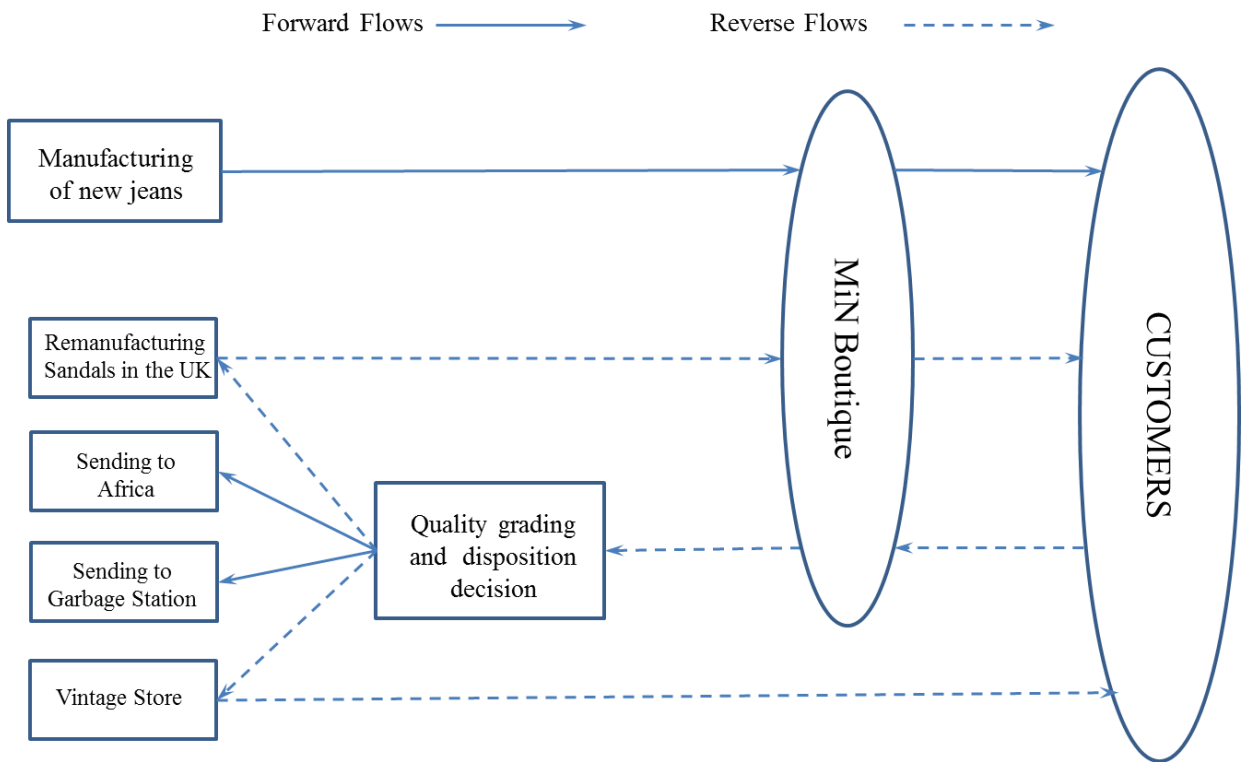


Figure 5. The extended supply chain in the scheme

Figure 5 demonstrates the extended supply chain of the company in the scheme. The supply chain consists of two parts. The first part is a normal supply chain, selling new products to customers, in which only forward goods flow exists. And the second part of the new supply chain has two closed-loop supply chains. One is that MiN Boutique collects jeans from customers, sends them to the UK to remake into sandals and then resells those sandals to customers. Another is to send the collected jeans to vintage store to resell to customers. Both forward and reverse flows are there in these two chains, which would benefit not only the customer as well as the company but also the environment.

In the following parts, the notations and data shown below would be used:

Q_j = total amount of the collected jeans;

Q_s = expected sales volume of the remanufactured sandals, $0 < Q_s \leq Q_j \times P_3$;

P_1 = percentage of the collected jeans that are treated as garbage;

P_2 = percentage of the collected jeans that are sent to Africa for philanthropy;

P_3 = percentage of the collected jeans that are sent to the UK as raw material of recycled shoes;

P_4 = percentage of the collected jeans that are sent to vintage store in Oslo for sale;

$P_1 + P_2 + P_3 + P_4 = 100\%$;

C_c = price of the coupon used in jean's collection stage, in NOK/unit;

C_g = Unit disposal cost of the collected jeans that are treated as garbage, in NOK/unit;

C_r = unit cost of remanufactured sandal, in NOK/pair;

P_s = price of selling remanufactured sandal to customers.

The specific figure of these notations will be introduced in section 5.5.

5.1 Disposition decision A: Sending to Garbage Station -- Environmental protection

5.1.1 Brief introduction of textile waste in Norway

The total amount of textile waste in Norway reached 130 000 tons in 2009 (Statistics Norway, 2010a) which is at the same level in 2008. Table shown below indicates that, 40% of the textile waste in Norway has been sent to landfill in 2008. Second large part of them, 33.85%, has been sent to generating plants or heat-engine plants for energy recovery. Only 9.23% has been sorted for material recovery. Generally speaking, less than 50% of the waste is sent to recover in 2008. The capacity of textile recovery still has large room to improve.

Treatment / Disposal	Amount(*1000 tons)	Percentage (%)
Sorted for material recovery	12	9.23
Biological treatment	0	0.00
Energy recovery	44	33.85
Filling compound and cover material	0	0.00
Incineration without energy recovery	13	10.00
Landfill	52	40.00
Other final treatment	0	0.00
Other or unspecified	7	5.38
Total	130	

Table 4. Textile Waste in Norway, 2008, Sorted by Treatment/Disposal (Adapted from Statistics Norway, 2010a)

Recovery of garbage is a general meaning of waste reuse. The definition can be expressed in two aspects, material recovery and energy recovery. Material recovery is the utilization of waste which material is both partly and entirely kept. Energy recoveries are incineration with energy utilization and composting (Statistics Norway, 2010b). From environmental aspect, material recovery is more environmentally friendly than energy recovery. Incineration always emits greenhouse gas, such as CO₂, N₂O and CH₄ etc. which will heighten the temperature and harm the environment eventually. In addition, residues from incineration are landfilled again in Norway (Statistics Norway, 2010c), however, landfills or incinerators is not sustainable (Ferguson and Souza, 2010).

5.1.2 What could the company gain?

In terms of economic aspect, sending sorted jeans to garbage station gives negative impact on the company. The company could not benefit in terms of monetary value by taking such proposition decision. Nevertheless, with regard to environmental consideration, positive impact will arise.

In 2008, two fifths of textile waste, 52 000 tons, were generated from households (Statistics Norway, 2010a), only 13 000 tons (Statistics Norway, 2010d) of them have been used to recovery. On the one hand the company's jeans collection scheme could increase the recovery rate of households' textile waste. Utilization of the end-of-life jeans will be improved, both from material recovery and energy recovery. On the other hand, because most of collected jeans will be sent to material recovery in the scheme, the way jeans treated in the scheme could be more environmentally friendly than treating them by householders themselves. MiN Boutique is providing a 50 NOK coupon in exchange for a pair of jeans; hence, people can get economic benefits from returning jeans to the company. This will stimulate local residents to send back their unused jeans to recycle.

(Unit: NOK)

Costs of collected jeans used in disposition decision A	$Q_j \cdot P_1 \cdot C_c$
Total Cost of disposal of garbage	$Q_j \cdot P_1 \cdot C_g$
Total Costs of disposition decision A	$Q_j \cdot P_1 \cdot (C_c + C_g)$

Table 5. List of Costs, Disposition Decision A

Table 5. is the list of cost in disposition decision A. According to the price list provided by Retura (a waste services company in Møre and Romsdal), Retura charges 1840 NOK for business organizations to dispose one ton of textile waste. And as MiN Boutique estimated, 125 pieces of jeans weight 100 kilograms. Then we can calculate unit disposal cost of the collected jeans,

$$C_g = \frac{184}{125} = 1.472 \text{ NOK}$$

5.2 Disposition Decision B: Sending to Africa -- Philanthropy

Since 1990s, accompanying with economic globalization, the performance of Corporate Social Responsibility (CSR) has become a significant measurement of a certain company's reputation. Archie B. Carroll (1999) further elaborated his previous definition of CSR written in 1979, saying "In my view, CSR involves the conduct of a business so that it is economically profitable, law abiding, ethical and socially supportive." From his point, CSR has four components: economic, legal, ethical and philanthropic. In this paper, we will however only talk about the charitable responsibility.

In 1970, reacting to the increasing calls of greater social responsibility of business, the economist Milton Friedman argued in an article published in New York Times Magazine that the only CSR was to increase corporate profits. Actions like philanthropy which would cut off profits were unfair to stockholders. Although his argument is proved to be right by the profits-focused companies in most of the time, Michael E. Porter and Mark R. Kramer, in 2002, figured out that Friedman's argument was based on two implicit assumptions:

1. *Social and economic objectives are separate and distinct so that a corporation's social spending comes at the expense of its economic results.*
2. *The assumption that corporations, when they address social objectives, provide no greater benefit than is provided by individual donors.*

Hence, they came up with a more reasonable way to think about corporation philanthropy. They stated that doing philanthropy does increase the corporation's expenditure and thus lowers its profits in the short run. However, it will improve a corporation's competitive context and align its social goal with its economic goal in the long run. Moreover, the

corporation can not only give money but also use other methods to help do charitable causes, and it provides greater social benefit than individual donors providing. This statement contradicted Friedman's two assumptions and was proved by a few companies. Cisco Systems is a typical example.

“In the long run, social and economic goals are not inherently conflicting but integrally connected,” saying Michael E. Porter and Mark R. Kramer (2002). They believed that the competitiveness depends heavily on the certain company's productivity, which is restricted by the company itself as well as its business environment. Therefore, we note that only the philanthropy that will bring the company combined social and economic benefit would increase the company's productivity and further enhance its competitiveness.

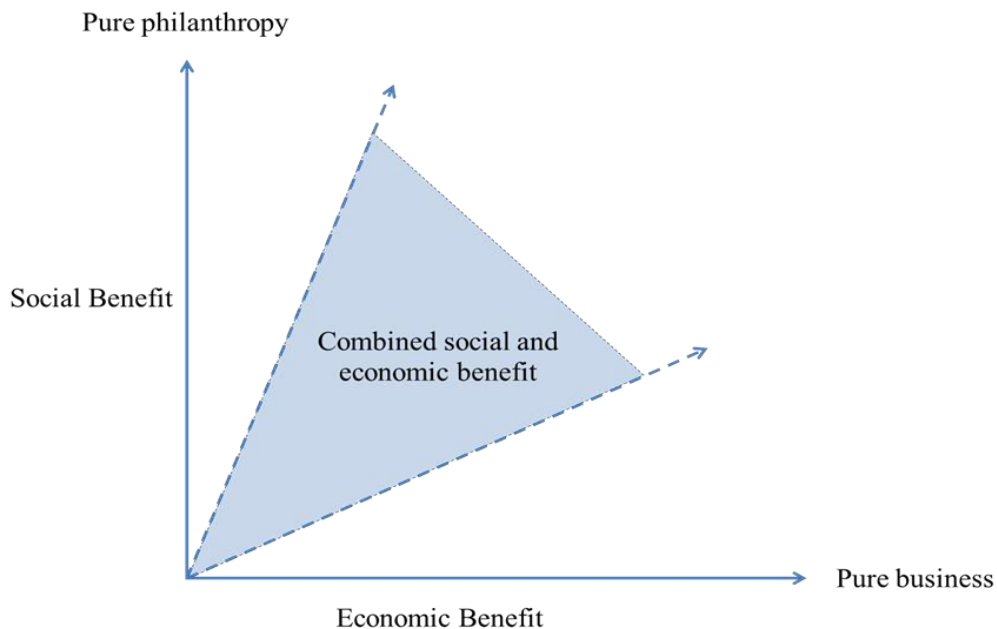


Figure 6. A Convergence of Interests (Porter and Kramer, 2002)

The shaded area in the above exhibit is where philanthropy makes sense and stockholders are interested in.

As mentioned before, corporation philanthropy will improve the corporation's competitive context in the long run. Competitive context is the quality of the business environment where the company locates and/or operates. (Porter and Kramer, 2002) The characteristics of the competitive context are considered as determinants that can somehow influence the

company's strategy and profitability. (Depperu and Gnan, 2003) Thus, the importance of competitive context is obvious.

As shown in the figure 7, a certain company's competitive context has four interrelated parts (Porter and Kramer, 2002):

- Context for Strategy and Rivalry: presence of local regulations and competition.
- Factor Conditions: availability of required inputs such as human resource, natural resource and related infrastructure.
- Related and Supporting Industries: presence of cluster of capable and locally based suppliers.
- Demand Conditions: presence of normal customer needs, local customers with particular demand and local demand in specialized segments.

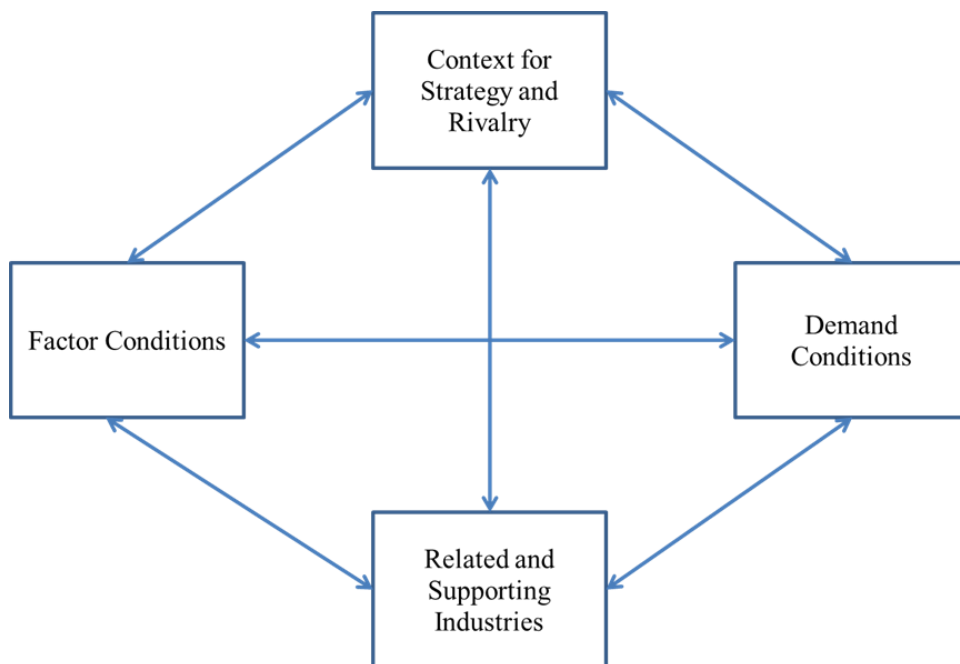


Figure 7. The Four Elements of Competitive Context (Porter and Kramer, 2002)

These four parts always influence a company's competitiveness in each field simultaneously and coequally. Thus the competitiveness of the company will be weakened in case that the context has weakness in any part. Based on the feature of each part, Porter and Kramer analyzed how companies can influence the context and realize their long-term economic objectives through philanthropy:

- Context for Strategy and Rivalry

The local policies that help build a fair, reliable and robust market for competition have positive influence on productivity. “Philanthropy can have a strong influence on creating a more productive and transparent environment for competition,” said Porter and Kramer, 2002. They used the Transparency International case in which 64 corporations from all over the world had joined together to focus public attention on disclosing and deterring corruption to create an environment for higher productivity and fair competition

- Factor Conditions

The presence of human resource, adequate related infrastructure, available natural resources and transparent and efficient administrative procedure can all be affected by doing charitable giving (Porter and Kramer, 2002). For example, a company can create a special and free program to train low-income local residents and/or poor students in cooperation with local government. And normally people who benefit from this training would give priority to this company when they are in job hunting. Also, SC Johnson launched a so-called Sustainable Racine project to better serve its home city, resulting in water saving and pollution reducing. ExxonMobil, the world's largest publicly traded international oil and gas company, has spent a lot of resources in improving roads conditions in the places where it operates.

- Related and Supporting Industries

A company’s productivity highly depends on its related and supporting industries to which it outsources. And usually, the company would like to choose its partners nearby rather than distant. This is because proximity not only enhances the convenience but also lowers the transportation cost and inventory cost. Philanthropy can improve the quality as well as the quantity of associated industries. For instance, a travel agency’s business depends on attractions such as hotels, restaurants where it operates. In order to strengthen them, the travel agency can start a gratis training course in high schools and colleges. After students who have studied in this course graduate, some of them will take jobs in the travel-related industry. American Express is a successful pioneer of doing this.

- Demand Conditions

Philanthropy can impact on demand conditions in a region which include the size of the customer needs, the standards of products and the sophistication of the customer there. Apple Computer, for instance, has donated its computers to schools. This brings

obvious social benefits to the schools while students and staff are gradually turned into sophisticated potential customers of Apple Computer.

Finally, Porter and Kramer had concluded that “philanthropy can often be the most cost-effective way - and sometimes the only way - to improve competitive context.”

After charitable causes have been successfully implemented, other companies, even competitors will benefit from the improved competitive context. At this time, how to create the greatest social and economic value to gain an advantage in the competition is the problem we are facing.

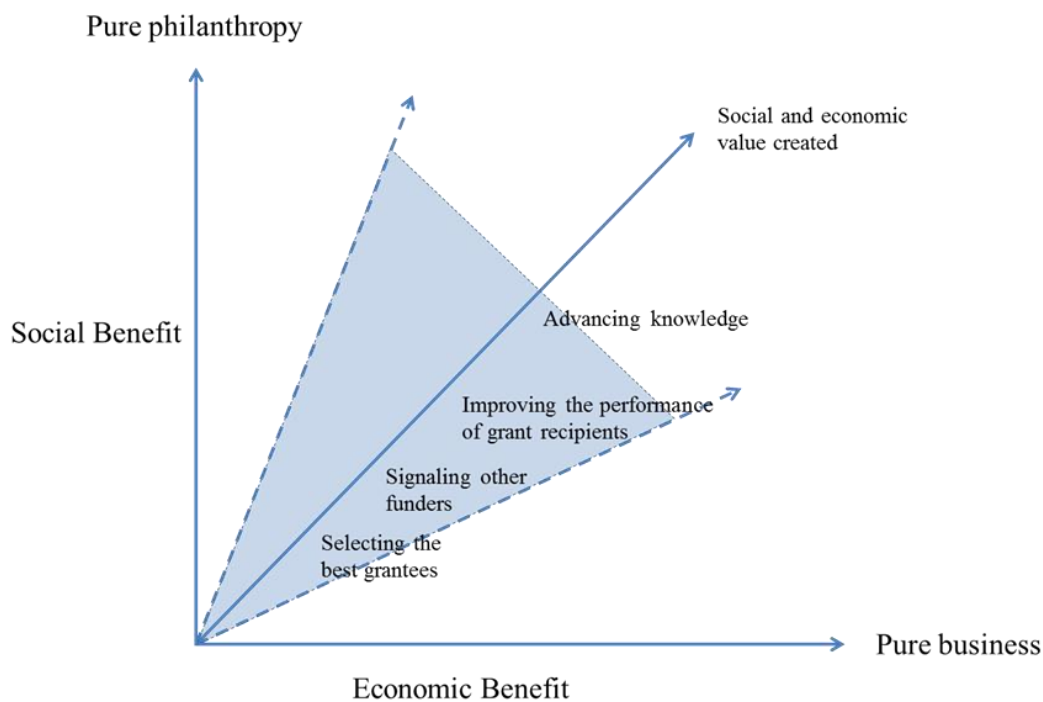


Figure 8. Maximizing Philanthropy’s Value (Michael E. Porter and Mark R. Kramer, 2002)

As illustrated in exhibit above, Porter and Kramer outlined four stages describing how philanthropy creates social value:

1. Selecting the best grantees

Foundations have experienced expertise to choose grantees that are the most cost-effective and/or that are in urgent need to deal with serious problems to channel resources to. Hence, each dollar provided by specialized foundations will earn a higher social value than the dollar given by non-professional donors.

2. Signaling other funders

This is an extension of the first step. If a foundation is good at selecting procedure, it can magnify the created value by attracting other funders by offering additional education or suitable grant.

3. Improve the performance of grant recipients

Foundations can offer specialized assets to help grantees improve their capabilities and improve their performance and thus increase the return on their total budget.

4. Advancing knowledge and practice

“The most powerful way to create social value is by developing new means to address social problems and putting them into widespread practice,” said Porter and Kramer in 2002.

The former stage is the foundation of latter stage. They also argued that these four principles are the guarantee that corporate philanthropy has larger impact than individual donations. But later, they realized that four forms of value creation are not that complete. They proposed a new five-step approach where the CEO and the entire management team of the company should participate in:

1. Examine competitive context of all the company’s locations to find out the key constraint which limits its competitiveness and growth.
2. Shift the company’s philanthropy from communal obligation performing and goodwill building to strategic giving, i.e. focusing on improving competitive context.
3. “Assess existing and potential corporate giving initiatives against the four forms of value creation.”
4. Seek partners to cooperate with.
5. Monitor and evaluate the achievements.

Inger Mette Stenseth, the owner of our case company, MiN Boutique Group AS, has a new plan this year. She wants to do a jean’s collection and send part of collected jeans to Africa for philanthropy. Since she thinks now it is the good time to expand her company’s business to Africa and doing charitable causes is a good way to explore African market and establishing good reputation as well as relationships there.

Having understood the social and economic value creating procedure, MiN Boutique chooses a professional and experienced social-aid agency, Norad. Norad (the Norwegian

Agency for Development Cooperation) is a directorate under the Norwegian Ministry of Foreign Affairs (MFA). It will ensure that grant and support provided through international and Norwegian partners contributes effectively to grantees (Norad, 2010). What MiN Boutique needs to do here is to transport those collected jeans to Norad’s collecting center. According to the agreement between Norad and MiN Boutique, Norad will pay the expenses of delivering the donated jeans to its collecting center. And handling such donated jeans is free for MiN Boutique.

In Min Boutique’s plan, P_2 of collected jeans those are good will be sent to Africa as donations, we thus can calculate the related expenditure:

(Unit: NOK)

Cost of collected jeans used in disposition decision B	$C_c \times Q_j \times P_2$
Transportation cost of delivering jeans to Norad’s station	0
Handling cost charged by Norad	0
Total Costs of disposition decision B	$C_c \times Q_j \times P_2$

Table 6. List of Costs, Disposition Decision B

Sending used-jeans to Africa through Norad is the first try for MiN Boutique to contribute something in social area, theoretically, MiN Boutique will probably benefit in the following ways:

- Having established a good relationship with local authorities (in Africa), they may offer us some privileges.
- Our competitiveness in African market has been enhanced through philanthropy. When we enter that market, some specialized inputs like human resources may be already available.
- When we enter the market, local customers may have the demand on our products.
- Good reputation will be a reward to our contributions.

5.3 Disposition Decision C: Remanufacturing in the UK – shoe production

As illustrated in Figure 5, customers bring their unwanted jeans to MIN Boutique’s stores in Molde. Jeans are collected and sorted there, and then are shipped to the factory in the UK. Once the sandals are made, they will then be sent back to MIN Boutique for sale.

5.3.1 Environmental impact

As mentioned before, this year MIN Boutique intends to use some of the collected jeans as raw material of a new type of shoes because they think this project is environmentally friendly and it is a great way to do their bit for the environment. Fortunately, they have found a company in the UK which is able to make their dream come true. The company, Softwalker, says that the eco-sandals which are made of jeans in its plant have the lowest carbon footprint among all recycled footwear all over the world (Softwalker Official Website, 2011). Moreover, compared with normal shoes, these shoes save substantial on processing chemicals during the manufacture.

5.3.2 Pricing strategies to support economic sustainability

So as to survive, MIN Boutique must ensure that this plan is economic sustainable in the long run. That is to say, MIN Boutique needs to set a “fair” price for this new product that can make profit at least. In this section, we are going to present several pricing methods to support MIN Boutique’s objective. And the way to avoid pricing war generated by pricing strategy will also be proposed.

Table 7. indicates different costs in Disposition Decision C. Besides the costs of collected jeans used to recycle and purchasing costs of remanufactured sandals (assume that one jeans to recycle can get one pair of shoes back), outbound and inbound transportation costs, labor cost and tax are included. In addition, MIN Boutique also takes marketing cost into account. The company decided that 1% of profits from the scheme will be used to cover the expenses of marketing.

(Unit: NOK)

Cost of collected jeans used in disposition decision C	$C_c \times Q_j \times P_3$
Outbound transportation cost	1500
Purchasing cost of remanufactured sandals	$C_r \times Q_j \times P_3$
Inbound transportation costs	1500
Tax	$Q_s \cdot P_s \cdot 12\%$
Labor cost	750
Marketing cost	$1\% \cdot (Q_s \cdot P_s - \text{Total cost of the Scheme})$
Total cost of disposition decision C	$3750 + Q \cdot P_3 \cdot (C_c + C_r) + Q_s \cdot P_s \cdot 13\% - 1\% \text{ Total cost of the Scheme}$

Table 7. List of Costs, Disposition Decision C

5.3.2.1 Short-term Pricing

Usually, when a company wants to introduce its new products to the market, there are two pricing tactics to be considered: penetration pricing and skimming pricing.

- Penetration pricing

It is a strategy that a company takes to set its price of new product at a relatively low level, sometimes even lower than the costs. When enterprise prefers to take part in sharp competition in a new market, penetration pricing could be a useful tool. New entrants are usually prevented from entering the market by a low penetration price. Once the expected market share has been captured, the price can be raised gradually.

- Skimming pricing

Skimming pricing strategy applies to customers who are willing to pay high reservation prices to have the new product as soon as possible. (Milling and Maier, 1993) A company usually sets its price at a premium to earn a very high profit margin per unit, and this is often used for prestigious or unique products. Subsequent price reductions would follow with the decrease of “early demand”.

To adopt which pricing strategy depends on the expectations of the company. Penetration pricing results in a faster acceptance of a new product, but lower unit profits while skimming pricing comes out higher unit profits but smaller initial sales volume (Pandey, 2007, pp.27). Because MiN Boutique wants to be the pioneer to the recycled products' market and the recycled sandals are first sold in Molde, quick acceptance of them is rather important. So we suggest a penetration pricing to apply.

Before we set the specific price for the product, we also need to know what the minimum price is. John Sloman in his book Economics (pp.70, 2006) defines that “minimum price is a price floor set by the government or some other agency. The price is not allowed to fall below this level (although it is allowed to rise above it).” That is to say, the minimum price is the lower bound of penetration price.

In our case, we also define a minimal unit price as the breakeven point of our company, which equals to the unit costs of a sold item.

$$\text{Minimal unit price} = \text{unit costs} = \frac{\text{total costs}}{\text{expected sales volume}}$$

Note: We assume that there is no leftover inventory of sandals.

Based on minimal unit price, we can then set the price suited the pricing tactic we choose. Note that price can be changed soon after that the company thinks it needs.

5.3.2.2 Long-run pricing

PED-based pricing:

After the sandal has been well introduced to the market, we then can change the price to satisfy the company's long-run target and/or to deal with latent competitors. As Nagel (1987, pp.30) mentioned in his book “*The strategy and tactics of pricing*”, pricing decision involves evaluating the consequence of a price change or a price difference. Price Elasticity of Demand (PED) - a measure of the sensitivity of the quantity demanded of a good to a change in its price, other things remaining the same - is usually negative since the demand increases along with the decrease of price. Figure 9. shows the change.

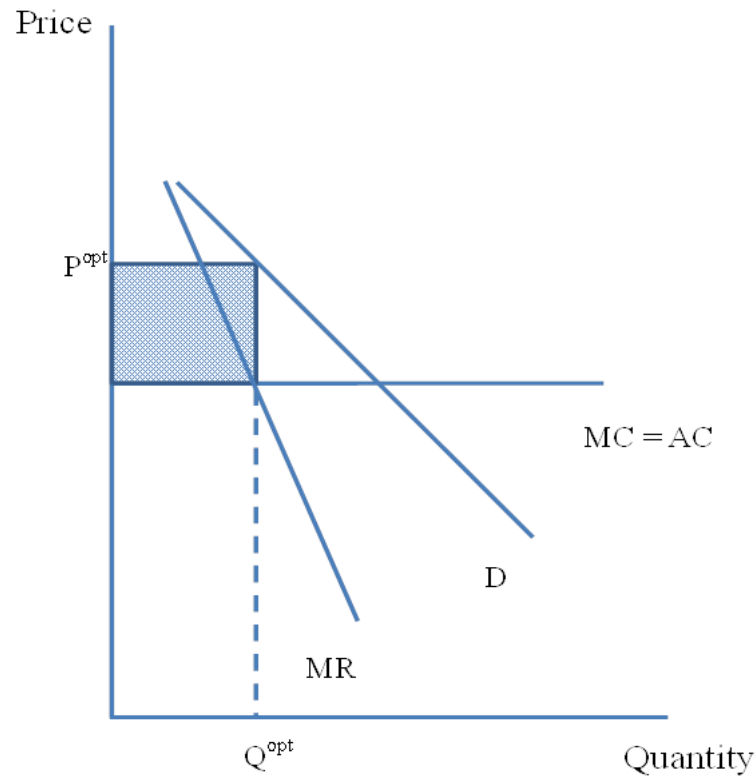


Figure 9. Profit maximization

In the market, the demand (D) is relatively elastic and market-oriented due to price changing and other substitutes. When its marginal revenue (MR) equals to the marginal cost (MC), the intersection (Q^{opt}) is the optimal sales volume where the matching price per unit is P^{opt} .

And we also know that profit maximization is the ultimate goal in the long-run of Min Boutique, so we can establish the following conceptual mathematical model to show the correlation between profit and price.

Following notations will be used in the PED-based models:

ε = price elasticity of demand;

P = the price of introducing remanufactured sandals to the market, in NOK/ unit;

Q = the corresponding sales volume of remanufactured sandals when the price is P , units;

P^{opt} = the optimal price of remanufactured sandals, in NOK/ unit;

Q^{opt} = the corresponding sales volume of remanufactured sandals when the price is P^{opt} , units;

π = the total profit of selling remanufactured sandals, NOK;

V_c = the unit variable cost of selling remanufactured sandals, in NOK/ unit;

F_c = the total fixed cost of selling remanufactured sandals, NOK.

$$\varepsilon = \frac{\frac{\Delta Q}{Q}}{\frac{\Delta P}{P}} = \frac{\frac{Q^{opt} - Q}{Q}}{\frac{P^{opt} - P}{P}} \quad (5.1)$$

$$\frac{\varepsilon \cdot (P^{opt} - P)}{P} = \frac{Q^{opt} - Q}{Q}$$

$$\frac{Q}{P} \cdot \varepsilon \cdot (P^{opt} - P) = Q^{opt} - Q$$

$$\frac{Q}{P} \cdot \varepsilon \cdot (P^{opt} - P) + Q = Q^{opt} \quad (5.2)$$

$$\pi = P^{opt} \cdot Q^{opt} - V_c \cdot Q^{opt} - F_c \quad (5.3)$$

Equation 5.2 shows the correlation between optimal sales volume Q^{opt} and its matching unit price P^{opt} . Equation 5.3 is the expression of total profit earned by selling Q^{opt} number of product at price P^{opt} .

According to the combination of equation 5.1 and 5.2, we get a profit relevant equation 5.4.

$$\pi = \frac{Q}{P} \cdot \varepsilon \cdot P^{opt2} - \left[(\varepsilon - 1) + \frac{\varepsilon \cdot V_c}{P} \right] \cdot Q \cdot P^{opt} - V_c \cdot Q - F_c + V_c \cdot Q \cdot \varepsilon \quad (5.4)$$

In order to maximize profit, we differentiate P^{opt} and let the outcome equal to 0.

$$\frac{d\pi}{dP^{opt}} = 2 \cdot P^{opt} \cdot \frac{Q}{P} \cdot \varepsilon - \left[(\varepsilon - 1) + \frac{\varepsilon \cdot V_c}{P} \right] \cdot Q = 0$$

$$P^{opt} = \frac{1}{2} \cdot \left(\frac{\varepsilon - 1}{\varepsilon} \cdot P + V_c \right)$$

Note: Maybe we cannot get ε in advance since this is a brand new product for both our company and our target market. However, only the raw material of it differs from other sandals in the market while all functional attributes remain the same. Probably we can use ε of similar products in same target market.

Here is another way to get the “fair” price:

In economics, the quantity of good purchased, Q , in a specific market, can be modeled as a linear function of the price that product, P . Thus, a linear equation showing their interrelationship was approximated as follows:

$$Q = b + kP$$

where Q is the dependent variable, P is the independent variable, b is the intercept on Y , and k is the slope of this line or the change in quantity Q for every unit change in price P .

And we know that the quantity of fashion apparel purchased in real life is also influenced by some other factors, including identifiable factors such as the competitors' price, advertising campaign, trend, etc. and some unknown factors. Newbold et al. (2009, pp.448) in their book further elaborated a more reasonable model, using an error term ε to indicate the effect brought by all other factors:

$$Q = b + kP + \varepsilon$$

Based on this, we build up a function of profit earned by selling remanufactured sandals as follows:

$$\begin{aligned} \pi &= P \cdot Q - V_c \cdot Q - F_c \\ &= k \cdot P^2 + b \cdot P + \varepsilon \cdot P - V_c \cdot k \cdot P - b \cdot V_c + \varepsilon \cdot V_c - F_c \\ &= k \cdot P^2 + (b + \varepsilon - V_c \cdot k) \cdot P - (b - \varepsilon) \cdot V_c - F_c \end{aligned} \quad (5.5)$$

P = the price of remanufactured sandals, in NOK/ unit;

Q = the corresponding sales volume of remanufactured sandals when the price is P , units;

π = the total profit of selling remanufactured sandals, NOK;

V_c = the unit variable cost of selling remanufactured sandals, in NOK/ unit;

F_c = the total fixed cost of selling remanufactured sandals, NOK;

k, b, ε = constant.

To maximize the profit, we differentiate equation 5.5 and let

$$\frac{d\pi}{dP} = 0$$

Finally we get

$$P = \frac{V_c \cdot k - b - \varepsilon}{2k} \quad (5.6)$$

And after we get enough data (usually the data sample size is no smaller than 50) of price P and sales volume Q, we can do a regression to get k and b and ϵ by using SPSS.

Cost-based pricing:

As Subramanian (2010) proposed, some companies chose cost-based pricing methods as their remanufactured products pricing strategies. Here, we also present two most common methods of cost-based pricing: markup pricing and target return pricing.

Markup pricing

Markup refers to the difference between unit cost of products and their selling price. Markup pricing could undertake a given return over cost for company.

$$\text{Markup Price} = \frac{\text{Unit Cost}}{1 - \text{expected return rate on sales}} \quad (5.7)$$

Target return pricing

Target return pricing promises to ensure a given return on capital. When expected return on investment equals to expected return rate on sales, and invested capital equals to total cost, target return price will be the same as markup price.

$$\text{Target return Price} = \text{Unit Cost} + \frac{\text{Expected return on investment} \times \text{Invested capital}}{\text{Unit Sales}}$$

Breakeven analysis

Company may not set a fixed price for products during long term operating. Breakeven analysis is a useful tool for the company to predict the consequence of price changing. Nagel (1987, pp.45) gave out the equations for calculating the percent breakeven sale change. The equations are shown as follows (the proof of the equations shown in the Appendix):

Notations in breakeven sale analysis

P	=	Price/Unit
C _v	=	Variable Cost
CM	=	The contribution margin per unit (in terms of monetary value)

$\Delta P\%$ = Percentage of price change

$$CM = P - C_v$$

$$CM\% = \frac{CM}{P}$$

$$\text{Breakeven sales change\%} = \frac{-\Delta P\%}{CM\% + \Delta P\%} \times 100\%$$

$$\text{Unit Breakeven sales change} = \text{Breakeven sales change\%} \times \text{Sales}$$

Assuming that the company is considering a $\Delta P\%$ price cut which the company believes would increase its sales, the final results got from the equations shows that only if the sales would increase by more than Breakeven sales change%, or Unit Breakeven sales change, the company could keep its profits in current level.

5.3.2.3 Competitors' reaction

To determine long-term pricing strategy, the company should also take consumers' and competitors' responses into consideration. After appropriate pricing strategy has been decided, competitors will react to the consequences incurred by the pricing strategy. Both the company and the competitors may take part in the price competition. When the competition becomes cut-throat, both of them will be trapped into "lose-lose" situation. To prevent the company from destructive price competition, the following principles could be implementing (Dunne, 1998):

- *Choose your game.*

Not every competitive game is proper, worthy and compulsory to enter for. To avoid price war, company's decision maker should come up with pricing strategies which could reduce competitors' aggression on price.

- *Understand each player's role.*

The company should distinguish who is the current rival and who is the potential competitor and care about both of them.

- *Understand what strategies are available to the competitors.*

The company should attempt to find out its competitors' weaknesses and take appropriate tactics to defeat them.

- *Understand what information is available.*

Cut-throat price competitions usually begin with one's misunderstanding of others' intentions (Dunne, 1998). In order to predict competitors' reactions, a company needs to know what information about itself is reachable for them.

- *Learn the competitors' payoffs.*

To understand what will the competitors gain or lose in the game is also important.

- *Understand what drives your competitors' behaviour.*

So as to early prepare for the rival's movement, one needs to examine what incentives they have and how they responded to past strategic changes.

- *Provide incentives for co-operation and penalties for defection.*

It is critical to clearly show your competitors your intentions to achieve a "win-win" situation.

Cooperative pricing means that the company makes price changes cooperatively with its competitors (Nagel, 1981, pp. 86). No matter how price changes, the price set by each company in the market should keep in the same level in such strategy. In *opportunistic pricing* strategy, in order to increase company's market share, the company postpones relevant reactions when its competitors raise price. But when the competitors lower the price, under such pricing strategy, the company should take the reaction immediately to seize the expanded market which is created by the price cut (Nagel, 1981, pp. 89).

Nagel (1981, pp. 91) recommend a series of evaluating process to avoid "lose-lose" dilemma. The steps of evaluations start from company's self-evaluation, through recognizing competitor's abilities and willingness to identify the company's pricing strategy. Figure 10. demonstrates the evaluation procedure which leads to either cooperative or opportunistic pricing.

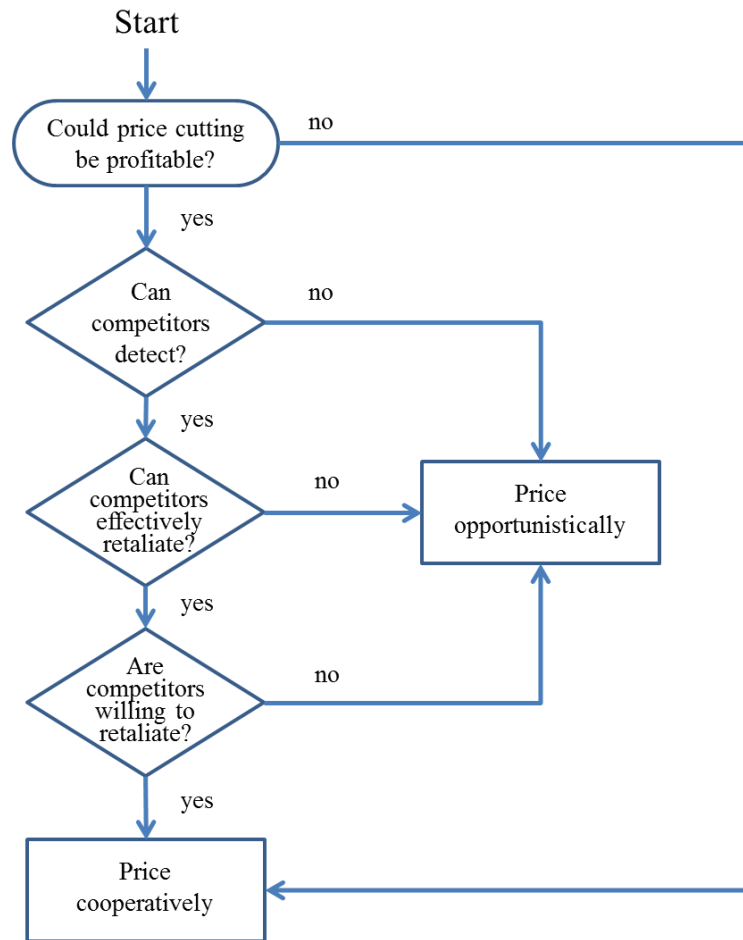


Figure 10. Procedures of evaluating competitors' capabilities and intentions (Nagel, 1981, pp.91)

5.4 Disposition Decision D: Sending to vintage store

A vintage store is a store that sells clothes from earlier years, most often (but not always) earlier than the 80s. Another definition of clothes sold in vintage store is high-end designer gowns. One-of-a-kind designs by designers such as Halston or Versace can be considered vintage after only a short time period. In fashion, “retro” is sometimes alternatively said with “vintage”, denoting an exceptional example of period clothing, or clothing which still has some commercial appeal despite its age (Pollick, 2011). Besides, clothes that are donated by celebrities or with pop stars’ icon on them can also be labeled as “vintage”.

This year, MiN Boutique believes that “retro” would be the theme of jeans’ fashion. Thus they intend to sell part of the collected jeans with classic styles to vintage store in Oslo. They also want to invite some pop stars to autograph those jeans to attract public attention.

The expected selling price is 1000 NOK for each pair of jeans. We then compute the cost and revenue of doing so below:

(Unit: NOK)

Cost of collected jeans used in disposition decision D	$Q_j \times P_4 \times C_c$
Total cost of disposition decision D	$Q_j \times P_4 \times C_c$

Table 8. List of Costs, Disposition Decision D

$$\text{Revenue of resale} = 1000 \times Q \times P_4 \quad (\text{NOK})$$

5.5 Economic issues of the Scheme

Based on the work we have done from section 5.1 to 5.4, we now get the equation of total costs of the scheme:

$$\begin{aligned} \text{Total costs of the scheme} = & \text{total cost of disposition decision A} + \text{total cost of disposition} \\ & \text{decision B} + \text{total cost of disposition decision C} + \text{total cost of} \\ & \text{disposition decision D} \quad (5.8) \end{aligned}$$

And the equation of total revenue:

$$\text{Total revenue} = \text{revenue of selling recycled shoes} + \text{revenue of jeans' resale} \quad (5.9)$$

From the point of view of MiN Boutique, this project is feasible only if it has the economic sustainability. That is to say, only **equation 5.8 – equation 5.9 > 0**, this project makes sense in the long run.

The data listed below are provided by MiN Boutique:

$Q_j = 500$, expected total amount of the collected jeans;

$P_1 = 25\%$, percentage of the collected jeans that are treated as garbage;

$P_2 = 29\%$, percentage of the collected jeans that are sent to Africa for philanthropy;

$P_3 = 45\%$, percentage of the collected jeans that are sent to the UK as raw material of recycled shoes;

$P_4 = 1\%$, percentage of the collected jeans that are sent to vintage store in Oslo for sale;

$C_c = 50$ NOK, price of the coupon used in jean's collection stage;

$C_g = 1.472$ NOK, unit disposal cost of the collected jeans that are treated as garbage;

$C_r = 200$ NOK/Pair, unit cost of remanufactured sandal.

$$\begin{aligned}\text{Total Cost of Disposition decision A} &= Q_j \cdot P_1 \cdot (C_c + C_g) \\ &= 500 \times 25\% \times (50 + 1.472) = 6434 \text{ NOK}\end{aligned}$$

$$\begin{aligned}\text{Total Cost of Disposition decision B} &= Q_j \times P_2 \times C_c \\ &= 500 \times 29\% \times 50 = 7250 \text{ NOK}\end{aligned}$$

$$\begin{aligned}\text{Total Cost of Disposition decision C} \\ &= 3750 + Q_j \cdot P_3 \cdot (C_c + C_r) + 13\% \cdot Q_s \cdot P_s - 1\% \\ &\cdot \textit{Total cost of the Scheme} \\ &= 3750 + 500 \times 45\% \times (50 + 200) + 13\% \cdot Q_s \cdot P_s - 1\% \\ &\cdot \textit{Total cost of the Scheme} \\ &= 60000 + 13\% \cdot Q_s \cdot P_s - 1\% \cdot \textit{Total cost of the Scheme}\end{aligned}$$

$$\text{Total Cost of Disposition decision D} = Q_j \times P_4 \times C_c = 500 \times 1\% \times 50 = 250 \text{ NOK}$$

Now we plus all four disposition decisions' cost together, get,

$$\text{Total Cost of the Scheme} = \frac{73934 + 13\% \cdot Q_s \cdot P_s}{1.01}$$

Pricing

Among the all four decisions the company takes, Disposition Decision C is the one which could give the company most positive economic impact. As MiN Boutique required, sales amount of all remanufactured sandals should cover all costs in the scheme. In other words, all cost should be averagely apportioned to each pair of shoes sold. We denote P_b and Q_b as the breakeven price of each pair sold and breakeven sales of the sandals respectively. When $Q_b = Q_s$ and the company is selling the sandals in price P_b , the sandals' sales amount equals to total costs of the scheme, then we get the equation below.

$$\text{Total Cost of the Scheme} = \frac{73934 + 13\% \cdot Q_b \cdot P_s}{1.01} = Q_b \cdot P_b$$

$$P_b = \frac{73934 + 13\% \cdot P_s \cdot Q_b}{1.01 \times Q_b}$$

As expected return rate on sales for MiN Boutique is 50%, we are going to apply markup pricing to calculate the selling price of remanufactured sandals. We apply equation 5.7, let P_s = Markup price, and P_b = Unit Cost, then get,

$$P_b = \frac{73934 + 13\% \cdot P_s \cdot Q_b}{1.01 \times Q_b} = P_s \times (1 - 50\%) \quad (5.10)$$

The company also anticipates that the sandals purchased from the UK are sold out in the scheme, so $Q_b = Q_j \times P_3 = 225$,

$$P_b = \frac{73934 + 13\% \cdot P_s \cdot 225}{1.01 \times 225} = P_s \times (1 - 50\%)$$

Solving this equation, then get

$$P_s = \frac{591472}{675} \approx 876 \text{ NOK}$$

If the unit price of remanufactured sandal is 876 NOK, and after all the sandals are sold out, MiN boutique will meet its anticipation.

Put P_s into equation 5.10, we get

$$P_b = \frac{295736}{675} \approx 438 \text{ NOK}$$

This means that if selling price of each remanufactured sandal is 438 NOK, and after all the sandals are sold out, MiN boutique could keep breakeven of implementing the scheme.

As we suggested before, penetration pricing is our short-term pricing strategy when introducing the sandals to the market. Current prices of similar products from competitors range from 699 NOK to 1100 NOK. To efficiently enter the market, we suggest MiN Boutique price its sandals at between 438 NOK and 699 NOK in the introduction stage. In this way our price will be very competitive and can also maintain some profitability. In MiN Boutique's plan, at most 5% of the remanufactured sandals could be recognized as give away. That means Q_s will be smaller than 225. To pursue the expected total profits,

MiN Boutique needs to change the sandals price in long term.

We denote P_n and Q_n as new price and sales volume of the sandals respectively in the company's long term running. And for easy calculation, we further assume that MiN Boutique does not gain or lose in money during short run when applying penetration pricing strategy. Since the company's expected return rate of the scheme does not change, 50% still, then we get,

$$P_n \cdot Q_n - \text{Total Cost of the Scheme} = P_n \cdot Q_n - \frac{73934 + 13\% \cdot P_n \cdot Q_n}{1.01} = P_n \cdot Q_n \cdot 50\%$$

To simplify the equation above, we get,

$$Q_n = \frac{73934}{0.375 \times P_n} \quad (5.11)$$

As equation 5.11 indicates, relationship between Q_n and P_n is inverse, which means decreasing in Q_n will result in P_n 's increasing. To maintain the total profits of the scheme in the company's expected level, 876 will be the lower bound of the price interval in the long term. And in order to keep the price of the sandals fluctuating in the normal range, the upper bound of the P_n could not be greater than 1100 NOK. By using excel, we calculated corresponding Q_n to each P_n from 876 to 1100. Detailed results are shown in the appendix D. We note that setting price around 920 NOK can 100% ensure MiN Boutique a 50% profit.

6. Conclusions

From the research on the case, we have following findings:

1. Collecting jeans that are to be disposed of from households, we could not only increase the recovery rate of textile waste but are very friendly to the environment.
2. On the surface, philanthropy may not bring direct economic benefits to MiN Boutique. However, benefits like enhanced competitiveness, fame and reputation derived from charitable donations can help us attract more potential buyers. Thus if we factor this into account, doing philanthropy, will, on the whole, contribute to MiN Boutique's success.
3. Based on our assumptions and the data from our case company, the results presented in section 5.5 indicate that MiN Boutique could realize its economic expectation if it is to price the remanufactured sandal within the range of 915 NOK and 923 NOK.

We hope that what we have done in this thesis could to some extent help MiN Boutique in practice. And we would be more than happy if our conclusion is useful to any further research. Because MiN Boutique intends to act as an intermediary between remanufacturers and retailers in the future through propagating its “recycling” idea, we suggest a further research on *as an agency, how to price varied products in consideration of retailers' reaction.*

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Appendices

A: Waste in Norway, by material (1995-2009). 1 000 tons (Statistics Norway, 2010a)

Year	Total ¹	Paper, cardboard and pasteboard	Metals	Plastics	Glass	Wood waste	Textiles	Wet organic waste	Concrete and bricks	Sludge	Other	Hazardous waste
1995	7 342	887	919	327	189	1 328	109	1 070	533	328	1 020	632
1996	7 488	980	956	349	179	1 327	113	1 086	554	323	997	625
1997	7 654	976	959	360	182	1 300	115	1 112	571	329	1 134	617
1998	8 002	1 009	945	366	189	1 301	116	1 182	655	328	1 303	609
1999	8 182	1 031	934	374	191	1 263	115	1 236	669	334	1 432	601
2000	8 408	1 081	936	380	198	1 311	113	1 270	658	344	1 445	672
2001	8 555	1 071	940	388	208	1 367	112	1 302	690	357	1 477	642
2002	8 722	1 060	935	400	219	1 420	111	1 363	697	371	1 490	658
2003	9 011	1 017	953	414	232	1 438	111	1 349	657	381	1 593	867
2004	9 141	1 092	994	426	231	1 385	113	1 413	634	384	1 542	927
2005	9 747	1 177	1 054	437	251	1 481	116	1 490	739	408	1 627	966
2006	10 109	1 226	1 097	467	254	1 471	118	1 628	687	380	1 695	1 085
2007	10 739	1 235	1 105	492	278	1 626	124	1 743	821	401	1 836	1 077
2008	10 858	1 188	1 134	507	281	1 664	130	1 778	804	404	1 845	1 123
2009	10 400	1 200	1 100	510	270	1 600	130	1 700	700	390	1 700	1 100

1. The waste amount from ships and big constructions, as oil platforms, are counted as the average for the whole period from 1995 to 2009

B: Waste in Norway, by source and material (2008), treatment and material (2008). 1 000 tons (Statistics Norway, 2010a)

By source and material (2008)	Total ¹	Paper, cardboard and pasteboard	Metals	Plastics	Glass	Wood waste	Textiles	Wet organic waste	Concrete and bricks	Sludge	Other	Hazardous waste
Total	10 858	1 188	1 134	507	281	1 664	130	1 778	804	404	1 845	1 123
Households ²	2 186	475	205	153	79	372	52	555	3	0	262	28
Agriculture, forestry and fishing	145	7	12	22	⁴ 1	⁴ 1	4	97	0	0	⁴ 1	2
Mining and quarrying	206	10	23	4	⁴ 1	11	⁴ 1	8	8	0	9	130
Manufacturing	4 031	205	222	69	49	763	12	700	134	296	950	632
Electricity, gas and water supply	49	1	4	⁴ 1	0	2	0	⁴ 1	1	0	1	37
Construction	1 461	19	62	15	83	237	⁴ 4	⁴ 28	655	0	344	13
Service industries	1 947	471	140	155	53	208	⁴ 46	389	4	107	277	95
Other or unspecified	834	0	466	88	15	69	11	0	0	0	0	186
By treatment/disposal and material (2008)³												
Total	10 858	1 188	1 134	507	281	1 664	130	1 778	804	404	1 845	1 123
Sorted for material recovery	3 388	676	1 033	71	109	414	12	539	100	102	279	52
Biological treatment	455	0	0	0	0	152	0	235	0	69	0	0
Energy recovery	2 056	177	0	146	0	828	44	420	0	122	206	112
Filling compound and cover material	530	7	0	0	⁴ 12	15	0	26	⁴ 44	14	411	0
Incineration without energy recovery	464	52	⁴ 39	41	⁴ 50	73	13	126	0	0	24	46
Landfill	2 123	189	37	156	110	182	52	191	240	39	247	679
Other final treatment	234	0	0	0	0	0	0	0	0	0	0	234
Other or unspecified	1 608	86	25	93	0	0	7	241	419	58	677	0

1. The waste amount from ships and big constructions, as oil platforms, are counted as the average for the whole period from 1995 to 2009.
2. Includes scrapped cars and motor bikes, and paper burnt at home.
3. Exported waste is categorised according to the treatment or disposal it undergoes in the destination country, insofar this treatment or disposal method is known. Exported waste for which the treatment or disposal method is unknown, is categorized as unknown or unspecified. Imported waste is not covered by the statistics.
4. The figure was corrected 27 October 2010 at 14:15 p.m.

C: Proof of the break-even equations (Nagel, 1981, pp.45)

P	Initial Price
ΔP	Changes in Price
C	Unit Cost
Q	Initial Quantity of Sales
ΔQ	Changes in Sales
R	Initial Profits on sales
R'	Profits on sales after price changed

Initial profits on sales are $R = (P - C)Q$

After price changed, the profits are $R' = (P + \Delta P - C)(Q + \Delta Q)$

Let $R=R'$, we get

$$(P - C)Q = (P + \Delta P - C)(Q + \Delta Q)$$

$$PQ - CQ = PQ + \Delta PQ - CQ + P \Delta Q + \Delta P \Delta Q - C \Delta Q$$

By subtracting PQ and adding CQ to both sides, we obtain

$$0 = \Delta PQ + P \Delta Q + \Delta P \Delta Q - C \Delta Q$$

$$\Delta Q = \frac{-\Delta PQ}{P + \Delta P - C}$$

Through dividing by Q on each side and multiplying $\frac{1}{P}$ on denominator and numerator in right side, we get

$$\frac{\Delta Q}{Q} = \frac{\frac{-\Delta P}{P}}{\frac{P-C}{P} + \frac{\Delta P}{P}}$$

$\frac{\Delta Q}{Q}$ is the percentage of breakeven sales change

$\frac{\Delta P}{P}$ is the percentage of price change

$\frac{P-C}{P}$ is the percentage of contribute margin

Then we get the equation: Breakeven sales change% = $\frac{-\Delta P\%}{CM\% + \Delta P\%} \times 100$

D: Price list from Jan. 2011, Retura

Plastfolie	Kr 0,- pr. tonn
Plastemballasje	Kr 0,- pr. tonn
EE-avfall	Kr 0,- pr. tonn
Papp	Kr 0,- pr. tonn
Hele paller i stabel	Kr 0,- pr. tonn
Papir	Kr. 868,- pr. tonn
Rent trevirke	Kr. 519,- pr. tonn
Urent trevirke	Kr. 910,- pr. tonn
Impregnert trevirke	Kr. 2.450,- pr. tonn
Glass	Kr. 400,- pr. tonn
Matavfall	Kr. 1.090,- pr. tonn
Restavfall/ Brennbart	Kr. 1.840,- pr. tonn
Blandet avf. til sortering	Kr. 1.840,- pr. tonn

E: Corresponding Q_n to each P_n from 876 to 1100 NOK

P_s	Q_s	Give Away	Percentage of give away
876	225	0	0%
877	225	0	0%
878	225	0	0%
879	224	1	0%
880	224	1	0%
881	224	1	0%
882	224	1	0%
883	223	2	1%
884	223	2	1%
885	223	2	1%
886	223	2	1%
887	222	3	1%
888	222	3	1%
889	222	3	1%
890	222	3	1%
891	221	4	2%
892	221	4	2%
893	221	4	2%
894	221	4	2%
895	220	5	2%
896	220	5	2%
897	220	5	2%
898	220	5	2%
899	219	6	3%
900	219	6	3%
901	219	6	3%
902	219	6	3%
903	218	7	3%
904	218	7	3%
905	218	7	3%
906	218	7	3%
907	217	8	4%
908	217	8	4%
909	217	8	4%
910	217	8	4%
911	216	9	4%
912	216	9	4%
913	216	9	4%
914	216	9	4%
915	215	10	5%
916	215	10	5%

P_s	Q_s	Give Away	Percentage of give away
917	215	10	5%
918	215	10	5%
919	215	10	5%
920	214	11	5%
921	214	11	5%
922	214	11	5%
923	214	11	5%
924	213	12	6%
925	213	12	6%
926	213	12	6%
927	213	12	6%
928	212	13	6%
929	212	13	6%
930	212	13	6%
931	212	13	6%
932	212	13	6%
933	211	14	7%
934	211	14	7%
935	211	14	7%
936	211	14	7%
937	210	15	7%
938	210	15	7%
939	210	15	7%
940	210	15	7%
941	210	15	7%
942	209	16	8%
943	209	16	8%
944	209	16	8%
945	209	16	8%
946	208	17	8%
947	208	17	8%
948	208	17	8%
949	208	17	8%
950	208	17	8%
951	207	18	9%
952	207	18	9%
953	207	18	9%
954	207	18	9%
955	206	19	9%
956	206	19	9%
957	206	19	9%

Ps	Qs	Give Away	Percentage of give away
958	206	19	9%
959	206	19	9%
960	205	20	10%
961	205	20	10%
962	205	20	10%
963	205	20	10%
964	205	20	10%
965	204	21	10%
966	204	21	10%
967	204	21	10%
968	204	21	10%
969	203	22	11%
970	203	22	11%
971	203	22	11%
972	203	22	11%
973	203	22	11%
974	202	23	11%
975	202	23	11%
976	202	23	11%
977	202	23	11%
978	202	23	11%
979	201	24	12%
980	201	24	12%
981	201	24	12%
982	201	24	12%
983	201	24	12%
984	200	25	13%
985	200	25	13%
986	200	25	13%
987	200	25	13%
988	200	25	13%
989	199	26	13%
990	199	26	13%
991	199	26	13%
992	199	26	13%
993	199	26	13%
994	198	27	14%
995	198	27	14%
996	198	27	14%
997	198	27	14%
998	198	27	14%

Ps	Qs	Give Away	Percentage of give away
999	197	28	14%
1000	197	28	14%
1001	197	28	14%
1002	197	28	14%
1003	197	28	14%
1004	196	29	15%
1005	196	29	15%
1006	196	29	15%
1007	196	29	15%
1008	196	29	15%
1009	195	30	15%
1010	195	30	15%
1011	195	30	15%
1012	195	30	15%
1013	195	30	15%
1014	194	31	16%
1015	194	31	16%
1016	194	31	16%
1017	194	31	16%
1018	194	31	16%
1019	193	32	17%
1020	193	32	17%
1021	193	32	17%
1022	193	32	17%
1023	193	32	17%
1024	193	32	17%
1025	192	33	17%
1026	192	33	17%
1027	192	33	17%
1028	192	33	17%
1029	192	33	17%
1030	191	34	18%
1031	191	34	18%
1032	191	34	18%
1033	191	34	18%
1034	191	34	18%
1035	190	35	18%
1036	190	35	18%
1037	190	35	18%
1038	190	35	18%
1039	190	35	18%

Ps	Qs	Give Away	Percentage of give away
1040	190	35	18%
1041	189	36	19%
1042	189	36	19%
1043	189	36	19%
1044	189	36	19%
1045	189	36	19%
1046	188	37	20%
1047	188	37	20%
1048	188	37	20%
1049	188	37	20%
1050	188	37	20%
1051	188	37	20%
1052	187	38	20%
1053	187	38	20%
1054	187	38	20%
1055	187	38	20%
1056	187	38	20%
1057	187	38	20%
1058	186	39	21%
1059	186	39	21%
1060	186	39	21%
1061	186	39	21%
1062	186	39	21%
1063	185	40	22%
1064	185	40	22%
1065	185	40	22%
1066	185	40	22%
1067	185	40	22%
1068	185	40	22%
1069	184	41	22%
1070	184	41	22%
1071	184	41	22%
1072	184	41	22%
1073	184	41	22%
1074	184	41	22%
1075	183	42	23%
1076	183	42	23%
1077	183	42	23%
1078	183	42	23%
1079	183	42	23%
1080	183	42	23%

Ps	Qs	Give Away	Percentage of give away
1081	182	43	24%
1082	182	43	24%
1083	182	43	24%
1084	182	43	24%
1085	182	43	24%
1086	182	43	24%
1087	181	44	24%
1088	181	44	24%
1089	181	44	24%
1090	181	44	24%
1091	181	44	24%
1092	181	44	24%
1093	180	45	25%
1094	180	45	25%
1095	180	45	25%
1096	180	45	25%
1097	180	45	25%
1098	180	45	25%
1099	179	46	26%
1100	179	46	26%