Supply chain sustainability in the fashion industry: an exploratory study

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Abstract

Literature has increasingly highlighted the importance of sustainable development. By considering literature streams on environmental and social sustainability at the supply chain level, this paper aims to analyse which are the main drivers that are pushing fashion companies towards these new goals and which supply chain sustainability practices are implemented by fashion companies. Multiple case studies were conducted to achieve our purposes. On the whole, preliminary findings support sustainability is becoming a critical and competitive issue for this industry and identify some best practices that leading companies are adopting.

Keywords: Supply chain management; Social sustainability; Environmental sustainability.

Introduction

In recent years, the literature on supply chain management (SCM) has increasingly investigated sustainability issues, extending them to the entire supply network (Seuring and Goldbach, 2005) highlighting that sustainability may drive companies to achieve at the same time social, environmental and economic goals, improving their long-term economic performance (Carter and Rogers, 2008).

The fashion industry, in which product lifecycles are very short and differentiation advantages are often built on product style, is one of the most challenging sectors from a sustainability point of view (Caniato et al., 2012). Many scandals, such as the Rana Plaza (Dhakka, Bangladesh) one in 2013, have negatively impacted on fashion brands (Seuring and Muller, 2008) and helped to raise attention to issues related to environmental, safety and work conditions. Moreover, different Non-Governmental Organizations initiatives, such as Greenpeace's "Detox Fashion" campaign, have underlined the pollution produced by fashion and textile production.

Such events have increased customers' and companies' interest in sustainability (Seuring and Muller, 2008; Fernando and Almeida, 2012; Våland and Heide, 2005,). Customers are even more prompt to consider sustainability question and for instance the sales of products using organic cotton shows an important increase in the last years (Organic Exchange, 2010). The literature already approached the problem of identifying the drivers of a sustainable change (De Brito et al., 2008), as well as sustainable supply chain practices (Faisal, 2010; Vermeulen and Ras, 2006) and performance improvements (e.g., Tsoulfas and Pappis, 2008) in terms of environmental performance (e.g., emissions, wastes, damages to biodiversity) or of competitiveness (e.g., Rao and Holt, 2005).

However, most of the studies cited above are dedicated to either environmental or social sustainability, but they not consider the two aspects together, and moreover do not focus on the fashion industry, that is one of the most important sectors within the European economy. Fashion is also one of the most important sector in the Italian economy and plays a significant role at the European level. In 2012, EU fashion industry sales equalled approximately €170 billion, being earned by more than 181,000 companies (Sistema Moda Italia, 2013). Among European countries, Italy is responsible for more than 30.9% of turnover and approximately 27.6% of companies, featuring a widespread production system that is frequently organised into industrial districts characterised by a large number of Small and Medium Enterprises (SMEs) (the median company size in the Italian fashion industry is 8.5 employees) and very specific inter-company synergies (Sistema Moda Italia, 2013). Fashion industry is also an international global industry: companies are necessarily required to operate in international contexts from both a production (MacCarthy and Jayarathne, 2009) and a distribution perspective (Bianchi, 2009).

The objective of this study is to understand which sustainability practices are implemented by leading fashion companies to best address both the environmental and social sustainability emerging issues. The paper is organised as follows. The next section provides a literature review on the fashion industry. The following sections describe the research objectives and the methodology. Case studies are presented and discusses. The final section provides and conclusion of the paper

Sustainability in the fashion industry

The concept of sustainability was defined in 1987 in the Bruntland report and then adopted by the United Nations' World Commission on Environment and Development (WCED): "*Sustainability means being able to satisfy current needs without compromising the possibility for future generations to satisfy their own needs*". Recently the debate of sustainability has recognised the relationship among three important principles: economic growth, social equity and respect for the environment (Bansal, 2002). Sustainability initiatives are crucial to companies' strategies, also within the fashion industry in which many companies are now implementing different activities to cope with the sustainability issue. For example, Patagonia decided to use only organic cotton for the production of fashion products (Chouinard and Brown, 1997) and Nike recently involved its partners in sustainability action plans because it was the only way to achieve concrete results (Fromartz, 2009). These phenomena are closely related to the increasing complexity of the preferences expressed by final consumers in the field of sustainability (Caniato et al., 2012). Recent trends indicate that sustainability is a springboard for reaching environmentally conscious consumers and enhancing overall brand image in developed countries (Faisal, 2010).

Some authors have investigated the importance of sustainability to fashion companies, focusing first of all on the concept of social responsibility in the industry (Dickson and Eckman, 2006; Chouinard and Brown, 1997; De Brito et al., 2008). Beyond social responsibility problems, the fashion industry face several environmental problems linked to the production process both at firm plant and at supply chain level. In this view, some authors have investigated the topic of sustainability in fashion production stages (Park and Dickson; 2008), which are characterised by intense use of chemical products and natural resources, resulting in a high environmental impact (Lakhal et al., 2008). Other studies have also considered the impact that a sustainability journey could have on the entire supply chain investigating for instance the role played by different stakeholders (De Brito et al., 2008).

Research objectives

Our empirical research aims at exploring, through multiple case studies, which are the main drivers that are leading fashion companies to undertake the environmental and social sustainability leap and the best practices that these firms are adopting within their operations and supply chains. Our work focuses on the adoption of both green and social practices considering all the stages within a supply chain, from the suppliers till the end customers. The research is carried out by the research team of "Osservatorio Sistema Moda", which encompasses researchers from the Department of Management and Engineering, and Management and Economics of the University of Padua, the Department of Management, Economics and Industrial Engineering of Politecnico di Milano and the Department of Industrial Engineering of the University of Florence (Italy).

Many fashion companies are undertaking the green and social transformation to respond to their stakeholders' requests for more eco-friendly processes and products and ensure that employees at every level of the supply chain operate under socially responsible working conditions.

However, since a request for sustainability is relatively new in the fashion industry, and there is a lack of specific frameworks and tools that could support and accompany fashion companies on this journey, we would like contribute on the following open issues:

RQ1: Which are the main drivers that are urging fashion companies to review their supply chains to address environmental and social sustainability goals?
RQ2: Which are the most relevant best practices adopted by fashion companies to meet environmental and social sustainability goals?

Methodology

Given the exploratory nature of our research, we adopted a multiple case research methodology (Yin, 2003). This methodology is suitable when the phenomenon is not completely understood (Voss et al., 2002). We selected the companies using a theoretical replication logic (Yin, 2003) and, following Eisenhardt (1989), we built the sample according to different criteria. In particular, we selected companies that: (i) operate in the fashion industry; (ii) are medium or large sized; (iii) have the headquarter in Italy; (iv) have international distribution and production networks to address possible different environmental and social national regulations; (v) are investing significant efforts towards the goals of sustainability and their commitment is reported in their annual environmental and CSR reports. Our sample was though composed, among all the companies that met our criteria, of three leading Italian fashion firms that, up to date, hold an important role in the fashion system and are investing big efforts to reconfigure their structures to embed also social and green requirements within their traditional economic business model. The selected companies are a leading firm in the eyewear segment (Beta company) and two world-famous fashion houses (respectively Alpha and Gamma company). The number of selected cases is suitable to ensure sufficient generalizability of the results at the exploratory stage (Eisenhardt, 1989). Furthermore, the selected cases are heterogeneous and so proper to offer a complete overview on the researched issues. Before starting with interviews at the three companies' headquarters, we deepened our knowledge on drivers and practices adopted for environmental and social sustainability through an accurate literature review: though, we were able to understand main drivers, best practices and most used KPIs that are involved when companies address efforts in environmental and social sustainability. This review of the most relevant academic contributions helped us to design the *ad-hoc* research protocol. To gather relevant information for our research, we deployed a highly structured research protocol (Voss et al., 2002) based on the well-known Supply Chain and Operations Reference (SCOR) model (Supply-Chain Council, 2011), a cross-industry standard useful for analysing and improving companies' supply chain processes and performances (Stewart, 1997). This model has the advantage of integrating the concepts of BPR, benchmarking and measurement into a cross-functional framework (Huan et al., 2004), based on the identification of five main supply chain processes, namely Plan, Source, Make, Deliver and Return. Through the adoption of this model it is possible to study an entire supply chain and evaluate processes, performances, but also enhance the knowledge about main competitors, sources of competitive advantages and best practices (Stewart, 1997). Specifically, the protocol was organized to match this model and all questions were grouped in the five main decision areas: Plan, Source, Make, Deliver and Return. This choice allows us to capture complex management processes and decisions in a standard way, describe them and then measure and compare them (Supply-Chain Council, 2011; Huan et al., 2004; Lockamy III and McCormack, 2004). For each area of the protocol we considered aspects related both to environmental and social sides, to achieve the most complete overview on the state-of-the-art of sustainability adoption within fashion companies. To enhance the reliability of data collected, for every company, we interviewed multiple respondents. Our informants were: Compliance and Sustainability Managers, Chiefs of

Sustainability programs, Industrial Directors, Industrial planners, Quality Assurance Managers, and Energy Managers. To further triangulate data collected, in each company we analysed sustainability and code of conduct reports and other green and CSR documents. Besides, multiple investigators were also used in all the interviews (Eisenhardt, 1989) and all the sessions were recorded and transcribed after the interview.

Findings from the case studies

In this section we will present main results highlighted by the interviews with our analyzed companies.

Alpha Company

Alpha is an international Italian fashion house which designs, manufactures, distributes and retails leather goods, shoes, watches, jewellery, accessories, eyewear, cosmetics and home interior. The company markets these products with a retail network based upon more than 2,000 shops in different countries. With more than 5,000 employees the group is one of the biggest in the Italian fashion industry.

Sustainability Governance. Alpha is basically a product-oriented company and for this reason sustainability has to support both designers and production stages. There is a department that deals with sustainability issues and takes care that the requests from the designers are satisfied in compliance with social and environmental standards. Alpha has developed a strategy that is traced upon three key points: 1) Control the upstream supply chain (both first and second tier suppliers); 2) make the product 100% compliant with regulations so that it can be considered "sustainable"; 3) Initiate and sustain R&D projects, LCA projects, international partnerships, special projects etc.

Drivers and barriers. Internal drivers towards the sustainability can be identified in the willingness and the moral code of Alpha. As an external driver, instead, we can recognize the NGOs adverse campaigns as the main push for the company to align with more severe environmental programs. Moreover, Alpha had to deal with some problems that came up with the export: the reason is that different countries have different laws and regulations, and some stricter rules concerning the accepted percentage of chemical substances in the clothes sometimes blocked the trade. Barriers to sustainability are essentially the high costs related with the adaptation to environmental and social standards and the top priority given by designers to style and creativity, which does not accept any constraint, not even regarding sustainability. The operations must find a sustainable way to produce what the designers have created, not vice versa.

Practices. Alpha aims at achieving sustainability in two different ways: process safety control and supply chain control. Starting from the former, the goal is to produce respecting the strictest environmental standards, so the first thing Alpha asks to his suppliers is to subscribe a contract where they specify the threshold of chemical substances for each item. The following step is a chemical test: third-party laboratories must ascertain that suppliers' products are in compliance with the most restrictive international standards. After that, testing results and costs are gathered up in a database. Alpha makes around 8,000 tests every year, for a total amount of € 2 million spent. The goal of supply chain control, instead, is to work only with those suppliers who respect the commitment required by Alpha. For every suppliers, there is a set of controls that are taken: (i) self assessment tool to all first- and second-tier suppliers to collect data about social aspects, environment and healthy & safety; (ii) quality audits through sustainability checklists used by quality auditors who visit suppliers to control the quality of products and raw materials; (iii) sustainability audits which consist of a

more structured and articulated checklist used to evaluate working conditions at suppliers' sites; (iv) corrective active plan to manage non-conformities. Then, once that a supplier is recognized to have some sustainability non-conformance, Alpha company works together with it to resolve the issues.

Beta Company

Beta is an international company that produces and distributes sunglasses and eyeglasses with high technical and stylistic quality. The company has approximately 70,000 employees all over the world and its worldwide retail network consists of 7,500 stores (owned) and various wholesale outlets (private optical centres); Beta's value chain is vertically integrated up- and downstream.

Sustainability Governance. Beta invests in social and environmental sustainability through three departments. The first is in charge of meeting environmental goals (i.e. the adoption of green solutions across all the manufacturing processes). The second department is in charge of the social sustainability of all employees of the company and its suppliers and distributors. The third department is a foundation of social nature that provides raise funding and collection of used frames and eye-glasses for the needy people. The sustainability strategy adopted by Beta is based upon the integration between the top-down (which defines the strategic guidelines and plans at the corporate level) and bottom-up approaches (i.e. staff involvement and incremental improvement). Within the former the company has employed dedicated professionals with specific responsibility's roles that, together with the top management team, best defines the objectives. The bottom-up approach, instead, offers the opportunity to all the employees to propose the adoption of eco-friendly and social advices. These proposals are collected at every level of the organization by members of Beta, which, on voluntarily basis, have the task of engaging people and spread the sustainability culture within their Departments. The end goal is to endorse orientation towards sustainability within company's values.

Drivers and Barriers. Sustainability projects go beyond what is prescribed by the law. It means that the tension towards sustainability is mainly driven by internal drivers: surprisingly the company does not feel any pressures by NGOs. Main barriers to the adoption of green and social requirements are the time required for the implementation of different solutions. Since Beta competes within the fashion industry, times to market are very compressed and short, and so adoption of certain solutions is avoided because it could lengthen lead times. Moreover, not all the components can be easily modified since customers could not appreciate some new just-introduced materials.

Practices. The company achieved ISO 14000, ISO 50000 and ISO 18000 certifications. Beta is also starting to address Life Cycle Assessment (LCA) and the Environmental Product Declaration (EPD), together with Product Category Rules (PCR) certification.

The company is strongly working on CO2 emission side too. Much is done through the procurement of energy generated by renewable sources and through the development of a complex CO2 measurement system at the manufacturing level. As for emissions and chemicals, Beta is working with thresholds that are much more stricter than regulation's ones. On the delivery side, there are on-going collaborations with some providers of logistics services to minimize CO2 emissions per shipped piece (e.g. use of less polluting vehicles, optimization of tracks, etc.). Suppliers' sustainability behavior (up to first tiers) is controlled by a checklist that is split in three parts: environment, labour, social. Besides, annual audits are held to verify that all suppliers are compliant. On the whole, there is an annual budget that can be spent on preliminary studies on sustainability and whose results could be of interest of the whole group (i.e.

LCA studies, etc.). However, when a project is confirmed, its related implementation costs are supported by the specific functions that receive direct benefits. From a return logistic perspective, the company has already settled a return policy for the unsold products from retail stores, which may come back to serve secondary markets. Finally, interestingly enough, up do date the company is not communicating any of its environmental results externally, to avoid green marketing attacks. Only the social foundation strongly communicates its engagement because its fund-raising purpose.

Gamma Company

Gamma is an Italian fashion company, part of a multinational group, which designs, manufactures, distributes and retails a wide range of products as small leather goods, accessories, apparel, footwear, jewellery, eyewear, watches, perfumes, and house interior, for man, woman and kids. The company has in Italy more than 500 employees and has an international retail network distributed worldwide.

Sustainability Governance. Gamma is mainly a product–oriented company. Firm's strategy can be summarized in offering unique products, in limited series, to perfectly meet customer demand and expectation. At the same time, sustainability issues represent an important part of the company mission. Since three years an Ethic Code, covering both social than environmental aspects, has been approved within the company and diffused among 1-tiers and 2-tiers suppliers. Even if there is not a function dedicated to sustainability, the development and the application of the Ethic Code is demanded to each department. Most of the content and the approach of the Ethic Code is related and compliant with the SA8000 certification, while aspects related to product sustainability (e.g. sustain R&D projects, LCA projects) are considered not important as the quality of raw materials and final items. Data regarding process sustainability (i.e. environmental emission, waste, water and energy consumption) are collected because of the strategy of the international group, which the company belongs to.

Drivers and barriers. Most of the drivers of Gamma have to be considered internal, because the company declares to not receiving any external NGO's pressure to improve the sustainability of products or processes. A main driver towards sustainability is represented by the compliance with the legislation, mainly due to the marketability of their products in different countries around the world, especially for kids' products. In this view, Gamma's policy to comply with chemical and environmental regulation is to align with the most stringent worldwide laws. Barriers to sustainability are essentially represented by the absence of customer expectations and the dominant priorities deployed by designers to style, creativity and product quality, which have to be achieved before considering the sustainability. At the same time, even suppliers, which are mainly chosen because of quality, can represent a barrier, when benefits in adopting sustainability practices are not correctly transferred to up-stream supply chain actors.

Practices. The company developed an Ethic Code compliant with the SA 8000 certification, even if it is not interested in being certificated. Therefore, the implementation and diffusion of social and ethic practices can be considered a company's continuous voluntary process applied both internally and to 1-tiers and 2-tiers suppliers.

Regarding raw material controls, there are not specific tests on environmental aspects, even if a special attention is dedicated to the ones used for kids collections. This is mainly due to normative rules rather than environmental practices. Suppliers of raw materials, however, are not only required to be compliant with the current normative, but also to subscribe the Ethic Code. Even if in a non-structured way, the company can conduct an audit on its raw material suppliers to verify the application of

the Ethic Code. The subscription of the Ethic Code is requested to all the 1-tiers suppliers, but it is planned to extend it to the 2-tiers suppliers too.
Regarding CO2 consumption and reduction, the company follows the practices implemented by the multinational group, which it belongs to. All these activities are carried out by external consultants, guided by the holding company.

Discussion and Conclusions

Case studies analyses showed that main drivers toward environmental and social sustainability principally go back to both internal and external aims. The former originate and are nurtured by company's willingness, cultural and organizational values and leadership on the issue. The later depend on the pressures by NGOs and laws and regulations that are forcing fashion companies to be compliant and sensible to the sustainability issues. However, what has emerged from our on-field analysis is that all the companies experienced an initial difficulty to deal with the strategic change toward sustainability. In all the cases, companies had to invest many efforts to overcome this early negative momentum and achieve a high-expected level of standards either for internal improvement but also to avoid any NGOs' marketing attacks.

Irrespectively of the nature of the drivers, to purse and undertake the sustainability goals within their Operations and Supply chains, fashion companies implement a set of several practices and certifications, In doing this some companies rely on dedicated Departments, while another delegates the achievement of social and green goals to every single functions/department, inspired and supported by the high commitment of the president of the organization.

Main findings emerged by case study analysis are listed and compared in the table 1.

Table 1 - Main findings from cases

	Alpha Company	***Beta Company***	***Gamma Company***
Sustainability Governance	Top-down approach	Top-down approach + Bottom-up approach	Top-down approach
Drivers	- *Internal*: Moral code - *External*: NGOs	Mainly internal (no NGOs pressures)	Only Internal
Barriers	- High costs of green solutions - Priority given to style		- No external input - High costs - Priority given to quality
NPD	Designers leads on sustainability	Sustainability has an important role in the design	Designers leads on sustainability
Source	Controls at 1st and 2nd tier suppliers	Controls only at first tier suppliers	Controls at 1st and partially 2nd tier suppliers
Make	Company's Productive thresholds are stricter than regulation's ones	Company's Productive thresholds are stricter than regulation's ones	Company's Productive thresholds are stricter than regulation's ones
Deliver		Collaborations with logistics providers	Collaborations with logistics providers
Retail	Non yet considered	Many environmental initiatives (i.e. LED lighting)	Non yet considered

Return	Non yet considered	Performed in some countries	Non yet considered
Budgeting	Sustainability Department takes care of the sustainability expenses	Every Department takes care of the related sustainability expenses	
Communication	No external communication to avoid green attacks	No communication to avoid green attacks	No communication to avoid green attacks
Main adopted practices	LCA, Ethic Code	ISO14000, ISO50000, LCA, EPD, PCR, ISO 18000, Ethic Code	LCA, Ethic Code

In conclusion, fashion companies are increasingly enhancing their attentions toward the environmental and social sustainability issues (Guercini and Ranfagni, 2013). However, changing the traditional economical business model to the "triple bottom line" (Elkington, 1997) one is not an easy step and can't occur overnight. Fashion companies are not yet fully aware of this change, and lack of industry guidelines or consolidated frameworks to follow this journey does not help companies in re-organizing their goal and activities within their supply chains.

Hinging upon this lack of consciousness and knowledge concerning tools and best practices to enrol environmental and social issue in the fashion industry, we conducted three case studies in three important Italian players. Our findings show that main drivers to engage sustainability practices are both internal and external. So far, it seems fashion companies are mainly trying to improve their up-stream supply chain side. Companies are investing significant efforts to ensure that their suppliers are firstly in compliance with regulations and then that are able to achieve stricter thresholds than those the laws require. Companies are also investing a lot of efforts internally, through the adoption of energy savings arrangements and a particular attention toward CO2 emissions.

Our work contribute to the on-going debate on sustainability by deepening the topic in the fashion industry, which is now under high pressures to align itself to these new social and green needs. Moreover, we offer to practitioners an overview about the state-of-the art in the adoption of sustainability practices by some leading fashion firms.

The designing of the research gives sufficient validity in the results. However, only three cases in one industry limit the generalizability of the results. In the future steps of this research, we will increase the number of studied fashion companies. A longitudinal approach could also be adopted to better examine the causal relationships among practices and sustainability performance.

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