"GREEN PRODUCT": WHERE WE ARE AND WHERE TO GO?

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Abstract

Nowadays interest in corporate environmental strategies has shifted from cleaner processes to green products. The relevant literature of "Porter Hypothesis", argues firms have the opportunity to pioneer through green products' innovation, allowing them to differentiate and thus gain competitive advantage. On the other hand, products' environmental burden during entire lifecycle is undeniable. Yet, bearing in mind the weakness of previous work to adequately address a commonly accepted green product definition, as well as the inconclusive academic empirical results on firms' competitiveness, many cases of corporations' green-washing behaviour come as no surprise.

In this exploratory paper we proceed with an exhaustive literature review, aiming to fill the gap of terminology absence. We develop an integrative concept that regards green product from "cradle to grave" and provides a combinatory framework for defining and evaluating the degree to which a product / procedure contributes to social and environmental sustainability.

Keywords: green products and procedures, social and environmental sustainability
JEL Classification: Q56

1. Introduction

Nowadays multidimensional crisis calls for simultaneous economic stability, social equity and environmental protection pushing firms to actively engage and complete their "corporate social responsibility". Dynamic relationship between firms and environment has undergone progressive change (De Bakker et al., 2002). In the 1960s and 1970s, environmental problems were basically neglected from firms, while in the 1980s biophysical environment – seen as an externality and thus additional cost – led some businesses to simple compliance with end-of-pipe technologies. Until then, the majority of US-products did not incorporate environmentally friendly characteristics with the exception of organic foods in the food industry (Air Quality

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Sciences, 2010). After the publication of Brundtland Report in 1987 with the alongside emergence of "sustainable development" terminology, the 1990s were marked by the revolutionary approach of „Porter Hypothesis" (De Bakker et al., 2002; Berry & Randinelli, 1998). According to Porter and van der Linde (1995), environmental innovation as response to ecological challenges may offer multiple competitive opportunities that stem from differentiate and/ or cost strategies, in a win-win logic.

Since then, "green" became a hot topic in academia and there has been a growing number of references regarding terms such as "green products", "green strategies", "green labeling" and so on (Air Quality Sciences, 2010). The problem is that every term including the notion "green"/"environmental" seems to totter and be quite complex. So, the correct definition should be the starting point. That is the reason why we turn to the very basics: what is finally a "green product"?

Main objective of this work is to identify works on the field of "green product" definition and thereafter to see the progress that has been made in theoretical as well as empirical studies concerning the relationship "green vs. competitiveness" in the last years. The exhaustive literature review seems to be the necessary methodological approach helping to the conceptual content of the field and guiding us towards proper theory development, in an attempt to establish a functional term in order to fill the existing gap.

The rest of the paper is structured as follows: next section presents the environmental management literature review, in which we see the transition from "green processes" to "green products". Section 3 provides the theoretical background of the field, in order to help us define clearly the concept "green product" through relevant terminology. In the forth section we explore the debate on the empirical studies concerning "green vs. competitive". Last but not least, section 5 summarizes this study and provides conclusions and proposals for further research.

2. Environmental management

The emergence of environmental management that cares for coordinating organizations with environment, arose in order to minimize the ongoing and conspicuous environmental degradation, caused by the prolonged industrial production and is traced in the 1990s (Chen, 2008; Lee, 2009). It became quite fashionable since the new millennium and concepts such as "green management", "green innovation", "environmental strategies" have come to the forefront and have been widely researched (Chen, 2008; Orsato, 2006). Although there is no common

classification among the forces that motivated businesses' sensitiveness and led to the acquaintance of environmental management, two of them seem to be mainly addressed in the literature: the stringency of environmental legitimacy, which took place in international and national scale and the rise of consumerism (Wong, 2012).

Firstly taken strategies of corporate environmental management have started to go beyond regulatory compliance – an approach that flourished since 1960s – as the continuous emergence and adjustment of environmental laws led to increased costs (Ross & Evans, 2002; Tien et al., 2005). At that time the existing corporate environmental management focused on reactive strategies. Later on, the shift that took place was from end-of-pipe pollution control technologies (e.g. filters) to corporate environmental management of environmental proactivity (Charter et al., 2001).

These proactive strategies are distinguished in organizational and operational/ functional, with the later to further divide in process oriented and product oriented strategies (González Benito & González Benito, 2006). At first, the focus was on cleaner production processes, aiming at reduction of impacts through a more environmentally conscious production process (González Benito & González Benito, 2006; Frondel et al., 2007).

The progressive change that followed, next to cleaning production technologies and pollution prevention, caused the environmental management to entail forms of product stewardship (De Bakker et al., 2002). Over the last decades, corporations' shift towards proactive environmental protection strategies shifted from processes to products due to stringent environmental regulations that aim at minimizing the ecological footprint of products since there has been the understanding that products can create an environmental burden during their whole lifecycle, from production to consumption and finally to disposal (Albino et al., 2009; Boons 2002; Triebswetter & Wackerbauer, 2008). According to Wong (2012), the "green product" innovation seemed to be more influential than "green process" innovation. Moreover, there are major markets for eco-products that require businesses' full compliance (Wong, 2012).

Nowadays, it has been perfectly clear that economic growth should be accompanied by minimization of ecological degradation as well as attention to social problems. Thus, an increasing number of companies are working on the development of environmentally friendly products that will function as a differentiation tool, aiming at competitiveness (Chen, 2013). Consequently, concepts such as integrated environmental management (Margerum, 1999), integrated product policy (Commission of the European Communities, 2001), product-oriented

environmental management (De Bakker et al. 2002), environmental design (Tien et al., 2005), green supply-chain management (Shrivastava, 2007), green product design (Chan, 2011), green product development (Jasti et al., 2015), design for the environment (Us term)/eco-design (European term)/environmental conscious design (Bauman et al., 2002; Van Weenen, 1995; Tukker et al., 2015), green product innovation (Wong, 2012) and product stewardship (De Bakker et al., 2002) have come to the forefront and are researched in academia, while at the same time have led to the development of new methodologies for the evaluation of environmental impacts such as Life Cycle Analysis, Strategic Environmental Assessment, Environmental Management Systems and many more (Albino et al., 2009; Bauman et al., 2002; De Bakker et al. 2002; Finnveden et al. 2009).

3. What means a "green product"

Although "green" caught the attention of nowadays political speech (that seeks for the new paradigm of "green growth") and has become mainstream in hitherto literature review, there exists a definitional issue since research in the field is underdeveloped and the concept of what really constitutes a "green product" still remains unclear (Durif et al., 2010; Hartmann & Ibáñez, 2006). That was as well empirically confirmed by Durif et al. (2010), who studied the concept of "green product" in a 30-year old period from three different viewpoints: academia, businesses and consumers. Durif et al., (2010) concluded that the concepts neither match nor even converge. The concept of "green" is characterized as *evocative and powerful* since consumers and companies seem to be attracted to this differentiator (Air Quality Sciences, 2010). No wonder why the problem regarding the terminology absence seems to be mostly addressed in the marketing and management field (Chen et al., 2006; Russo & Fouts, 1997).

There is no unified definition, thus "green products" are interpreted in different ways. The most prominent notions used in the literature are 'green', 'eco', 'environmental' and 'sustainable'. Albino et al. (2009) argues that "green" and "eco" in terminology are used interchangeably, but the term "sustainability" shows a broadening in scope, taking into consideration the so-called "3 pillars" of sustainable development: economic vitality, environment and social fair, that are also commonly referred as triple bottom line. According to Yanarella et al. (2009), "green" is a much easier and convenient term to follow, since sustainability calls for radical changes in our growth model. Maybe that justifies the rise in the use of the term "green" in recent years.

The term also seems to depend every time on the field of research (Durif et al., 2010; Saha & Darnton, 2005). For instance, there exists a terminology gap between business management and environmentalists (Chen, 1991; Jasti et al., 2015). At the same time, there is no terminology convergence even in economic sectors. For example, a "green product" in health sector might be a product that minimizes the damage in human health whereas in manufacturing business, it should combine economic and environmental protection (Saha & Darnton, 2005).

Moreover the concept itself, which is under research, is never the same thus we have a plethora of concepts. In prior literature, concepts such as green products (Albino et al., 2009, Chen, 1991; Durif et al., 2009), green product innovation (Chen et al., 2006; Kam, 2012; Wahid & Lee, 2011), eco-products (Karlsson, 2006), environmental innovation (Costantini & Mazzanti, 2012), and eco-innovation (Rennings, 2000) were addressed. Finally, concepts aim at different elements such us environmental impacts (Albino et al., 2009), parts of life cycle analysis (Pickett-Baker & Ozaki, 2008), green core competence (Chen, 2007).

The absence of a universal definition of the term and the ongoing debate of what really constitutes a "green product" has led to a twofold problem. At first, there is a methodological deficiency in academic research because the term is quite ambiguous, which is considered as the main reason to conflicting empirical results (López-Gamero et al., 2009). In praxis, on the other hand, the industrial sector and third party authorities have long started to communicate their "greenness" in the market, mainly by establishing standards for "green products" (e.g. eco-labeling) and personal declarations that come through their environmental policy reporting, thus they are in several cases dealt with skepticism and accused of "greenwashing" their products (Albino et al., 2009; Durif et al., 2010). It is remarkable that 32% of the so called "green products" are fake, according to the 2010 TerraChoice Report, which saw a 6% rise in comparison to 2009 (Air Quality Sciences, 2010). The rise of a properly developed term will solve the above problem and at the same time will lead to proper environmental strategies.

From a conceptual point of view, despite the terminology variation, there seems at least to be a convergence that "green product" should take into consideration the environment and that there must be a life cycle thinking, since environmental impacts are generated at each stage of product life cycle (Air Quality Sciences, 2010; Chen, 1991; Wong, 2012). That was apparent from the early 1990s because every product causes multiple ecological impacts on extraction of raw materials, energy use, air and water consumption, production of intermediate and end

products (in general "green" manufacturing, which if further divided in end-of-pipe and integrated/ clean technologies), distribution, consumption (products generate private environmental benefits for the consumer such cost and energy savings, toxic free), recycling and finally disposal (Chan, 2011; Frondel et al., 2007; Wahid & Lee, 2011). Thus, bearing in mind the product lifecycle management, the same classification was applied to "green products", leading to the development of Environmental Life Cycle Analysis as a tool in order to measure the ecological impact of products' (Finnveden et al., 2009).

Although "green product" definition is not frequently found in the literature, an early relatively proper concept is Ottman's (1998, p.89), according to which: "Green products are typically durable, non toxic, made of recycled materials, or minimally packaged. Of course, there are no completely green products, for they all use up energy and resources and create by-products and emissions during their manufacture, transport to warehouses and stores, usage, and eventual disposal. So green is relative, describing products with less impact on the environment than their alternatives". The term of course falls short because it does not incorporate the intangible (services) together with the tangible (physical) which would represent a significant increase in scope and is too long. On the other hand, the OECD (1998) term according to which "environmental goods and services include all activities that measure, prevent, limit, minimize or correct environmental damage" does not refer to products effect from "cradle to grave" (Fankhauser et al., 2013).

The right definition should interpret the boundaries of the concept clearly so that it will constitute the foundation for valid inferences. The main goal is the contribution to the conceptual understanding by harmonizing the different terms to a general that could be implemented in all fields. Thus the term must be short but at the same time exhaustive and inclusive. Thus the following laconic concept could be proposed: green is a product/service that minimizes its environmental impact during its whole life-cycle.

4. Green and competitiveness

Firms in global scale are continuously trying to develop innovative ways to enhance their competitiveness in 21st century and be led to a win-win situation. The empirical confirmation is thus of utmost importance.

Firstly it was the impact of the constantly changing environmental regulations on firms that gave rise to many academic debates since early 1990s (Ambec & Barla, 2006). During these

last 25 years, academia has witnessed a transition in empirical investigation to more complex and specific empirical researches, from case study analysis to micro and macro frameworks, from examining effects of end-of-pipe technologies to the effects of proactive ones (Costantini & Mazzanti, 2012; Frondel et al., 2007). But hitherto empirical investigation still varies in studies that depict positive relationship between environmental variables and firms' competitiveness and in those that show negative or no relationship (Eiadat et al., 2008; Iraldo et al., 2011).

Since there is not a universal term of what constitutes a "green product" with no solid theoretical core, mixed empirical results come as no wonder. The reasons for this debate have not been yet exhaustively examined (Horváthová, 2010). There exists a long list of environmental as well as economic variables that have been used (López-Gamero et al., 2009). According to Horváthová's (2010) meta-analysis investigation, the problem seems to merely focus on the environmental variables. At the same time there is a plethora of parameters (such as firm size) and techniques that might influence the results (with multiple regression and panel data techniques to be more objective) (Horváthová, 2010; Iraldo et al., 2011).

5. Conclusion and further research

Concluding, there has been a shift in corporations' interest to "green products" over the years. Hitherto literature review though still seems to be inconclusive in theoretical investigation. Despite the development on the field, there exists a terminology gap maybe due to the fact that the field is considered relatively new. Our effort was to contribute to this discussion by providing a laconic yet inclusive term in order to fulfill this gap in literature. Finally, there is an ongoing debate in empirical investigation as well.

Last but not least, on a further research there should be a list of the environmental and economic variables as well as of the techniques that have been used in past researches in order to find the most suitable and objective ones and then move to a thorough empirical investigation to examine the relationship "green vs. competitive". That would be of course quite challenging, since the majority seems to be based in questionnaire surveys (Chen et al., 2006; Triebswetter & Wackerbauer, 2008) and would require suitable data. Lastly, since the majority of empirical examination focuses on the US economy (Darnall et al., 2008) it would be of great interest to focus on European Union.

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