



Impact of Environmental Management on Competitive Advantage of Tunisian Companies: The Mediator Role of Organizational Culture

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ABSTRACT

In recent decades, companies have incorporated the environmental concerns in their strategic and operational activities. Despite previous literature, the debate about the competitive benefits of environmental practices is still open. This paper examines the role of organizational culture in the contribution of environmental management to competitive advantage. Data collected from 108 Tunisian companies were analyzed using structural equation modeling. The findings reveal that environmental management has a positive impact on competitive advantage regarding costs and differentiation. Moreover, environmental management has a positive effect on organizational culture which contributes to costs and differentiation competitive advantages.

Keywords: Environmental Management, Competitive Advantage, Organizational Culture, Resource-based View

JEL Classification: M140

1. INTRODUCTION

Since its introduction in 1987, sustainable development has become a central theme of the most important political and economic events. More specifically, environmental concerns have dominated the economic and social dimensions of this concept. International conferences have been multiplied to sensitize about critical environmental problems such as the global warming. Moreover, consumers are increasingly aware of their ecological role by purchasing green products. However, industrial companies still damage the natural environment without worrying about the irreversible effects of their activities. In recent years, they began to integrate environment activities into their management systems. Currently, managers no longer perceive the natural environment as a constraint but as an economic opportunity which can enhance their profitability. Indeed, ethical, competitive and relational motivations explain the environmental transformation of companies (Gonzales-Benito and Gonzales-Benito, 2005).

Recently, researchers were interested in the benefits of green practices, particularly in terms of financial performance. Song et al. (2017)

found that environmental management influences future profitability, but it does not contribute to the current financial performance. Few empirical studies have explored the link between environmental management and competitive advantage (Lopez-Gamero et al., 2010; Molina-Azorin et al., 2009; Molina-Azorin et al., 2015; Sharma and Vredenburg, 1998). Qualitative and quantitative methods have been used to analyze this relationship (Molina-Azorin et al., 2015) which revealed conflicting results.

Most of previous works have focused on studying the direct relationship between environmental management and competitive advantage without a more in-depth analysis. Some of them have used the resource-based view as a theoretical framework (e.g., Sharma and Vredenburg, 1998). In addition, organizational culture, which produces some competitive benefits, is one of the main intangible resources examined by the resource-based view. Therefore, we will explore the role of this strategic resource in the contribution of environmental management to competitive advantage. Based on this analysis, this research provides answers to the following questions:

- Does environmental management contribute to competitive advantage in terms of costs and differentiation?

- Does environmental management improve organizational culture?
- What is the role of organizational culture in the impact of environmental management on competitive advantage?

The review of previous research reveals some limits in studying the benefits of environmental practices in terms of competitive advantage. First, the literature has mainly explored the direct relationship between these two variables without analyzing the crucial role of some strategic resources. This research examines the mediator role of organizational culture in the competitiveness generated by environmental practices. Second, this paper takes into account the two competitive advantage dimensions: Costs and differentiation. Third, most of previous studies have been conducted in developed countries. Thus, this study has been carried out in Tunisia as a developing country.

This paper is structured as follows. Firstly, we will examine the basic research concepts and design a theoretical model that meets the research goals. Then, this study describes the empirical investigation to verify theoretical hypotheses. At the end, discussion and conclusion were presented.

2. THEORETICAL FRAMEWORK

2.1. Environmental Management

Although the environment includes everything outside the system, it takes its origin from natural sciences, specifically from ecology (Fürst and Oberhofer, 2011). The importance of ecological problems is due to their visibility (Yang et al., 2010). For several decades, “business” and “environment” are perceived as antagonistic terms (Claver et al., 2007). The public sensitivity to the impact of industrial activities is amplified by global environmental problems (Aragon-Correa et al., 2008) that can only be solved through collaboration on a global scale (Sueyoshi and Goto, 2009).

Environmental management has become a very important business topic, particularly in recent years (Fürst and Oberhofer, 2011). Stakeholders show interest in environmental management mainly in developed countries (Iwata and Okada, 2011). The popularity of this concept has grown through the development of international environmental standards and voluntary programs (Montabon et al., 2007). According to Cramer (1998, p. 162), environmental management can be defined as “technical and organizational activities aimed at reducing the environmental impact caused by a company’s business operations.” For Yang et al. (2011, p. 252), environmental management practices consist of “programs to improve environmental performance of processes and products in the forms of eco-design (e.g., design for environment), recycling, waste management and life-cycle analysis.” In summary, environmental management can reduce negative effects on the environment primarily through the development of products and processes (Jabbour et al., 2010).

2.2. Organizational Culture

In recent decades, organizational culture has enjoyed a great popularity (Van Der Berg and Wilderom, 2004). Barney (1986,

p. 657) has defined culture as “a complex set of values, beliefs, assumptions and symbols that define the way in which a firm conducts its business.” For Hofstede et al. (1990), there are three levels of culture: Organizational culture, occupational culture and national culture. Organizational culture is based on standards and practices learned in the workplace and valid within the organization. Occupational culture contains the values and practices learned between childhood and adulthood in educational and vocational training. Finally, national culture is based on the values learned within the family since childhood. For this author, national cultural differences are in values, while organizational cultural differences are mostly in practices.

Denison and Mishra (1995) identified four traits of organizational culture: Involvement, consistency, adaptability, and mission. They distinguish between two continuums to identify these traits: “Change and flexibility” to “stability and direction”; “internal integration” to “external orientation.” Involvement creates a sense of ownership and responsibility. Consistency is an internal control system that facilitates integration and coordination. Adaptability refers to the norms and beliefs that support the ability to receive and interpret signals from the environment. Finally, mission includes economic and non-economic objectives.

2.3. Competitive Advantage

The competitive advantage is the main area of the strategic management literature (Fahy, 2000; Wiggins and Rufeli, 2002) and the primary interest of the resource-based view (Fahy, 2000; Hansen et al., 2004). It had grown significantly with the Harvard Business School through the Porter’s works (1979; 1980; 1985).

Competitive advantage is the result of a value creating strategy that is not carried out by current and potential competitors (Barney, 1991). It is a relative concept (Hu, 1995; Kay, 1993) and cannot be owned by a single firm (Fahy, 2000). Indeed, a firm may have a competitive advantage over a competitor, a group of competitors, a strategic group or all firms in the industry (Kay, 1993). More specifically, Firm A may have a competitive advantage over firm B which may have a competitive advantage over Firm C (Kay, 1993). Several researchers have explored the sources of competitive advantage. Porter (1985) distinguishes between competitive advantage based on costs and competitive advantage based on differentiation.

A competitive advantage is sustainable if it is able to resist to the competition (Barney, 1991). The sustainability of competitive advantage is achieved if competitors are unable to duplicate the positive consequences of a strategy (Barney, 1991). Neither time nor duration determines sustainable competitive advantage, but it is the inability of rivals to achieve the same benefits (Barney, 1991).

3. HYPOTHESES DEVELOPMENT

3.1. Environmental Management and Competitive Advantage

Despite their relatively small number, research works addressing the relationship between environmental practices and competitive advantage are in continuous progression (Chen, 2008). At the

beginning of this century, leaders began to recognize the benefits of sustainable practices in terms of competitive advantage (Rosen, 2001). Obtaining a competitive advantage is among firms' motivations of manufacturing products oriented toward environmental management (De Bakker et al., 2002). Indeed, environmental practices allow companies to differentiate themselves by their products (Molina-Azorin et al., 2009; Pereira-Moliner et al., 2012; Tari et al., 2010). Specifically, environmental standards stimulate product innovation, which in turn contributes to competitive advantage (Nishitani and Itoh, 2016).

Based on the data collected from 208 Spanish firms, Lopez-Gamero et al. (2010) demonstrated that environmental management contributes to competitive advantage in terms of cost and differentiation. Using an empirical study on 124 Taiwanese firms in several industries, Chiou et al. (2011) showed that environmental performance improves competitive advantage. Knudsen and Madsen (2001) concluded that the surveyed companies consider that environmental commitment stimulates a long term competitive advantage. Recently, Molina-Azorin et al. (2015) have conducted an empirical study on Spanish hotels. The Results, derived from qualitative and quantitative methods, showed that environmental management has a positive impact on competitive advantage in terms of costs and differentiation. Competitive advantage can be achieved by several environmental practices such as eco-design (Tien et al., 2005), taking into account environmental demands and cooperation with customers in ecological topics (Junquera et al., 2012). From the above, we can propose the following hypotheses:

H₁: Environmental management is positively related to competitive advantage based on costs.

H₂: Environmental management is positively related to competitive advantage based on differentiation.

3.2. Environmental Management and Organizational Culture

For Canel-Depitre (1997), the integration of environmental considerations by firms creates a strong ecological culture that drives efforts to achieve environmental goals. Through an analysis of previous research, Lynnes and Dredge (2006) confirmed that voluntary environmental initiatives strengthen corporate culture. Indeed, environmental practices enrich corporate culture which is considered as an intangible resource (Mathieu and Soparnot, 2006). In fact, environmental practices reinforce the corporate culture and drive energy around some core values (Canel-Depitre, 1997). Generally, companies use the terms of culture and environmental performance in their corporate policies. For Boiral (1996), environmental protection should be among the core values of employees. For this researcher, "pro-environmental corporate culture" is created by the human aspects of environmental management, such as employee engagement, values change, involvement, and awareness.

Firms characterized by environmental proactivity use the organizational culture of employees to achieve desired environmental outcomes (Berry, 2004). Environmental management fosters a continuous improvement culture

(Molina-Azorin et al., 2015). Among the capabilities generated by environmental management, Claver et al. (2007) have identified corporate culture oriented toward environmental leadership. In addition, corporate culture is reinforced by environmental actions in production, research and development, and communication (Reynaud and Chandon, 1998). From the above, we can propose the following hypothesis:

H₃: Environmental management is positively related to organizational culture.

3.3. Organizational Culture and Competitive Advantage

The corporate culture plays a crucial role in the success or failure of organizations (Flamholtz and Randle, 2012). Organizational culture is one of the essential characteristics of excellent companies (Peters and Waterman, 1982) that stimulates innovation (Naranjo-Valencia et al., 2016). Based on the resource-based view, culture is seen as a key resource for achieving operational excellence (Gagnon, 1999) and creating competitive advantage (Barney, 1986; Clulow et al., 2003; Fahy, 2000; Fiol, 1991; Martin De Castro et al., 2006). Managers should pay attention to the most important cultural values in their organizations, which affect total quality management practices and performance (Valmohammadi and Roshanzamir, 2015).

Indeed, culture is a strategic resource related to competitive advantage (Fahy, 2000). Organizational culture is seen as a strategic resource because it is valuable, rare and imperfectly imitable (Barney, 1986; Michalisin et al., 1997). In addition, this resource is inimitable due to its unique historical conditions or path dependence, social complexity and causal ambiguity (Dierickx and Cool, 1989). The difficulty of describing values, symbols and beliefs makes organizational culture inimitable (Martin De Castro et al., 2006). Through a theoretical analysis, Martin De Castro et al. (2006) have confirmed that organizational culture is irreplaceable, inimitable, easily transferable and valuable. These characteristics assert this resource as a source of sustainable competitive advantage. Based on an empirical study, Hall (1992) showed that organizational culture is the fourth important intangible resource in terms of creating sustainable competitive advantage. From the above, we can propose the following hypotheses.

H₄: Organizational culture is positively related to competitive advantage based on costs.

H₅: Organizational culture is positively related to competitive advantage based on differentiation.

In conclusion, we obtained a research model (Figure 1) based on the theoretical hypotheses.

4. METHODOLOGY

4.1. Sample

During recent years, Tunisia has been making a significant progress to protect natural environment. We conducted a survey on a sample of Tunisian firms certified or preparing certification according to ISO 14001, and other firms recommended by experts

in environmental management. Data were collected from 108 Tunisian companies which belong to several sectors. The sample consists mainly of SMEs (50-250 employees). We present in Table 1 the main characteristics of our sample.

4.2. Measures

A variety of measurement scales were selected for this study. To measure environmental management, we adopted the scale developed by Gonzales-Benito and Gonzales-Benito (2005). It contains four dimensions: “Planning and organizational practices,” “process operational practices,” “process operational practices,” and “communicational practices.” We have selected the scale developed by Denison and Mishra (1995) to measure organizational culture. It is divided into four cultural dimensions: Involvement, consistency, adaptability, and mission. Several scales were created to measure competitive advantage. We have chosen the scale designed by Cater and Cater (2009) which is divided into two dimensions identified by Porter (1985): “Costs” and “differentiation.”

5. RESULTS

In order to evaluate the psychometric properties, a statistical analysis has been conducted in two stages. The exploratory stage includes principal component analysis (PCA) and internal consistency. The confirmatory stage has been carried out by confirmatory factor analysis (CFA) which confirmed the dimensionality and established the validity and reliability of the measurement scales.

Figure 1: Research model

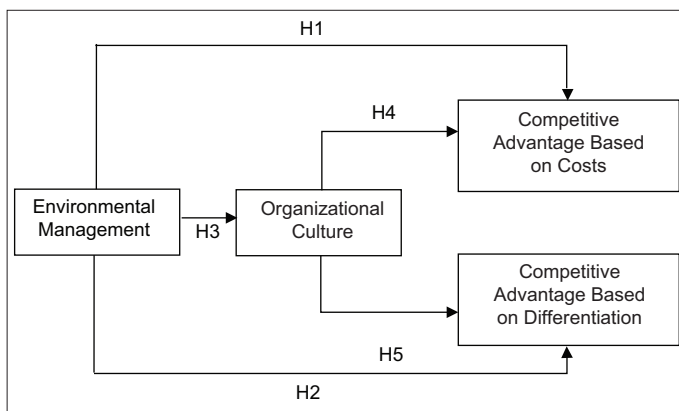


Table 1: Distribution of the sample by firm size and certification ISO 14001

Characteristics	Number (frequency)
Size	
Small enterprises (<50 employees)	21 (19.44)
Medium enterprises (between 50 and 250 employees)	39 (36.11)
Large enterprises (more than 250 employees)	48 (44.45)
Certification ISO 14001	
Certified	65 (60.19)
Preparing certification	25 (23.15)
Others	18 (16.66)
Total	108 (100)

The table 2 shows the main results of the exploratory factor analysis. Firstly, we observed the factorization conditions of the selected scales. Indeed, Bartlett tests are significant and KMO index showed values above 0.5 which validates the data predisposition to factoring. We conducted PCA with a “varimax” rotation. Kaiser and Cattell elbow criteria revealed a five-dimensional structure of environmental management, two-dimensional structure of both organizational culture and competitive advantage. Some items were eliminated due to their lower communalities. All the factor loadings of selected items exceed 0.5. For internal consistency, Cronbach’s alpha is >0.6 for each construct.

As illustrated in Table 4, CFA was performed using Lisrel 8.8 to analyze variables reliability and validity. To assess the goodness fit of indices (GFI), we selected the following indices: Root mean squared error approximation (RMSEA), GFI, adjusted GFI index (AGFI), root mean square residual (RMR), comparative fit index (CFI), incremental fit index (IFI), normed fit index (NFI), non-NFI (NNFI) and normed χ^2 (Table 3). For measurement models, the goodness of fit (GFI) indices is satisfactory. The RMSEA is excellent and above 0.1. The RMR does not exceed the critical threshold of 0.08. The GFI and AGFI are close to 1. Similarly, the CFI, IFI, NFI, and NNFI tend to 1. The normed χ^2 is above 2. The composite reliability is >0.7 for all constructs. The average variance extracted is >0.5 which confirms the convergent validity of measurement models. Moreover, the obtained results show a superiority of the model with free correlations over the model with correlations fixed to 1. Thus, the discriminant validity of variables was confirmed.

Both exploratory and confirmatory stages have validated the psychometric quality of measurement scales. The structural equation modeling has been used to verify the research hypotheses. We adopted the “internal consistency” method proposed by Kisthon and Widaman (1994) to improve the model fit. We tested the research hypotheses using Lisrel 8.8. The GFI indices of the models is satisfactory (H_1 and H_2 : RMSEA = 0.61, GFI = 0.91, AGFI = 0.86; RMR = 0.039, CFI = 0.98, IFI = 0.98, NFI = 0.94, NNFI = 0.98 and normed $\chi^2 = 1.394/H_3$, H_4 and H_5 : RMSEA = 0.44, GFI = 0.90, AGFI = 0.89, RMR = 0.033, CFI = 0.99, IFI = 0.99, NFI = 0.95 and NNFI = 0.99, normed $\chi^2 = 1.209$).

Table 2: Exploratory factor analysis

Factors	Standard loadings	Cronbach’s alpha
Environmental management		
Planning and organization	0.655-0.769	0.878
Product operational practices	0.687-0.840	0.881
Process preventive practices	0.648-0.784	0.897
Process palliative practices	0.703-0.879	0.868
Communicational practices	0.696-0.827	0.708
Organizational culture		
Internal organizational culture	0.758-0.843	0.849
External organizational culture	0.697-0.856	0.856
Competitive advantage		
Competitive advantage based on costs	0.878-0.895	0.903
Competitive advantage based on differentiation	0.776-0.879	0.822

Table 3: Fit statistics for the measurement model

Variables	RMSEA	GFI	AGFI	RMR	CFI	IFI	NFI	NNFI	Normed χ^2
Environmental management	0.052	0.81	0.77	0.053	0.93	0.93	0.81	0.92	1.286
Organizational culture	0.016	0.96	0.92	0.034	0.99	0.99	0.95	0.99	1.027
Competitive advantage	0.090	0.96	0.88	0.023	0.98	0.98	0.96	0.96	1.865

RMSEA: Root mean squared error approximation, AGFI: Adjusted goodness fit of index, RMR: Root mean square residual, CFI: Comparative fit index, IFI: Incremental fit index, NFI: Normed fit index, NNFI: Non-normed fit index

Table 4: Confirmatory factor analysis

Variables	Factors	AVE	Composite reliability
Environmental management	Planning and organization	0.510	0.879
	Product operational practices	0.654	0.883
	Process preventive practices	0.560	0.899
	Process palliative practices	0.712	0.880
	Communicational practices	0.688	0.812
Organizational culture	Internal organizational culture	0.5967	0.8549
	External organizational culture	0.6086	0.8603
Competitive advantage	Competitive advantage based on costs	0.754	0.902
	Competitive advantage based on differentiation	0.616	0.827

CFA: Confirmatory factor analysis

Table 5: Hypotheses results

Hypotheses	Relationships	Loadings	t-test
H ₁	Environmental management - Competitive advantage based on costs	0.66	6.44
H ₂	Environmental management - Competitive advantage based on differentiation	0.66	6.04
H ₃	Environmental management - Organizational culture	0.92	8.66
H ₄	Organizational culture - Competitive advantage based on costs	0.73	7.03
H ₅	Organizational culture - Competitive advantage based on differentiation	0.69	6.29

Indeed, the results show that environmental management positively and significantly influences competitive advantage based on costs and competitive advantage based on differentiation. Moreover, environmental management has a positive and significant impact on organizational culture that is positively and significantly linked to both competitive advantage dimensions. Thus, the conceptual model was validated with all hypotheses (Table 5).

6. DISCUSSION AND CONCLUSION

Our empirical study confirmed the central hypotheses of this research linking environmental management and competitive advantage dimensions. Indeed, Tunisian companies can compete by adopting an environmentally friendly behavior. Green practices and clean technologies minimize energy and raw materials consumption, which in turn contribute to competitive advantage based on costs. Consumers are increasingly sensitive to the environmental impact of products on the natural environment. Therefore, environmentally responsible firms offer green products which create competitive advantage based on differentiation.

We have proposed a hypothesis about the positive link between environmental management and organizational culture. This relationship has been confirmed through our empirical investigation. Indeed, environmental practices promote shared values and beliefs within a company. Berry (2004) stipulated that the processes, procedures and policies related to environmental management reflect the values and beliefs of the company, which strengthens its corporate culture. According to Canel-Depitre (1997), green practices spread a common state of mind, values and

objectives, which promote a better cohesion between the internal actors of an organization.

The integration of environmental dimension requires a cross-functional collaboration within the company. Indeed, all employees work together to achieve shared objectives. Environmental commitment depends not only on the environment function, but also on the cooperation between all departments. All functions and employees should participate in the ecological implications of their companies, which reinforce organizational culture. In addition, environmental communication enhances firm's culture and identity, highlights firm's expertise and values, and strengthens employees' trust and responsibility (Bereni, 2004).

According to the resource-based view, organizational culture is a strategic resource. Our empirical study confirmed the two hypotheses that positively link organizational culture to both competitive advantage dimensions. A strong organizational culture allows companies to differentiate themselves from their competitors. Indeed, shared values and beliefs within an organization minimize waste of resources and duplication of efforts. The beliefs shared by members of the organization promote better collaboration, cohesion in the workplace, involvement of employees and efficiency in time of realization. Organizational culture is a major tool to manage members' behaviors of an organization (Cabrera et al., 2001), control daily operational tasks (Chu, 2003), and facilitate organizational change (Cabrera et al., 2001; Chu, 2003).

Several research studies have been conducted to examine the contribution of environmental practices to competitive advantage.

Considering the limitations of previous research, we explored the role of organizational culture in the impact of environmental management on both competitive advantage dimensions: “Costs” and “differentiation.” Indeed, organizational culture is a strategic intangible resource. Thus, we have studied its role in the positive consequences of environmental actions. Our empirical study has certified the superiority of the “win-win” approach in the Tunisian context. However, this work contains some limitations. Firstly, it does not take into account other factors that can also explain the link between environmental management and competitive advantage. As a result, this article can be enriched by integrating other strategic resources as mediator variables and/or other factors as moderator variables in the theoretical model. The obtained results are specific to the Tunisian economic environment and cannot be generalized to other contexts. Future research can be conducted in a developed country to explore the mediating and moderating roles of other variables on the relationship between environmental management and competitive advantage.

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