



The importance of the complementarity between environmental management systems and environmental innovation capabilities: A firm level approach to environmental and business performance benefits

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ABSTRACT

Using a firm-level approach to environmental innovation and drawing on the notion of firm environmental capabilities' complementarities as the potential advantages derived from the connection between the different environmental practices of the firm, we heed the call of environmental management scholars to analyze environmental management systems' potential moderating and indirect effects. More specifically, this work analyzes the existing complementarity between environmental management systems (EMSs) and environmental innovation capabilities and the effect of this relationship on firm performance.

In order to reach that goal, we test empirically a novel measure of environmental management systems that takes into account not only the certification but also the degree of development of the distinctive elements that are part of these systems. Our results show that environmental management systems positively moderate the relationship between environmental product innovation and firm market performance. The proposed theoretical model is tested on a sample of 157 firms that belong to the Spanish metal production and transformation industry (one of the most polluting) with 100 or more employees.

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1. Introduction

Although there is no doubt that improving environmental performance is one of the primary objectives of environmental management systems (Nawrocka and Parker, 2009), the implementation of these systems is often also related to cost and efficiency improvements, better reputation and higher employee and management involvement (Curkovic and Sroufe, 2011). Indeed, the environmental management system (EMS) certification has become a universal tool to signal the environmental competency of the firm and its ability to achieve positive economic returns.

In the last decade environmental scholars have analyzed intensively the relationship between EMSs—business performance

(Darnall et al., 2008a; Link and Naveh, 2006; Darnall and Edwards, 2006; Melnyk et al., 2003; Florida and Davison, 2001) and EMSs—environmental performance (Horbach et al., 2012; Russo, 2009; Nawrocka and Parker, 2009). Nevertheless, the result of this academic effort has provided inconclusive evidence and the questions of whether EMSs favor or hamper efforts to obtain better business performance, or if such systems are effective in improving environmental performance or, conversely, limit firms' innovative capacity, remain unsolved.

These inconsistent results have been recently remarked by Albertini (2013) and Wagner (2008), raising the need of moving the focus of analysis away from considering EMSs as primary determinants of firm environmental or business performance, to take into consideration that EMSs don't operate in isolation and that their existence must be understood in connection with firm's environmental resources and capabilities. Therefore this study aims to highlight the

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importance of environmental capabilities' complementarities (Darnall et al., 2008b), between environmental product innovation and EMSs capabilities, as the crucial element that facilitates the achievement of positive business performance derived from the implementation of such systems.

Therefore, by addressing Wagner's (2008) recommendations on the need to analyze EMSs beyond certification and to thoroughly analyze the moderating effects that influence the relationship between environmental innovation and business results (Wagner, 2010), this study aims to clarify the function of EMSs as moderating elements in the environmental innovation–business performance relationship. To this end we emphasize the importance of environmental capabilities' complementarities (Darnall et al., 2008b), between environmental product innovation and EMSs, as the crucial element that facilitates the achievement of positive business performance derived from the implementation of such systems.

To achieve this objective, we go beyond certification and further develop Wagner's (2009) last proposal using an innovative measure of EMSs that considers not only certification but also the scope and comprehensiveness (Darnall et al., 2008a) of such systems (taking into account the degree of development of the distinctive elements that are part of these systems). In addition, to address the calls from institutions and authors that demand a stronger presence of products in the environmental management research (Rennings et al., 2006; Rehfeld et al., 2007), we investigate the environmental product innovations as a measure of environmental performance (First and Khetriwal, 2010).

The article is organized as follows: first, it analyzes the current perspectives on the role of EMSs, to subsequently remark the need to change the focus of analysis and consider EMSs, instead of as primary determinants of environmental and competitive performance, as contributing elements – through its moderating role – toward that end. Finally, after explaining the methodological aspects of the work, our results and conclusions are presented together with some future research lines.

2. Theoretical framework and hypothesis development

EMSs are considered as “soft” environmental policy instruments in contrast to less flexible instruments, such as regulation (Iraldo et al., 2009) and represent an organizational change and a self-regulation effort on the part of businesses that consist of defining a set of formal environmental policies, goals, strategies and administrative procedures aimed to improve the environmental performance of the organization (Anton et al., 2004).

Drawing upon the resource-based view postulates, the Natural Resource-Based View (Hart, 1995), argues that EMSs (in a similar way that Total Quality Management Systems) contribute to the development of tacit skills, which are hardly replicable by other firms and therefore can facilitate competitive advantage achievement. In this sense, they improve the organizational capital of the firm, putting in place the environmental management and administrative processes that will guide the environmental action of the company. In other words, EMSs create the necessary conditions for environmental capabilities to be more efficient, contributing this way to strengthen the environmental orientation of the

firm and facilitating that environmental considerations become an integral element of business strategy (Darnall, 2006).

Thus, from the resource-based view perspective, EMSs have the potential to enable organizations to decrease the environmental impact of their activities, and to improve the quality of firms' operations, providing coordination in the search for environmental objectives that can result in operational efficiencies and competitive advantages (Bansal and Hunter, 2003).

Nevertheless, although previous arguments suggest that these systems have positive environmental and competitive effects, neither their environmental performance improvements nor their competitive benefits are clear for the academia. As we will show below, the empirical literature around the topic is inconclusive, revealing the need of re-examining the role of EMSs in the environmental management of the firms.

2.1. Current perspectives on the role of environmental management systems

The importance that has been granted to the EMSs in the last decade is such that many authors have signaled their mere existence as the crucial factor to be considered to explain firms' environmental and business performance improvements.

This main assumption is supported by two main streams that advance in parallel and characterize the literature on the topic. One research perspective focuses on the effects of these systems in competitive terms, whereas the other perspective analyzes the relationship between EMSs and different measures of environmental performance.

Among the studies that mention the positive effect of EMSs on firm performance, we can find contributions that associate these systems with decreased costs and improved competitiveness (Melnyk et al., 2003; Darnall, 2006), increased business volume and exports (Rennings et al., 2006), competitive advantages (Delmas, 2001) and firm reputation and image improvements (Wagner and Schaltegger, 2004; Bansal and Hunter, 2003). In addition, these systems are also associated with improved operational performance and improvements in the product quality (Delmas and Grant, 2014) and in the positioning of the business in the market (Sroufe, 2003).

Nevertheless, there are also significant contributions that do not share this positive perspective. For example, Link and Naveh (2006) find no evidence to support a positive relationship between ISO 14001 certification and firm performance, and Iraldo et al. (2009) consider that the adoption of an environmental management system (certified or not) on its own, does not suffice to improve firms' competitiveness. In the same vein, other scholars argue that these standardized systems can constitute a limit and an obstacle to firms' innovative capabilities (Könola and Unruh, 2007), as well as an additional source of cost (Darnall and Edwards, 2006). In addition, it is argued that EMSs are often useful instruments to reduce the pressure from the majority of stakeholders (Lannelongue and González-Benito, 2012). That is, they play primarily a legitimizing role (Bansal and Hunter, 2003) that does not necessarily translate directly into improved results.

On the other hand, a variety of contributions have also analyzed the determinant role of EMSs in their relationship with firm environmental performance.

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