



Analysis of benefits and difficulties associated with firms' Environmental Management Systems: the case of the Spanish automotive industry



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ABSTRACT

Adopting an Environmental Management System can offer firms a number of benefits, but also runs up against some difficulties. Firms need to weigh up these benefits and difficulties to evaluate their investment in such a system. This work aims to examine the use of Environmental Management Systems in a strategic sector in Spain: its automotive industry. We identify the main benefits firms obtain from these systems, and the difficulties they face in their implementation and certification. The literature offers homogenous results for the difficulties, but not for the benefits, which are conditioned by the sector and country under analysis. We obtain data via a questionnaire from 228 firms including manufacturers and suppliers. We then carry out a factor analysis to determine the latent constructs relating to benefits and difficulties. According to our results, the benefits of these systems are improvements in the firm's market position, stakeholder relations, and environmental performance, and access to environmental technologies. The difficulties are the requirements of the system, the organisational structure and commitment of the human resources (managers and workers), and the environmental information in terms of establishing objectives, calculating outcomes and establishing workers' environmental responsibilities.

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1. Introduction

Today's society is concerned about the degradation of the environment as a consequence of industrial activity, which consumes huge quantities of resources and energy and generates global environmental risks in need of immediate solutions (Rezaee and Elam, 2000; Banerjee, 2001). This growing social concern is shaping firms' environments, forcing them to make significant changes in their production and management practices (Bansal and Roth, 2000).

Pressure for firms to work towards environmentally responsible behaviour is coming from many directions: from the market, both from the economy in general and from the firm's particular sector; from society, in the shape of public opinion in general and associations and non-governmental organisations; from the finance sector, via investors, banks and financial firms, and insurance

companies; and from the public administration (Fineman and Clarke, 1996).

Firms can reduce the environmental impact of their industrial activities in a number of ways: an adequate environmental management, substituting environmentally damaging processes, incremental innovations towards "clean production", and so on (Moors et al., 2005). But not all sectors respond to environmental problems in the same way because of the particular characteristics of their processes and products.

Environmental management has evolved and is now recognised as a key area for companies wanting to be competitive in the global economy (Nunes and Bennet, 2010). Environmental Management Systems (EMSs) have helped firms respond to the environmental challenge (Zutshi and Sohal, 2004). Various systems exist, but the most important are the international ISO 14001 and the EU's EMAS (Watson and Emery, 2004). Both these systems have been implemented in many organisations, of all sizes and in all sectors (Rezaee and Elam, 2000). In 2001, EMAS was revised to EMAS II, and since then the system has incorporated all the requirements of ISO 14001 for Environmental Management Systems (Gernuks et al., 2007).

Environmental management will not always return a profit for an individual initiative or provide a match with all corporate objectives

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(Nunes and Bennet, 2010). For this reason, it is useful to examine the benefits firms can obtain from implementing the standard. Firms obtain a number of benefits from implementing EMSs, but they must overcome a number of difficulties in the process. “There is a great need for research providing evidence about the advantages and disadvantages of EMS” (Poksinska et al., 2003: 586). In recent years researchers have investigated these advantages and disadvantages, but they have yet to reach a consensus. The literature finds that these systems offer firms both tangible and intangible benefits, including cost savings, improvements in management control, better satisfaction of customer expectations, and lower liability risks (Lawrence et al., 2002; Quazi, 1999). But firms run up against difficulties in terms of costs, time, and complexity (Prajogo et al., 2012). The study of the benefits and difficulties is complex and related to different aspects and issues, such as quality, productivity, image, and relations with stakeholders (Fisher, 2003; Hwee Nga, 2009; Psomas et al., 2011). A critical point is that firms do not know a priori the difficulties they may face if they implement an EMS, or its potential benefits. If these firms are given information about similar experiences differentiated by sectors, this will help their decision-making with respect to the EMS.

Research on the EMS mostly involves very varied samples from different sectors with a great variability of factors that could affect the results (Comoglio and Botta, 2012). Big variations in the benefits and difficulties associated with ISO 14001 can be related to the industry sector in which firms compete (Arenas et al., 2012), and the country can also have an effect. In this research we focus on a specific industrial sector – the automotive industry – which is present in many different countries around the world and is characterised by practices and a management style that are independent of country and recognised internationally (Sutherland et al., 2004). The literature has not previously analysed the benefits and difficulties associated with EMSs in this sector.

The aim of the current work is to determine the proportion of firms in the Spanish automotive industry that have implemented Environmental Management Systems, and their level of implementation, and identify the main benefits and difficulties firms report when implementing and certifying these systems through the latent factors associated with their benefits and difficulties.

The analysis of the benefits of implementation may encourage some firms to continue to invest in this area, while the analysis of the difficulties could shed some light on how to overcome them. Firms from the automotive industry and other sectors have come to realise that the environmental management of various automotive operations can offer benefits from environmental, economic, and competitive perspectives (Sarkis, 2001; Zhu et al., 2007).

The rest of this work is structured as follows. First, we review the literature on Environmental Management Systems, in particular with reference to their benefits and the difficulties firms encounter during implementation and certification. In the research design we briefly describe how we obtained our information and carried out the empirical analysis. The analysis of the results and the discussion follow, and we end with the main conclusions of our study, future lines of research and limitations.

2. Environmental Management Systems: literature review

Firms are subject to pressure from all sides to try to protect the environment while remaining competitive. They can integrate concern for the environment into the organisation as a whole by implementing an EMS and certifying the system with an international standard like ISO 14001 or EMAS.

The idea of an EMS is to guide companies in the evaluation of barriers and key drivers for environmental improvement (Arenas et al., 2012).

The number of ISO 14001 certifications has continued to grow all around the world in the past decade. By the end of 2011, 267,457 firms were certified around the world, with Spain in fourth place in terms of number of certified firms, behind China, Japan and Italy (ISO Survey, 2011). In principle, ISO 14001 certification does not guarantee legal compliance, but pushes the firm towards it. In practice, certification has more wide-ranging effects that need to be studied.

In order to analyse firms' EMS implementation we must distinguish two effects (Psomas et al., 2011). First, the positive outcomes firms can expect from adopting an EMS (benefits); and second, the negative outcomes that prevent or hinder the adoption of such a system (difficulties or barriers).

2.1. Benefits of EMS implementation: perceived outcomes

Implementing and then certifying an EMS can help firms to achieve competitive advantages. The process can generate key resources and capabilities (Heras-Saizarbitoria et al., 2011). The human resources learn and acquire skills, the firm's reputation improves, its information systems improve, and incentives for innovation are encouraged (Cañón and Garcés, 2006). Many of these outcomes are dependent on managers' attitude towards environmental issues (Martín-Peña et al., 2010).

Various authors analyse the benefits of implementing an EMS and group them in categories. Thus Poksinska et al. (2003) differentiate between internal performance, external marketing and relations benefits. Hillary (2004) distinguishes between internal and external benefits. Link and Naveh (2006) distinguish between environmental performance and business performance. Gavronski et al. (2008) emphasise four groups: productivity benefits, financial benefits, market benefits, and societal benefits. Some of these categories are theoretical, and based on the concept and scope of the benefits identified, while others are the result of empirical studies in particular sectors and countries.

From our literature review we have been able to identify the most commonly analysed benefits (Hillary, 2004; Tarí et al., 2012).

Thus some authors study the *improvement in quality*. They stress the improvement in overall quality (Montabon et al., 2000), the introduction of training systems in areas previously lacking them, and the improvement in innovation (Fisher, 2003). The introduction of environmental innovations can help firms improve quality and hence their market share (Shirvastava, 1995a, b; Noci and Verganti, 1999; Proto and Supino, 2000; Melnyk et al., 2003; Hillary, 2004).

Employees and managers' motivation can be related to informal communication. Firms can improve their communications channels and their employees' skills, knowledge and attitudes by adopting EMSs (Russo and Fouts, 1997; Chin and Pun, 1999; Bansal and Roth, 2000; Hui et al., 2001). These systems encourage new interactions between managers and workers, generating intangible benefits as a result of the improvement in employees' motivation and satisfaction (Clemments, 1996; Thornton, 2000; Hanna et al., 2000; Rondinelli and Berry, 2000; Hillary, 2004; Gavronski et al., 2008; Padma et al., 2008).

The reduction in costs and improvement in productivity (efficiency) is a widely recognised benefit (Hart, 1995; Montabon et al., 2000; Melnyk et al., 2003; Gavronski et al., 2008; Padma et al., 2008).

Other authors analyse the *improvement in the competitive position*. Firms can improve their competitive position by means of environmental management, since eliminating waste and substituting materials that do not add value generate cost reductions (Gupta and Sharma, 1996; Rondinelli and Berry, 2000; Ann et al., 2006; Hwee Nga, 2009).

Another important aspect is the *firm's market acceptance and consumer satisfaction*. A key benefit of adopting EMSs is that firms

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