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Benefits of the ISO 9001 and ISO 14001 standards: a literature review

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Introduction

Quality management (QM) and environmental management (EM) are business practices that may benefit companies. As several empirical studies have shown, implementing QM effectively can influence firm performance positively (Powell 1995; Samson and Terziovski 1999; Huarng and Chen, 2002; Kaynak 2003; Parast *et al*., 2011). Similarly, EM may affect firm performance positively (Klassen and McLaughlin 1996; King and Lenox 2002; Al-Tuwaijri *et al.* 2004; Moneva and Ortas, 2010).

In this context, management system standards (MSSs) have enjoyed enormous success over the last years, both in the sphere of QM (ISO 9001) and in that of EM (ISO 14001). Over the last years, both standards have experienced a great international growth (Marimón *et al*., 2010). By the end of 2008 over 980,000 ISO 9001 certificates had been granted in a total of 176 countries worldwide, which doubled by far the number of certificates at the end of 2000. Similarly, by the end of 2008 the number of ISO 14001 certificates was 188,815 (ISO, 2009).

As various authors have pointed out (e.g., Delmas, 2001; Braun, 2005), the ISO 9001 and 14001 standards do not refer to the compliance with a given goal or result. In other words, they are not performance standards measuring the quality of a firm's products or services or a firm's environmental results; rather, they are standards setting out the need to systematize and formalize a large number of corporate processes within a set of procedures, and to document such implementation. It must also be remembered that the implementation of this type of standard is a voluntary one, although in some sectors it has *de facto* become an obligatory measure, given the coercive influence of customers (Braun, 2005; Mendel, 2006).

Given this "non-performance" orientation of standards, a large number of studies have analyzed the benefits that may be obtained through ISO 9001 and ISO 14001 certification and implementation. However, to the best of our knowledge no systematic review has been made of the empirical studies analyzing the benefits arising from these two standards in one single study. As various authors have pointed out, both standards have many similarities in terms of their

structure and dissemination processes (Corbett and Kirsch, 2001; Corbett, 2006; Marimón *et al.*, 2006). The purpose of this paper is to carry out a review of the empirical literature which has examined the benefits that may be attained through the ISO 9001 and 14001 standards. In addition to identifying the most analyzed benefits in each of the standards, the main similarities and differences in these benefits will be pointed out. Moreover, some ideas will be proposed that may be considered in future research on the measure of certification, its interiorization and selection effect.

The paper is structured as follows. Firstly, in the methodology section, the search strategy is described. Then, the results are shown. In the discussion and conclusion section, the benefits of the two standards are compared, and some important issues are examined, such as the ISO measurement (interiorization) and selection effect.

Methodology

A literature review is made in order to identify the benefits of the ISO 9001 and ISO 14001 standards. Therefore, empirical studies related to ISO 9001 and benefits, and ISO 14001 and benefits are reviewed in order to show the impacts on performance of these standards.

Regarding the review of these empirical studies, a computer search of the ABI Inform, Emerald and Science Direct databases was conducted. In the field of ISO 9001, a search was made for works that related the expressions ISO 9000, or ISO 9001 to performance or benefits or profitability in the title or the abstract of the paper. In the field of EM, the computer search was made for works that related the expressions ISO 14000, or ISO 14001 to performance or benefits or profitability in the title or the abstract of the paper. The list of references given in the papers found in the electronic search was also reviewed. Theoretical papers and those based on anecdotal evidence or case studies were eliminated.

Based on our research method, 82 empirical papers were finally identified and reviewed regarding the benefits of ISO 9001. Out of the 82 studies, the benefits pointed out were analyzed, and the following 13 benefits were considered as those most used by the authors:

- Market share (MS)
- Exports (EX)
- Sales and sales growth (SG)
- Profitability (P)
- Improvement in competitive position/competitive advantage (CA)
- Improvement in systematization (improved documentation, work procedures, clarity of work, improvement in responsibilities) (S)
- Efficiency (productivity, savings in costs, reduction in mistakes and rework, shorter lead time, improved management control) (EF)
- Improved quality in product/service (PQ)
- Improved image (I)
- Improvements in employee results (motivation, satisfaction, teams, communication, knowledge) (EMP)
- Improved customer satisfaction (reduction in complaints, etc.) (CUS)
- Improved relationships with suppliers (SUP)

- Improved relationships with authorities and other stakeholders (STA)

Following the same criterion, 29 papers were identified regarding the benefits of ISO 14001. It is worth pointing out that the same benefits have been found as those identified in the studies on the ISO 9001 standard, but in addition to these an extra specific benefit has been identified: environmental performance (ENVP).

Benefits of the ISO 9001 standard

Many scholars have analyzed the benefits of the ISO 9001 standard in several performance dimensions as previous section shows. Table I shows which of these benefits are dealt with by the 82 studies examined.

Table I. Benefits of the ISO 9001 standard: a summary

Number of studies	MS	EX	SG	P	CA	S	EF	PQ	I	EMP	CUS	SUP	STA
82	33	20	30	35	18	34	58	23	26	38	52	16	5

Source: Summary compiled by the authors.

Table I shows that the three benefits most frequently analyzed by researchers were improved efficiency, improved customer satisfaction and improvements in relations with employees. These are followed by profitability and improved systematization. Other benefits attained by many firms, as analyzed by the studies, are an improvement in market share and sales, image, product/service quality and exports. Conversely, the three benefits least studied are an improvement in competitive position, improved relations with suppliers and improved relations with authorities and other stakeholders.

In order to analyze these benefits arising from the ISO 9001 standard, some authors have examined its effects through a list of benefits, whereas others base themselves on, or even propose, a classification of such benefits. Such is the case of Lee (1998), who classifies benefits into benefits gained with respect to internal operations (better team spirit, less staff conflict, reduced wastage, increase efficiency, shorter lead time), benefits gained with respect to customer relations (improved sales through new customers, longer contracts with existing customers, less control from existing customers, fewer complaints from existing customers), and benefits gained with respect to subcontractor relations (subcontractors to become certified, better relations with subcontractors, more stringent control over subcontractors).

Nield and Kozak (1999) show that the benefits of the standard may be the following: operational benefits (improved operating systems, enhanced operating practices), marketing benefits (improved customer satisfaction, gained competitive edge, nation-wide recognition), human resources benefits (gained more committed work force, reduction in staff turnover).

Casadesús and Giménez (2000) show that these benefits are people results (work satisfaction, suggestions system, health/safety, turnover, absenteeism), operation results (errors and defects; order processing; reliability; costs; on-time-delivery; cost savings; lead time; stock rotation), customer results (customer satisfaction; complaints; repeat purchases) and financial results (market share; sales; return on sales; return on assets).

Casadesús *et al.* (2001) classified benefits as internal benefits and external benefits. Internal benefits are the following: work satisfaction, safety at work, suggestion system, absence from work, salaries of workers, safety and reliability, on-time delivery, order processing, number of errors, stock rotation, quality costs, cost savings. As external benefits they find the following: customer satisfaction, number of complaints, number of repeat purchases, market share, sales per employee, return on assets, return on sales.

Casadesús and Karapetrovic (2005) find that these benefits may be related to financial results (increased sales, returns on investment, market share, and sales per employee), operational results (reduced logistic costs, improved supplier relationship, increased inventory turnover, fewer non-conformities, compliance with delivery dates, and shorter lead time) and customer-related results (loyalty purchases, customer satisfaction, and fewer complaints).

Similarly, other scholars use two general groups of benefits related to operational performance and financial performance (Naveh and Marcus, 2004; Briscoe *et al.*, 2005). For example, for operational performance Naveh and Marcus (2004) show defect rate, cost of quality, productivity, on-time delivery and customer satisfaction, while Briscoe *et al*. (2005) list defect rate as a percent of production, cost of quality, productivity, and on-time delivery. For financial performance both studies shown market share, sales, and export growth.

As regards benefits found by scholars and the classifications proposed, in general terms, the ISO 9001 standard creates benefits related to customer satisfaction (for instance, fewer complaints and improved customer satisfaction) (e.g., Casadesús and Karapetrovic, 2005; Singh, 2008), improvement in staff management issues (for instance, more training for employees) (e.g., Gupta, 2000; Renuka and Venkateshwara, 2006) and improved efficiency, documentation and clear knowledge of tasks by employees (e.g., Chow-Chua *et al.,* 2003; Magd, 2008). These results indicate that most firms have experienced improvement in these issues, due to the fact that the ISO 9001 standard allows them to reduce mistakes and rework, save on costs and improve the management of the firm. Many firms also attain these benefits because ISO 9001 allows for an improvement of the documentation and work procedures, and a greater clarity of work. Other benefits obtained by many firms are an improved image and an improved service or product quality, because the fact that they possess a certificate enhances their image in the eyes of their customers. In turn, the greater control exercised upon their internal processes allows them to improve the quality of the product or service.

Similarly, several studies have provided evidence of certified firms outperforming non-certified firms (Heras *et al*., 2002; Corbett *et al*., 2005; Sharma, 2005). This improvement is attributed largely to improvement in internal business processes. In this context, other studies also show that ISO 9001 certification is not associated with significant financial performance in the longer term, or that there is no significant difference between the impacts of quality management on financial performance for firms with and without ISO 9001 certification (Häversjö, 2000; Singels *et al.,* 2001; Tsekouras *et al.,* 2002).

These ideas indicate that, although there are firms that do succeed in improving their financial results (for instance, their market share and their sales, because the quality certificate opens the door to certain customers), there are many others that do not manage to attain any improvement.

Therefore, as the studies have shown, there is not such an unquestionable relationship between the standard and the financial results.
Consequently, the impact of ISO 9001 on firm performance was more mixed compared with the impact of QM on firm performance, which was much more unanimous (Martínez-Costa *et al.*, 2008). Therefore, the clearest benefits are those influencing the internal performance or operational results, and customer results.

Benefits of the ISO 14001 standard

As in the ISO 9001 standard field, the benefits associated with the implementation and certification of the ISO 14001 standard have also been extensively analyzed in the academic literature. The main benefits identified in the empirical literature are presented in Table II.

Table II. Benefits of the ISO 14001 standard: a summary

Number of studies	MS	EX	SG	P	CA	S	EF	PQ	I	EMP	CUS	SUP	STA	ENVP
29	5	6	1	16	10	9	16	4	14	13	14	7	10	23

Source: Summary compiled by the authors.

Table II shows that the three benefits most considered by the studies identified are environmental performance, efficiency and profitability. Other benefits which have also merited great attention are improved image, improvement in customer satisfaction, improved staff results, improved competitive edge and improved relations with stakeholders. Conversely, the benefits least considered in the empirical studies analyzed are improved sales, improved product quality and increased market share.

As was the case with the studies on ISO 9001, some studies analyzing the ISO 14001 norm have also proposed several groups of benefits. For instance, Poksinska *et al.* (2003) pointed out three groups of benefits: internal performance benefits (cost reductions, environmental improvements, increased productivity, increased profit margin, improved internal procedures, improved employee morale), external marketing benefits (improved corporate image, increased market share, increased customer satisfaction, increased on-time delivery to customers) and relations benefits (improved relations with communities, improved relations with authorities).

Hillary (2004) distinguished between internal and external benefits. In addition, this author divided internal benefits in several groups: organisational benefits (quality of management, quality of training, working conditions and safety, quality of environmental information, legal compliance, encouragement of innovation, improved procedures, strategic overview of environmental responsibility), financial benefits (cost savings from material, energy and waste reductions), and people benefits (increased employee motivation, enhanced skills, better company image among employees, forum for dialogue between staff and management). External benefits may also be divided in different groups: commercial benefits (gaining new customers/business and satisfying existing customers, gaining competitive/marketing advantage, staying in business, developing more environmentally friendly products), environmental benefits (improved environmental performance, assured legal compliance, increased energy and material efficiencies, reduced pollution), and communication benefits (positive public image, better

customer relationships, better cooperation and relationships with regulators and administrative bodies, improved communication with stakeholders, set an example for other companies in a sector).

Zeng *et al.* (2005) also considered several groups of benefits: internal operations (enhanced efficiency, well-defined responsibility, enhanced environmental awareness, standardization of environmental management), corporate management (fewer complaints, improved profitability, savings in resources and reduced wastage, increased social recognition), marketing effects (enlarged market share, confidence from customers, improved corporate image), and supplier relations (better relations with suppliers, more stringent control over suppliers, promoting ISO 14001 certification to suppliers, enhanced environmental awareness of suppliers).

Link and Naveh (2006) distinguished between environmental performance (pollution emission, use of recycled materials and other environmental aspects) and business performance (annual gross profit margin, investment in R&D, sales, sales per employee and business with foreign organizations).

Gavronski *et al.* (2008) emphasized four groups of benefits: productivity benefits (resource usage reduction, optimization of process flows, production costs reduction, better employee motivation), financial benefits (opportunity to obtain investment funds from governmental organizations, access to special credit with reduced interest rates, reduction of insurance premia), market benefits (competitive advantages, positive effects on the market and with customers, opportunity to set an example for suppliers) and societal benefits (improved corporate image for society in general, reduced environmental liability, improved cooperation from environmental authorities).

As in the case of the ISO 9001 standard, in general terms the studies show that ISO 14001 standard had a significant impact on a high number of benefits. However, some studies have found no positive relation between the implementation of ISO 14001 and performance. For example, Cañón and Garcés (2006), through an event study, found that ISO 14001 certification had a negative impact on stock price. Besides, Link and Naveh (2006) found that, although a greater management standardization in environmental issues does lead to better environmental performance, such environmental performance does not have an influence upon business performance.

Discussion and conclusions

This paper has reviewed the literature on the ISO 9001 and ISO 14001 standards and their benefits, in order to examine the benefits analyzed and the similarities and differences regarding these benefits in these two standards. On the basis of this analysis the paper suggests several ideas about similarities and differences, classification of benefits, interiorization, integration, and the selection effect.

First, Tables I and II show that the benefits most analyzed by researchers, both concerning ISO 9001 and ISO 14001, are improved efficiency and profitability, improved customer satisfaction, improved relationship with staff and image.

Other benefits analyzed for ISO 9001, although to a lesser extent, are market share, sales and product quality. These three benefits are those least analyzed for the ISO 14001 standard. Moreover, the environmental performance, the most common benefits in the ISO 14001 standard, has no examined by the ISO 9001 standard. In addition, relationship with stakeholders is considered by a high number of studies in ISO 14001 but is the least studied by the ISO 9001 works.

Second, in general terms, the benefits of ISO 9001 and ISO 14001 may be classified into internal and external ones. Other studies propose a wider classification, including people-related, operational, customer and financial benefits, which in turn could be then divided into internal and external. According to these studies, internal benefits include improvements in corporate processes having positive effects on operational and people issues (e.g. increase in productivity, improvement in efficiency and reduction in costs and waste, training). External benefits relate to effects on customers and society in general (e.g. customer satisfaction, better relationships with stakeholders, improved image). In this context, some studies classify financial results as external benefits and other as internal benefits.

Consequently, in this context, both standards show clear benefits on certain issues, such as efficiency, employees, systematization, customers and other stakeholders, which indicates that, in general terms, certified firms improve people, operational and stakeholder performance. Nevertheless, only some certified firms do better than non-certified firms regarding financial performance. As was pointed out in the previous section, both for ISO 9001 and for ISO 14001, studies can be found showing that there is no impact on financial performance. Therefore, although the standards do create internal and external benefits, and therefore many of them have positive effect upon people, operational issues and stakeholders, the relationship between these standards and financial performance is not so clear.

Third, several scholars show that more internally motivated firms saw better performance outcomes, for both internal and external performance, both for ISO 9001 (Lee, 1998, Jones *et al.*, 1997; Singels *et al.*, 2001; Boiral and Roy, 2007; Martínez-Costa *et al.*, 2008) and for ISO 14001 (Boiral and Sala, 1998; Rondinelli and Vastag, 2000; Kitazawa and Sarkis, 2000). This indicates that certification in itself leads to few benefits. However, when a firm really applies the quality system underlying the standard, and there is a real commitment to quality and to the environment, that is, when the standards are interiorized, there is an increased possibility of attaining the benefits listed, including the financial ones.

In this context, an important issue in the works identified is the measurement of certification. Most of the studies analyzing the benefits of ISO 9001 and 14001 consider a dichotomic variable to see whether the firm is certified or not, but do not analyze the degree of commitment, implementation, or internalization of, the ISO standards. In this respect, many studies measuring QM have used a number of practices in order to measure it as a multidimensional construct (Powell, 1995; Kaynak, 2003; Prajogo and Sohal, 2006). For instance, those works measuring QM as a multidimensional construct use practices like the following: leadership, people management, customer management, relationships with suppliers, process management and information and analysis. Each of these constructs is measured through a set of items. In this way, the authors may analyze the QM level, and thus examine if a higher level in QM leads to increased results. In the field of EM there are also studies measuring the degree of environmental

proactiveness using various practices and critical factors for implementation (Quazi, 1999; Kitazawa and Sarkis, 2000; Lin *et al.*, 2001; Govindarajulu and Daily, 2004; González-Benito and González-Benito, 2005; Wee and Quazi, 2005).

These issues have been little analyzed in the case of ISO 9001 and ISO 14001. Thus, for instance, only a few authors measured the variable ISO 9001 as a set of dimensions made up of various items, in order to examine the degree of interiorization of the variable. This indicates that few studies used ISO 9000 key management practices to assess ISO 9000 and then analyzed their effects on firm performance, as many studies about QM have done measuring QM as a multidimensional construct. For example, Naveh and Marcus (2004) used several measures to examine the adoption of the ISO 9001 standard (e.g. going beyond; used in daily practice; applied to solving problems; integrated; kept current; externally coordinated). Their results show that the impact of ISO 9001 on performance depends on the level of assimilation (i.e. the degree to which the practice makes its way into various aspects of the organisational life) and the degree to which the organisation goes beyond the minimal practice requirements. More success is achieved if there is both thorough assimilation of the practice and the firm goes beyond what the practice requires. Then, though the ISO 9001 standard itself is homogenous, the way a firm implements it introduces variations that can distinguish the organisation from its competitors in operating performance and in this way gives the individual organisation an advantage (Naveh and Marcus, 2004, 2005). Similarly, Singh (2008) identified a validated framework for effective implementation of ISO 9000. The author used six constructs to measure management practices associated with the standard: management policies, plans and actions; focus on customers; capable employees; reliable suppliers; sound communication system; and steady processes. These ideas suggest that quality certification may be important for competitiveness, but it is the way such certification is implemented and internalized that makes it possible to derive the benefits described by the literature. Thus, when certification is used in daily practice and as a catalyst for change, the organisation could achieve a distinct operating advantage from implementation (Naveh and Marcus, 2005).

Studies on ISO 14001 that emphasize this idea can also be found. Link and Naveh (2006) point out that, for this standard to be really effective, it must be made a part of daily work. These authors measured the degree of standardization, considering the degree to which ISO 14001 rules, policies, and procedures govern the managing of organizational environmental issues, using six items from Naveh and Marcus (2004). Schylander and Martinuzzi (2007) pointed out that, in order to develop an ISO 14001 environmental management system into a sustainability management system, the two most important challenges are to improve coordination between the EM and the organization's strategies and to synchronize the EM with central value chains. Quazi (2001) emphasized that environmental management should be integrated into the organizational strategic planning process. Yin and Schmeidler (2009) indicated that standardized management systems may be implemented very differently in different organizations. According to these scholars, this variability in implementation may be responsible for the heterogeneous performance of these standardized systems, and they emphasize that the current literature on the environmental impacts of ISO 14001 certification has largely neglected this phenomenon. These authors considered the integration of ISO 14001 standards into daily operations, and the inclusion of performance management elements in the ISO 14001 standard.

Four, many similarities exist between QM and EM systems. For example, their purposes and implementation-related factors are very much alike. Considering these parallels, and since research on QM is more fully developed than that on EM, significant benefits can be expected from applying the knowledge acquired about QM to environmental issues (Klassen and McLaughlin, 1993; Curkovic, 2003). Moreover, an integrated system adds a number of benefits to those achieved by each of the systems alone. Among these benefits, the literature highlights the following (Wilkinson and Dale, 1999a,b; Poksinska *et al.* 2003; Zeng, Tian and Shi, 2005; Zutshi and Sohal, 2005):

- An improvement in the efficiency and effectiveness of the organisation, avoiding the duplication of effort,
- A reduction of bureaucracy by eliminating duplication of policies, procedures and registers,
- The alignment of goals, processes and resources,
- A reduction in the costs of internal and external audits, and
- The availability of joint training and improved communication between all organisational levels.

Finally, it was considered that an important issue regarding benefits is the analysis of whether there is a treatment effect and a selection effect. For instance, in the case of financial benefits, it would be interesting to know if the implementation of the standards leads to an improvement in these financial benefits (treatment effect) or if, on the contrary, it is precisely those firms with relative financial benefits over the average in the sector that are most likely to obtain certification (selection effect). In this respect, there a number of studies in the field of the ISO 9001 standard (Heras *et al.,* 2002; Dick *et al.,* 2008) which have verified the existence of both effects. In our opinion, new studies should be carried out regarding this issue for the various indicators of firm performance reviewed.

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