

---

This is the **accepted version** of the journal article:

Bernardo Vilamitjana, Mercè; Simon, Alexandra; Tarí, Juan José; [et al.]. «Benefits of management systems integration : a literature review». Journal of cleaner production, Vol. 94 (2015), p. 260-267. 8 pàg. DOI 10.1016/j.jclepro.2015.01.075

---

This version is available at <https://ddd.uab.cat/record/288488>

under the terms of the  license

---

This is the **accepted version** of the journal article:

Bernardo Vilamitjana, Mercè; Simon, Alexandra; Tarí, Juan José; [et al.]. «Benefits of management systems integration : a literature review». Journal of cleaner production, Vol. 94 (2015), p. 260-267. 8 pàg. DOI 10.1016/j.jclepro.2015.01.075

---

This version is available at <https://ddd.uab.cat/record/288488>

under the terms of the  license

## **Benefits of management systems integration: a literature review**

### **1. Introduction**

Quality management (QM) and environmental management (EM) are business practices that may benefit companies. As several empirical studies have shown, implementing QM (Huang and Chen, 2002; Kaynak, 2003; Parast et al., 2011) and EM (King and Lenox, 2002; Al-Tuwaijri et al. 2004; Moneva and Ortas, 2010) may effectively have a positive influence on firm performance. This positive effect may result from their impact on firm costs and differentiation levels. Firms that implement QM focus on providing superior value to the customer and on improving the efficiency of the processes. Continuous improvement of processes and product quality lead to increased revenues (through product reliability) and reduced costs (through process efficiency). Similarly, regarding EM, for example, pollution prevention can allow savings in input and energy consumption, and increase demand among environmentally sensitive consumers (Miles and Covin, 2000).

In this context, management system standards (MSSs) have enjoyed enormous success in recent years, both in the sphere of QM (ISO 9001) and in that of EM (ISO 14001). According to the most recent ISO data, the number of ISO 9001 certificates worldwide rose to 1,101,272 and ISO 14001 to 285,844 (see ISO, 2013). The implementation of this type of standards is voluntary, although in some sectors it has de facto become an obligatory measure, given the coercive influence of customers (Braun, 2005; Mendel, 2006). Also, research has been done on how far these type of standards have a significant impact on business performance, with some studies finding a positive link (Chow-Chua et al., 2003; Mokhtar and Muda, 2012), while other authors state that there is also evidence for the existence of a substantial mechanism whereby better performing firms self-select to adopt certification and therefore, this link cannot be proved (Dick et al., 2008; Lo et al., 2011). However, there is a consensus with a large number of studies which have analyzed the benefits that may be obtained from ISO 9001 and ISO 14001 implementation and certification (Link and Naveh, 2006; Zaramdini, 2007; Gavronski et al., 2008; Singh, 2008).

As various authors have pointed out, the two standards have many similarities in terms of their structure and dissemination processes (Corbett and Kirsch, 2001; Corbett, 2006; Marimón et al., 2010, 2011). These two standards also present similarities regarding the standard language used and the PDCA cycle of continual improvement. For example, both standards use a similar language using terms such as objectives, audits, procedures, records, etc. Both standards also focus on continuous improvement. In this regard, ISO 14001 requirements are classified taking into account the PDCA cycle. This suggests that those ISO 9001 certified companies working with quality objectives, procedures and records can easily adopt new objectives, procedures and records related to environmental requirements. Moreover, those companies implementing both standards can use similar practices to meet quality and environmental requirements. This similar structure and language can facilitate integration processes. Thus, following the steps of the PDCA cycle, the organization can create an effective integration strategy.

In sum, these similarities may lead to the integration of the two standards thereby achieving synergies and then increasing benefits. In this context, when organizations have multiple management systems (MSs) implemented, the next step is to manage them as a single system in order to benefit from the related synergies (see e.g., Karapetrovic and Willborn, 1998a, 1998b; Rocha et al., 2007; Karapetrovic and Casadesús, 2009), i.e., implementing an Integrated Management System

(IMS). According to Wilkinson and Dale (2000), all management systems can build an IMS, although the most analyzed are ISO 9001 and ISO 14001. In this vein, several studies have analyzed the different aspects of this process (e.g. Karapetrovic and Willborn, 1998a, 1998b; Karapetrovic et al., 2006; Zeng et al., 2007, 2011; Salomone, 2008; Bernardo et al., 2009, 2010, 2012a, 2012b; Tari et al., 2010; Simon et al., 2011, 2012a, 2012b). The main benefit of an IMS according to the existing literature, is to improve internal efficiency, viewed as a global concept consisting of integrated audits, optimization of resources, human resources motivation, etc. (see e.g., Karapetrovic and Willborn, 1998a; Douglas and Glen, 2000; Zeng et al., 2005; Salomone, 2008).

The implementation of both MSSs, either separately or in an integrated fashion, leads to the obtaining of benefits. Although some studies analyze the benefits from these standards separately by means of a literature review (e.g. Psomas and Fotopoulos, 2009; Sampaio et al., 2009; Tarí et al., 2012), to the best of our knowledge there is no literature review of the empirical studies analyzing the benefits of IMSs. This issue can be interesting and relevant from an academic point of view and also for management practice. Consequently, the purpose of this paper is to identify the benefits of the IMSs through a literature review.

The contributions of this study can be summarized from two perspectives. First, from an academic position, this work supplements previous literature reviews about ISO 9001 and literature reviews about ISO 14001 and expands existing knowledge about the benefits of the IMSs by comparing them with the benefits obtained through ISO 9001 and ISO 14001 standards. In this regard, through the literature review, several groups of benefits are identified in order to summarize all benefits shown by previous studies, which can be used as a guide to identify impacts of IMSs in future empirical studies. Second, from a managerial perspective, this work may help practitioners to consider the benefits and advantages that can be achieved through an adequate integration of these management systems. This knowledge may help managers to make decisions about the level of integration in their companies.

The paper is structured as follows. First, a background on the benefits gained from ISO 9001 and ISO 14001 standards, managed separately or in an integrated fashion, is presented. Second, in the methodology section, the search strategy is described. The results show the benefits of integration and finally, in the conclusions section, the benefits are discussed and future research is proposed.

## 2. Literature review

### 2.1. *Benefits of the ISO 9001 and ISO 14001 standards*

Both ISO 9001 and ISO 14001 are the most widespread management system standards (MSSs) implemented and certified worldwide (see ISO, 2013). As the literature shows, many scholars have analyzed the benefits derived from the ISO 9001 and ISO 14001 standards on several performance dimensions. Table 1 shows which of these benefits are addressed in some previous studies.

In order to analyze the benefits arising from the ISO 9001 standard, some authors have used lists of benefits to examine its effects, whereas others have used or even proposed classifications of benefits, such as (1) internal benefits and external benefits (Casadesús et al., 2001), (2) benefits related to operational performance and financial performance (Naveh and Marcus, 2004; Briscoe et al., 2005), (3) benefits related to operational, customer, people, and financial results (Casadesús and Giménez, 2000; Karapetrovic et al., 2010), (4) other classifications (e.g. Lee, 1998; Nield and Kozak, 1999). A similar classification has been also proposed for the ISO 14001 standard: (1) internal and external benefits (Hillary, 2004), (2) internal performance benefits, external marketing benefits, and relationship benefits (Poksinska et al., 2003); environmental

performance and business performance (Link and Naveh, 2006), (4) other classifications (e.g. Zeng et al., 2005; Gavronski et al., 2008).

In this context, several benefits have been detected for both MSSs. The literature show positive effect on operational performance and there is not a clear relationship between the standard and financial results (Carrión and Garcés, 2006; Link and Naveh, 2006; Sampaio et al., 2009).

## *2.2. Integration of management systems*

Beyond ISO 9001 and ISO 14001, the proliferation of new MSSs of different nature and function, gives firms the option to integrate the corresponding MSs into a single and more efficient system in order to benefit from their existing synergies (Labodová, 2004; Zutshi and Sohal, 2005; Rocha et al., 2007; Karapetrovic and Casadesús, 2009). Karapetrovic and Willborn (1998b) propose that organizations integrate rather than separate their MSs and empirical studies regarding the scope of integration confirm this idea (Zeng et al. 2007; Salomone, 2008; Karapetrovic and Casadesús, 2009; Bernardo et al., 2009).

The integration of MSs can be defined as “putting together different function-specific management systems into a single and more effective IMS” (Beckmerhagen et al., 2003). Referring to the concept of synergy, Ansoff (1965) defined the term as “the effect of 2 + 2 = 5”, i.e. the effect whereby the integration of various elements produces maximization of the qualities of each element with a score higher than that which is derived from the simple sum of the elements.

The integration process can be defined according to four main aspects: integration strategy, integration methodology, integration level and audit systems' integration. Table 2 summarizes them.

Benefits have been also analyzed in the literature. Several authors have found that firms perceive value from having an IMS, such as costs savings, operational benefits, better external image and improved customer satisfaction (Zeng et al., 2007; Salomone, 2008; Asif et al., 2009). However, a literature review on this issue has not been conducted. In the next section, this review is carried out indicating the search strategy and the results.

## *3. Methodology*

The paper conducts a literature review in order to identify the benefits of the two standards managed as an IMS. A literature review is conducted to find information from various research articles which either justified or discouraged integration. In this literature review, empirical studies related to the integration of both standards and benefits are reviewed in order to show the impacts of these standards on performance.

Table 1

Benefits of the ISO 9001 and ISO 14001 standards.

Benefits	ISO 9001 studies	ISO 14001 studies
Efficiency (productivity, cost savings, reduction in mistakes and rework, shorter lead times, improved management control)	Singels et al. (2001), Gotzamani and Tsiotras (2002), Pan (2003), Arauz and Suzuki (2004), Lo and Chang (2007), Martínez-Costa et al. (2008), Singh (2008).	Yin and Schmeidler (2009), Gavronski et al. (2008), Padma et al. (2008), Zeng et al. (2005).
Improved customer satisfaction (reduction in complaints, etc.)	McAdam and McKeown (1999), Singels et al. (2001), Gotzamani and Tsiotras (2002), Pan (2003), Arauz and Suzuki (2004), Casadesús and Karapetrovic (2005), Lo and Chang (2007), Zaramdini (2007), Martínez-Costa et al. (2008), Singh (2008).	Gavronski et al. (2008), Padma et al. (2008), Annet et al. (2006).
Improvements in employee results (motivation, satisfaction, teams, communication, knowledge)	Arauz and Suzuki (2004), Casadesús and Karapetrovic (2005), Rodríguez-Escobar et al. (2006), Lo and Chang (2007), Zaramdini (2007), Martínez-Costa et al. (2008).	Gavronski et al. (2008), Tan (2005).
Profitability	Corbett et al. (2005), Lo and Chang (2007), Zaramdini (2007), Benner and Veloso (2008), Martínez-Costa et al. (2008).	Gavronski et al. (2008), Wahba (2008), Link and Naveh (2006), Zeng et al. (2005).
Improvement in systematization (improved documentation, work procedures, clarity of work, improvement in responsibilities)	Gotzamani and Tsiotras (2002), Rodríguez-Escobar et al. (2006), Lo and Chang (2007), Singh (2008).	Schylander and Martinuzzi (2007).
Market share	Rodríguez-Escobar et al. (2006), Lo and Chang (2007), Zaramdini (2007), Singh (2008).	Zeng et al. (2005). Link and Naveh (2006).
Sales and sales growth	Arauz and Suzuki (2004), Casadesús and Karapetrovic (2005), Corbett et al. (2005), Singh et al. (2006).	Padma et al. (2008), Tan (2005).
Improved image	Terziovski et al. (1997), Lee (1998), Magd and Curry (2003), Lo and Chang (2007), Zaramdini (2007).	Padma et al. (2008), Link and Naveh (2006).
Exports	Magd and Curry (2003), Arauz and Suzuki (2004), Singh et al. (2006).	
Improvement in competitive position/competitive advantage	Abraham et al. (2000), Rodríguez-Escobar et al. (2006), Singh et al. (2006), Lo and Chang (2007), Zaramdini (2007).	Ann et al. (2006), Gavronski et al. (2008), Schylander and Martinuzzi (2007).
Improved relationships with suppliers	Gotzamani and Tsiotras (2002), Karapetrovic (2005), Rodríguez-Escobar et al. (2006), Zaramdini (2007).	Gavronski et al. (2008), Padma et al. (2008). Melnik et al. (2003).
Improved quality in product/service	Gotzamani and Tsiotras (2002), Magd and Curry (2003), Zaramdini (2007), Singh (2008).	
Improved relationships with authorities and other stakeholders	Pan (2003), Magd and Curry (2003).	Gavronski et al. (2008), Schylander and Martinuzzi (2007), Zeng et al. (2005).
Environmental performance		Yin and Schmeidler (2009), Russo (2009), et al. (2008), Barla (2007), Zeng et al. (2005), Tan (2005), Potoski and Prakash (2005).

### 3.1. Literature search strategy

Academic papers were identified through a computer search from four databases: Web of Science, ScienceDirect, Scopus and

Emerald. The list of references given in the papers found in the electronic search was reviewed, and theoretical papers and those based on anecdotal evidence or case studies were eliminated.

Table 2  
Main aspects of integration of management systems.

Integration aspect	Definition	Main characteristics	Studies
Strategy	Number and implementation sequence of MSs that the organization decides to integrate	Establishing: (a) QMS first and then the EMS, (b) EMS first and the QMS second, (c) the two systems simultaneously	Karapetrovic and Willborn (1998b), Douglas and Glen (2000), Karapetrovic (2002), Karapetrovic et al. (2006), Bernardo et al. (2009, 2012a).
Methodology available to	Models or tools used in the process	National standards are  support integration  Academic authors	SAI Global (1999), Dansk Standard (2005), AENOR (2005), BSI (2012), ISO (2008). Karapetrovic and Willborn (1998a), Labodová (2004), Zeng et al. (2007), Asif et al. (2009), Tari and Molina-Azorín (2010).
Level managed	Degree achieved by the IMS	(1) no integration (MSs are separately), (2) partial integration (some components of the MSs are integrated), (3) full integration (all components of the MSs are integrated into a single system)	Wilkinson and Dale (1999), Karapetrovic (2003), Beckmerhagen et al. (2003), Karapetrovic et al. (2006), Bernardo et al. (2009).
Audits' systems	Integration level of internal and external audits	Higher level of integration in internal audits than in external audits	Karapetrovic and Willborn (1998c), Krauss and Grosskopf (2008), Bernardo et al. (2010, 2011a), Simon et al. (2011, 2014).

Table 3

Benefits from the integration of ISO 9001 and ISO 14001 standards.

Benefits			Studies
Internal (2009),	Global organization	Increase of organizational efficiency	Wagner (2007), Karapetrovic and Casadesús
			Santos et al. (2011), Simon et al. (2011, 2012a, 2012b), de Oliveira (2013), Simon and Douglas (2013).
		Task simplification (2013).	Simon et al. (2012a), Simon and Douglas
		Optimized resources (financial and human) to maintaining a single goal	Salomone (2008), Santos et al. (2011), Abad et al. (2014).
		Management cost reduction	Santos et al. (2011), Simon et al. (2011, 2014), Rebelo et al. (2014).
		Improved organization	Karapetrovic and Casadesús (2009), Santos et al. (2011), Sampaio et al. (2012).
		Time resources saved	Salomone (2008), Simon et al. (2011), Rebelo et al. (2014).
		Department barriers elimination and higher collaboration	Simon et al. (2012a).
		Continuous work	Karapetrovic and Casadesús (2009).
		Greater ease of decision making	de Oliveira (2013).
		Greater capacity to achieve objectives	Abad et al. (2014).
		Organizational global strategy improvements (2012a). Rule out conflicts of different company strategies (2008).	Simon et al.
		Common management policy, objectives, targets and Key Process Indicators related to performance	Salomone
		Better and easier communication system al. (2011),	Rebelo et al. (2014).
		Organizational culture improvements	Karapetrovic and Casadesús (2009), Santos et al. (2011),
	Improvements to risk management	Simon et al. (2012a, 2014), de Oliveira (2013), Abad et al. (2014).	
	Competitive market advantage	Simon et al. (2012a), Simon and Douglas (2013), Rebelo et al. (2014).	
	Easier compliance of legislation	Wagner (2007), Hamidi et al. (2012), Rebelo et al. (2014).	
	Increased employee training	Abad et al. (2014).	
	Optimization/unification of training activities	Santos et al. (2011).	
	Better employee awareness of the importance of their work as a contributor to the whole organization	Santos et al. (2011), Holm et al. (2014).	
	Human Resources	Team work	Salomone (2008).
		More competent workers	Karapetrovic and Casadesús (2009), Simon et al. (2012a), Abad et al. (2014), Rebelo et al. (2014).
More motivated staff		Curkovic et al. (2005), Hamidi et al. (2012), Holm et al. (2014).	
Increased performance		Abad et al. (2014).	
Improved quality of products and/or services (2014). Increased productivity		Abad et al. (2014).	
Increase in the reliability of products and processes		Wagner (2007), Tarí et al. (2010), Santos et al. (2011), Hamidi et al. (2012).	
Improvement of collection and analysis of customer feedback		de Oliveira (2013), Abad et al.	
Reduction in duplication of policies, procedures and records		Hamidi et al. (2012).	
More agile system with less redundancy		de Oliveira (2013).	
Simplified MSs resulting in less confusion, redundancy and conflicts in documentation		Crowder (2013).	
MSs		Simon and Douglas (2013), Simon et al. (2014).	
		Karapetrovic and Casadesús (2009).	
		Salomone (2008), Karapetrovic and Casadesús (2009), Santos et al. (2011), Simon et al.	



(2011), Sampaio et al.(2012).

External	Audits	Reduction of bureaucracy	Salomone (2008), Santos et al. (2011), Hamidi et al.(2012), Abad et al. (2014), Rebelo et al. (2014).
		Elimination of conflicts between individual systems	Rebelo et al. (2014).
		Improvement of systems understanding and use (2013).	Simon et al. (2012a), Simon and Douglas (2013).
		Easy to add a new standard	Karapetrovic and Casadesús (2009), Simon et al. (2011,2012a).
		Flexibility of the standards	Crowder (2013).
	Market	Better definition of management responsibilities and authority	Salomone (2008), Santos et al. (2011), Sampaio et al.(2012), Rebelo et al. (2014).
		Unification of internal audits	Salomone (2008), Santos et al. (2011), Rebelo et al. (2014).
		Reduction of costs of internal audits	Abad et al. (2014).
		Simplification of audits	Simon et al. (2011).
		Better use of audit results	Simon et al. (2012a, 2012b), Simon and Douglas (2013).
Internal	Stakeholders	Improved multiple audits	Simon and Douglas (2013).
		Company image improvements	Wagner (2007), Karapetrovic and Casadesús (2009), Santos et al. (2011), Simon et al. (2012a, 2012b), Crowder (2013), Simon and Douglas (2013), Abad et al.(2014), Rebelo et al. (2014).
		Sustainability components in a global market	Rebelo et al. (2014).
		Improvement of partnerships and satisfaction with the main stakeholders	Simon et al. (2012a), Rebelo et al. (2014).
		Integrated external audits	Salomone (2008), Karapetrovic and Casadesús (2009),Rebelo et al. (2014).

---



The search strategy used was to identify papers with “ISO 9000” or “ISO 9001”, and “ISO 14000” or “ISO 14001”, and that contained “integration”, “performance”, “benefits” or “profitability” as main subject headings or text words in the title or the abstract of the paper.

### 3.2. *Selection of articles for review*

Our literature search identified 59 empirical academic papers. Their titles, abstracts and texts were reviewed in detail by two of the authors for relevance to the study. Therefore, a research literature review was carried out contrasting it with more subjective examinations of recorded information as suggested by Hart (1998) and Fink (2009). Papers were included if they contained reference to the benefits that having an IMS brings to business results and were excluded if they only contained benefits about managing MSs separately or they did not refer to firm performance. Only 18 empirical papers met the inclusion/exclusion criteria for review additionally to accessibility limitations. Thus, 18 papers were finally identified and reviewed regarding the benefits of an IMS.

## 4. Results

The integration benefits found in the literature review are summarized in Table 3. The 18 studies obtained in the search are classified regarding the nature of benefits of an IMS, i.e., if they are internal or external to the organization, based on the classification of the benefits from the standards suggested by previous scholarly (Casadesús et al., 2001; Hillary, 2004). It is easy to see that the internal benefits are greater than the external ones, due to the fact that the decision to implement the integration is more internal than external (see also BSI, 2012), unlike the decision to implement the standards themselves. In order to ease the understanding of these benefits, in addition to internal and external, a subclassification has also been done. This is proposed depending on the benefits grouped based on previous scholarly (see e.g., Simon et al., 2012a): global organization, human resources, performance, MSs and audits for internal benefits, and stakeholders, market and audits for external.

According to the empirical studies analyzed, the main benefits from integrating MSSs (based on the number of studies that have highlighted them, as more studies conclude the same benefit, more important has been considered this benefit to understand the impact of the integration process for an organization) are improved company image for external benefits (Wagner, 2007; Karapetrovic and Casadesús, 2009; Santos et al., 2011; Simon et al., 2012a, 2012b; Crowder, 2013; Simon and Douglas, 2013; Abad et al., 2014; Rebelo et al., 2014) and increased organizational efficiency for internal ones (Wagner, 2007; Karapetrovic and Casadesús, 2009; Santos et al., 2011; Simon et al., 2011, 2012a, 2012b; de Oliveira, 2013; Simon and Douglas, 2013). The former is an external benefit related to the market, obtained from an internal decision, as in the empirical research, studies show that the decision to integrate is internal in the great majority of cases (see e.g., Simon et al., 2011). The latter summarizes the ‘global organization’ dimension and is one of the main outputs of integrating MSs that is built up with optimization of resources (Salomone, 2008; Santos et al., 2011; Simon et al., 2011; Abad et al., 2014; Rebelo et al., 2014), better and easier communications system (Karapetrovic and Casadesús, 2009; Santos et al., 2011; Simon et al., 2012a, 2014; de Oliveira, 2013; Abad et al., 2014), and costs reduction (Santos et al., 2011; Simon et al., 2011, 2014; Rebelo et al., 2014), among others. If resources are shared and duplication of effort is avoided (Douglas and Glen, 2000; Zeng et al., 2005; Karapetrovic and Casadesús, 2009; Santos et al., 2011), it is easier to be more efficient managing the system. This is also in line with the use of synergy effects, as the common elements are implemented in a shared manner. Several authors, such as Karapetrovic and

Willborn (1998a, 1998b), Douglas and Glen (2000), Rocha et al. (2007), and Karapetrovic and Casadesús (2009), have found that simultaneously managing systems benefit the related synergies.

Following the analysis by dimensions, the most highlighted benefits related to 'human resources' are training (Salomone, 2008; Santos et al., 2011; Holm et al., 2014), employees' involvement (Karapetrovic and Casadesús, 2009; Simon et al., 2012a; Abad et al., 2014; Rebelo et al., 2014) and team work (Curkovic et al., 2005; Hamidi et al., 2012; Holm et al., 2014). This result was expected, according to the existing literature, due to the fact that employees are related to difficulties encountered during the integration process (see e.g., Zutshi and Sohal, 2005; Karapetrovic et al., 2006; Zeng et al., 2007, 2011; Asif et al., 2009; Bernardo et al., 2012b; Simon et al., 2012a).

Increasing performance (Wagner, 2007; Tari et al., 2010; Santos et al., 2011; Hamidi et al., 2012) is the most highlighted benefit in the 'performance' dimension, followed by the improved quality of products and/or services (de Oliveira, 2013; Abad et al., 2014).

The dimension labeled 'MSs' joints the benefits related to MSs implemented and integrated. The simplification achieved in the process lead to less confusion, redundancy, conflicts in documentation and bureaucracy (Salomone, 2008; Karapetrovic and Casadesús (2009); Santos et al., 2011; Simon et al., 2011; Hamidi et al., 2012; Sampaio et al., 2012; Abad et al., 2014; Rebelo et al., 2014). Better definition of management responsibilities and authority is also an important benefit (Salomone, 2008; Santos et al., 2011; Sampaio et al., 2012; Rebelo et al., 2014).

Regarding 'audits' dimension, it is both internal and external. Internally, the unification of audits (Salomone, 2008; Santos et al., 2011; Rebelo et al., 2014), as well as better use of their results (Simon et al., 2012a, 2012b; Simon and Douglas, 2013) are the most highlighted, while externally, it is to perform integrated external audits (Salomone, 2008; Karapetrovic and Casadesús, 2009; Rebelo et al., 2014). Joint audits means that the auditors are multifunctional and can audit the IMS as a single system (see Douglas and Glen, 2000; Krauss and Grosskopf, 2008; Bernardo et al., 2010; Simon et al., 2011). Other studies have shown the importance of integrated external audits, such as Wilkinson and Dale (1998), who analyzed five certification bodies and found none publishing the benefits of an IMS, or Wright (2000), who mentioned that the English certification body was performing integrated external audits and found costs reduced by a third. In Karapetrovic and Willborn (1998b), the authors claimed that external audits should be integrated at a higher level than the internal ones, although the empirical studies show that the contrary is the case. According to some studies such as Bernardo et al. (2011b) and Simon and Douglas (2013), audit systems' integration is the aspect least integrated. Future research on this dimension is needed to analyze the evolution and improvement of this aspect.

Externally, benefits are related to the market, as the improvement of image and sustainability components that according to Rebelo et al. (2014), means that quality is no longer a source of competitive advantage and is the starting point for a business. Benefits are also related to stakeholders both relationships and satisfaction improvements (Simon et al., 2012a; Rebelo et al., 2014). Thus, when organizations decide to integrate their MSs they achieve a better internal efficiency related to a more efficient management of multiple MSs as well as improving the external image and relationship with stakeholders.

Comparing the benefits reported in the existing literature, when companies managed separately MS standards (see Table 1) and as a unique system (see Table 3), those companies that integrate their MSs get more benefits than if they keep them separated (in line with Ansoff's rule, 1965). Inevitably there are common benefits as the function-specific MSs are the same. These benefits are:

- d Efficiency, measured by cost savings, shorter lead times, optimization of resources, improved management control and better communication (Gotzamani and Tsiotras, 2002; Casadesús and Karapetrovic, 2005; Simon et al., 2011; de Oliveira, 2013)
- d Improved customer satisfaction (Gotzamani and Tsiotras, 2002; Casadesús and Karapetrovic, 2005; Martínez-Costa et al., 2008), and improvement of data collection and feed-back (Crowder, 2013)
- d Improvements in employee results measured by motivation, satisfaction, teams, communication and knowledge, among others (Gotzamani and Tsiotras, 2002; Pan, 2003; Casadesús and Karapetrovic, 2005; Karapetrovic and Casadesús, 2009; Abad et al., 2014; Rebelo et al., 2014)
- d Improvement in systematization by improved documentation, work procedures, clarity of work and improvement in responsibilities (Gotzamani and Tsiotras, 2002; Schylander and Martinuzzi, 2007), more agile system with less redundancy (Karapetrovic and Casadesús, 2009), simplified MSs resulting in less confusion, redundancy and conflicts in documentation (Salomone, 2008; Karapetrovic and Casadesús, 2009; Santos et al., 2011; Sampaio et al., 2012), and reduction of bureaucracy (Salomone, 2008; Hamidi et al., 2012; Rebelo et al., 2014)
- d Market share (Casadesús and Karapetrovic, 2005; Rebelo et al., 2014)
- d Improved image (Karapetrovic and Casadesús, 2009; Santos et al., 2011; Simon and Douglas, 2013; Abad et al., 2014; Rebelo et al., 2014)
- d Improvement in competitive position/competitive advantage (Gavronski et al., 2008; Abad et al., 2014)
- d Improved relationships with suppliers, authorities and other stakeholders (Gotzamani and Tsiotras, 2002; Casadesús and Karapetrovic, 2005; Gavronski et al., 2008; Rebelo et al., 2014)
- d Improved quality in product/service (Gotzamani and Tsiotras, 2002; de Oliveira, 2013; Abad et al., 2014)
- d Increased performance (Gavronski et al., 2008; Wagner, 2007; Tarí et al., 2010; Hamidi et al., 2012)

The main difference is the scope of the benefits impact, i.e., analyzing Tables 1 and 3 the benefits when these standards are managed separately are more focused on specific functions than in the case of integration, when the scope is the entire organization and synergies among the different MSs are applied (see e.g., Rocha et al., 2007). In order to evidence the extent of the impact, empirical research is needed analyzing both types of management.

## 5. Discussion and conclusions

The purpose of this paper was to determine the benefits of integration by comparing them with the benefits obtained through ISO 9001 and ISO 14001 standards. First, the benefits most analyzed by researchers concerning ISO 9001 and ISO 14001 are improved efficiency profitability, customer satisfaction, relationship with staff, and image. Nevertheless, only some certified firms do better than non-certified firms regarding financial performance. As pointed out in the previous section, both for ISO 9001 and for ISO 14001, studies can be found that show no impact on financial performance.

Therefore, although the standards do create internal and external benefits and many of them have a positive effect on people, operational issues, and stakeholders, the relationship between these standards and financial performance is not as clear (see e.g., Sampaio et al., 2009).

Second, organizations that integrate their MSs benefit from the improvement in efficiency arising from costs savings, better internal organization, etc., and improvement of image. The MSs management is also more efficient and integrated audits both internal and external are found significant.

Third, comparing the MSs benefits regarding the way they are managed, the integration of MSs allow achieving more benefits than if they are managed separately based on the scope of the integration impact, wider than managed separately. This result is in line with the importance of implementing right the multiple management systems as this could lead to achieve better integration benefits.

Similarly, some differences can be suggested regarding the financial benefits. While studies examining the two standards separately do analyze the effects of the standards on financial performance (e.g. market share, sales), very few studies on the effects of IMSs do so.

Several scholars show that more internally motivated firms have seen better performance outcomes, for both internal and external performance, both for ISO 9001 (Jones et al., 1997; Lee, 1998; Singels et al., 2001; Boiral and Roy, 2007; Martínez-Costa et al., 2008) and for ISO 14001 (Boiral and Sala, 1998; Kitazawa and Sarkis, 2000; Rondinelli and Vastag, 2000). This indicates that certification in and of itself can lead to some 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 internalized, there is an increased likelihood of attaining the benefits listed, including the financial ones. In this context some studies are needed to expand and clarify the few previous studies on internalization.

In addition, some studies of the ISO 9001 or ISO 14001 standard examine the selection effect. In the case of financial benefits, this involves determining whether implementation of the standards leads to an improvement in financial benefits (treatment effect) or whether, on the contrary, it is precisely those firms with relative financial benefits above the sector average that are most likely to obtain certification (selection effect). In this respect, there is a number of studies in the field of the ISO 9001 standard (Heras et al., 2002; Dick et al., 2008) which show the existence of both effects.

Nevertheless, these issues (the role of reasons for certification, internalization, and the selection effect), which have been analyzed in some studies on ISO 9001 or ISO 14001, have not been investigated in the case of IMSs.

#### *5.1. Agenda for future research*

Based on these ideas, several proposals for future research on IMSs can be suggested:

To consider other performance variables such as financial measures (e.g. market share and sales) to better explain the benefits of IMSs and to supplement previous studies on IMSs. It will give the chance to confirm if there are financial performance benefits, a variable showing different results in studies analyzing the standards separately.

To analyze the motives for IMSs and/or the level of internalization of both standards jointly. According to the results obtained, several organizations report improvement of

organization's image. This could lead organizations to decide to implement an IMS for external reasons and the existent dichotomy of internal/external reasons for separate standards could also be applied for IMS. The relationship between these motivations and (1) the internalization level and (2) the performance could be also analyzed.

- To examine the selection effect, ¿do companies with better performance levels find easier implementing an IMS?
- To analyze the IMS implementation and benefits not only considering the top management or responsible manager, but other stakeholders such as the employees. Other conditionings of the integration process that could be analyzed are the sector and size of the organization and the integration strategy and methodology.
- To compare the performance of those organizations integrating and those not integrating to measure the competitive disadvantage of the latter.

## References

- Abad, J., Dalmau, I., Vilajosana, J., 2014. Taxonomic proposal for integration levels of management systems based on empirical evidence and derived corporate benefits. *J. Clean. Prod.* 78, 164e173.
- Abraham, M., Crawford, J., Carter, D., Mazotta, F., 2000. Management decisions for effective ISO 9000 accreditation. *Manag. Decis.* 38 (3), 182e193.
- AENOR, 2005. UNE 66177 Sistemas de gestión. Guía para la integración de los sistemas de gestión. Asociación Española de Normalización y Certificación, Madrid, Spain.
- Al-Tuwaijri, S., Christensen, T., Hughes, K., 2004. The relations among environmental disclosure, environmental performance, and economic performance: a simultaneous equations approach. *Accounting, Organ. Soc.* 29, 447e471.
- Ann, G., Zailani, S., Wahid, N., 2006. A study on the impact of environmental management system (EMS) certification towards firms' performance in Malaysia. *Manag. Environ. Qual.* 17, 73e93.
- Ansoff, I., 1965. *Corporate Strategy*. McGraw Hill Inc., US.
- Arauz, R., Suzuki, H., 2004. ISO 9000 performance in Japanese industries. *Total Qual. Manag. Bus. Excell.* 15 (1), 3e33.
- Asif, M., Bruijn, E., Fisscher, O., Searcy, C., Steenhuis, H., 2009. Process embedded design of integrated management systems. *Int. J. Qual. Reliab. Manag.* 26 (3), 261e282.
- Barla, P., 2007. ISO 14001 certification and environmental performance in Quebec's pulp and paper industry. *J. Environ. Econ. Manag.* 53, 291e306.
- Beckmerhagen, I., Berg, H., Karapetrovic, S., Willborn, W., 2003. Integration of management systems: focus on safety in the nuclear industry. *Int. J. Qual. Reliab. Manag.* 20 (2), 210e228.
- Benner, M.J., Veloso, F.M., 2008. ISO 9000 practices and financial performance: a technology coherence perspective. *J. Oper. Manag.* 26, 611e629.
- Bernardo, M., Casadesus, M., Karapetrovic, S., Heras, I., 2009. How integrated are environmental, quality and other standardized management systems? An empirical study. *J. Clean. Prod.* 17 (8), 742e750.
- Bernardo, M., Casadesus, M., Karapetrovic, S., Heras, I., 2010. An empirical study on the integration of management system audits. *J. Clean. Prod.* 18 (5), 486e495.
- Bernardo, M., Casadesus, M., Karapetrovic, S., Heras, I., 2011a. Relationships between the integration of audits and management systems: an empirical study.



TQM J. 23 (6), 659e672.

Bernardo, M., Simon, A., Gotzamani, K., Casadesús, M., 2011b. La dimensió n geogr áfica de la integraci ó n de sistemas de gestió n. In: XI Congreso Nacional de ACEDE, Barcelona. Septiembre 2011.

Bernardo, M., Casadesús, M., Karapetrovic, S., Heras, I., 2012a. Integration of standardized management systems: does the implementation order matter? Int. J. Oper. Manag. 32 (3), 291e307.

Bernardo, M., Casadesus, M., Karapetrovic, S., Heras, I., 2012b. Do integration difficulties influence management system integration levels? J. Clean. Prod. 21 (1), 23e33.

Boiral, O., Roy, M.J., 2007. ISO 9000: integration rationales and organizational impacts. Int. J. Oper. Prod. Manag. 27, 226e247.

Boiral, O., Sala, J.M., 1998. Environmental management: should industry adopt ISO 14001. Bus. Horizons 41, 57e64.

Braun, B., 2005. Building global institutions: the diffusion of management standards in the world economy e an institutional perspective. In: Alvstam, C.G., Schamp, E.W. (Eds.), Linking Industries across the World. Ashgate, London, pp. 3e27.

Briscoe, J.A., Fawcett, S.E., Todd, R.H., 2005. The implementation and impact of ISO 9000 among small manufacturing enterprises. J. Small Bus. Manag. 43 (3), 309e330.

BSI, 2012. PAS 99 Specification of Common Management System Requirements as a Framework for Integration. British Standards Institution, London, UK.

Can~o n, J., Garce's, C., 2006. Repercusi ó n econó mica de la certificaci ó n medioambiental ISO 14001. Cuad. Gest. 6, 45e62.

Casadesús, M., Gime'nez, G., 2000. The benefits of the implementation of the ISO 9000 standard: empirical research in 288 Spanish companies. TQM Mag. 12 (6), 432e441.

Casadesús, M., Karapetrovic, S., 2005. Has ISO 9000 lost some of its lustre? A longitudinal impact study. Int. J. Oper. Prod. Manag. 25 (6), 580e596.

Casadesús, M., Gime'nez, G., Heras, I., 2001. Benefits of ISO 9000 implementation in Spanish industry. Eur. Bus. Rev. 13 (6), 327e335.

Chow-Chua, C., Goh, M., Wan, T.B., 2003. Does ISO 9000 certification improve business performance? Int. J. Qual. Reliab. Manag. 20 (8), 936e953.

Corbett, C.J., 2006. Global diffusion of ISO 9000 certification through supply chains. Manuf. Serv. Oper. Manag. 8, 330e350.

Corbett, C.J., Kirsch, D.A., 2001. International diffusion of ISO 14000 certification. Prod. Oper. Manag. 10, 327e342.

Corbett, C.J., Montes-Sancho, M.J., Kirsch, D.A., 2005. The financial impact of ISO 9000 certification in the United States: an empirical analysis. Manag. Sci. 51 (7), 1046e1059.

Crowder, M., 2013. Quality standards: integration within a bereavement environment. TQM J. 25 (1), 18e28.

Curkovic, S., Sroufe, R., Melnyk, S., 2005. Identifying the factors which affect the decision to attain ISO 14000. Energy 30, 1387e1407.

Dansk Standard, 2005. DS 8001 Ledelsessystemer e Vejledning i opbygning af et integreret ledelsessystem (Copenhagen, Denmark).

de Oliveira, O.J., 2013. Guidelines for the integration of certifiable management systems in industrial companies. J. Clean. Prod. 57, 124e133.

Dick, G.P.M., Heras, I., Casadesús, M., 2008. Shedding light on causation between ISO 9001 and improved business performance. Int. J. Oper. Prod. Manag. 28 (7), 687e708.

Douglas, A., Glen, D., 2000. Integrated management systems in small and medium enterprises.

Total Qual. Manag. 11 (4), 686e690.

Fink, A., 2009. Conducting Research Literature Reviews: from the Internet to Paper. Sage.

Gavronski, I., Ferrer, G., Paiva, E., 2008. ISO 14001 certification in Brazil: motivations and benefits. J. Clean. Prod. 16, 87e94.

Gotzamani, K.D., Tsiotras, G.D., 2002. The true motives behind ISO 9000 certification. Their effect on the overall certification benefits and long term contribution towards TQM. Int. J. Qual. Reliab. Manag. 19 (2), 151e169.

Hamidi, N., Omidvari, M., Meftahi, M., 2012. The effect of integrated management system on safety and productivity indices: case study; Irania cement industries. Saf. Sci. 50, 1180e1189.

Hart, C., 1998. Doing a Literature Review. Sage.

Heras, I., Dick, G.P.M., Casadesús, M., 2002. ISO 9000 registration's impact on sales and profitability. A longitudinal analysis of performance before and after accreditation. Int. J. Qual. Reliab. Manag. 19 (6), 774e791.

Hillary, R., 2004. Environmental management systems and the smaller enterprise. J. Clean. Prod. 12, 561e569.

Holm, T., Vuorisalo, T., Sammalisto, K., 2014. Integrated management systems for enhancing education for sustainable development in universities: a memetic approach. J. Clean. Prod. <http://dx.doi.org/10.1016/j.jclepro.2014.03.048>.

Huang, F., Chen, Y.T., 2002. Relationships of TQM philosophy, methods and performance: a survey in Taiwan. Ind. Manag. Data Syst. 102, 226e234.

ISO, 2008. The Integrated Use of Management System Standards. International Organization for Standardization, Geneva, Switzerland.

ISO, 2013. The ISO Survey of Certifications. International Organisation for Standardization, Geneva, Switzerland.

Jones, R., Arndt, G., Kustin, R., 1997. ISO 9000 among Australian companies: impact of time and reasons for seeking certification on perceptions of benefits received. Int. J. Qual. Reliab. Manag. 14 (7), 650e660.

Karapetrovic, S., 2002. Strategies for the integration of management systems and standards. TQM Mag. 14 (1), 61e67.

Karapetrovic, S., 2003. Musings on integrated management systems. Meas. Bus. Excell. 7 (1), 4e13.

Karapetrovic, S., Casadesús, M., 2009. Implementing environmental with other standardized management systems: scope, sequence, time and integration. J. Clean. Prod. 17 (5), 533e540.

Karapetrovic, S., Willborn, W., 1998a. The system's view for clarification of quality vocabulary. Int. J. Qual. Reliab. Manag. 15 (1), 99e120.

Karapetrovic, S., Willborn, W., 1998b. Integration of quality and environmental management systems. TQM Mag. 10 (3), 204e213.

Karapetrovic, S., Willborn, W., 1998c. Integrated audit of management systems. Int. J. Qual. Reliab. Manag. 15 (7), 694e711.

Karapetrovic, S., Casadesús, M., Heras, I., 2006. Dynamics and Integration of Standardized Management Systems. An Empirical Study. Documenta Universitaria. GITASP 1, Girona, Spain.

Karapetrovic, S., Casadesús, M., Heras, I., 2010. What happened to the ISO 9000 lustre? an eight-year study. Total Qual. Manag. 21 (3), 245e267.

Kaynak, H., 2003. The relationship between total quality management practices and their effects on firm performance. J. Oper. Manag. 21, 405e435.

King, A., Lenox, M., 2002. Exploring the locus of profitable pollution reduction.

Manag. Sci. 48, 289e299.

Kitazawa, S., Sarkis, J., 2000. The relationship between ISO 14001 and continuous source reduction programs. *Int. J. Oper. Prod. Manag.* 20, 225e248.

Kraus, J., Grosskopf, J., 2008. Auditing integrated management systems: considerations and practice tips. *Environ. Qual. Manag.* 18 (2), 7e16.

Labodova, A., 2004. Implementing integrated management systems using a risk analysis based approach. *J. Clean. Prod.* 12 (6), 571e580.

Lee, T.Y., 1998. The development of ISO 9000 certification and the future of quality management: a survey of certification firms in Hong Kong. *Int. J. Qual. Reliab. Manag.* 15, 162e177.

Link, S., Naveh, E., 2006. Standardization and discretion: does the environmental standard ISO 14001 lead to performance benefits? *IEEE Trans. Eng. Manag.* 53, 508e519.

Lo, L.K., Chang, D.S., 2007. The difference in the perceived benefits between firms that maintain ISO certification and those that do not. *Int. J. Prod. Res.* 48 (5), 1881e1897.

Lo, C.K.Y., Yeung, A.C.L., Cheng, T.C.E., 2011. Meta-standards, financial performance and senior executive compensation in China: an institutional perspective. *Int. J. Prod. Econ.* 129, 119e126.

Magd, H., Curry, A., 2003. An empirical analysis of management attitudes towards ISO 9001:2000 in Egypt. *TQM Mag.* 15 (6), 381e390.

Marimón, F., Casadesús, M., Heras, I., 2010. Certification intensity level of the leading nations in ISO 9000 and ISO 14000 standards. *Int. J. Qual. Reliab. Manag.* 27 (9), 1002e1020.

Marimón, F., Llach, J., Bernardo, M., 2011. Comparative analysis of diffusion of the ISO 14001 standard by sector of activity. *J. Clean. Prod.* 19 (15), 1734e1744.

Martínez-Costa, M., Martínez-Lorente, A.R., Choi, T.Y., 2008. Simultaneous consideration of TQM and ISO 9000 on performance and motivation: an empirical study of Spanish companies. *Int. J. Prod. Econ.* 113, 23e39.

McAdam, R., McKeown, M., 1999. Life after ISO 9000, an analysis of the impact of ISO 9000 and total quality management on small businesses in Northern Ireland. *Total Qual. Manag.* 10 (2), 229e241.

Melnyk, S., Sroufe, R., Calantone, R., 2003. Assessing the impact of environmental management systems on corporate and environmental performance. *J. Oper. Manag.* 21, 329e351.

Mendel, P.J., 2006. *The Making and Expansion of International Management Standards: the Global Diffusion of ISO 9000 Quality Management Certificates*. Oxford University Press, New York.

Miles, M., Covin, J., 2000. Environmental marketing: a source of reputational, competitive, and financial advantage. *J. Bus. Ethics* 23, 299e311.

Mokhtar, M.Z., Muda, M.S., 2012. Comparative study on performance measure and attributes between ISO and non-ISO certification companies. *Int. J. Bus. Manag.* 7, 185e193.

Moneva, J., Ortas, E., 2010. Corporate environmental and financial performance: a multivariate approach. *Ind. Manag. Data Syst.* 110, 193e210.

Naveh, E., Marcus, A.A., 2004. When does the ISO 9000 quality assurance standard lead to performance improvement? Assimilation and going beyond. *IEEE Trans. Eng. Manag.* 51, 352e363.

Nield, K., Kozak, M., 1999. Quality certification in the hospitality industry: analyzing the benefits of ISO 9000. *Cornell Hotel Restaur. Adm. Q.* 40, 40e45.

Padma, P., Ganesh, L., Rajendran, C., 2008. A study on the ISO 14000 certification and

organizational performance of Indian manufacturing firms. *Benchmarking: An Int. J.* 15, 73e100.

Pan, J.-N., 2003. A comparative study on motivation for and experience with ISO 9000 and ISO 14000 certification among Far Eastern countries. *Ind. Manag. Data Syst.* 103 (8), 564e578.

Parast, M.M., Adams, S.G., Jones, E.C., 2011. Improving operational and business performance in the petroleum Industry through quality management. *Int. J. Qual. Reliab. Manag.* 28 (4), 426e450.

Poksinska, B., Dahlgaard, J., Eklund, J., 2003. Implementing ISO 14000 in Sweden: motives, benefits and comparisons with ISO 9000. *Int. J. Qual. Reliab. Manag.* 20, 585e606.

Potoski, M., Prakash, A., 2005. Covenants with weak swords: ISO 14001 and facilities' environmental performance. *J. Policy Anal. Manag.* 24, 745e769.

Psomas, E.L., Fotopoulos, C.V., 2009. A meta analysis of ISO 9001:2000 research - findings and future research proposals. *Int. J. Qual. Serv. Sci.* 1 (2), 128e144.

Rebelo, M.F., Santos, G., Silva, R., 2014. A generic model for integration of quality, environment and safety management systems. *TQM J.* 26 (2), 143e159.

Rocha, M., Searcy, C., Karapetrovic, S., 2007. Integrating sustainable development into existing management systems. *Total Qual. Manag. Bus. Excell.* 18 (1), 83e92.

Rodríguez-Escobar, J.A., González-Benito, J., Martínez-Lorente, A.R., 2006. An analysis of the degree of small companies' dissatisfaction with ISO 9000 certification. *Total Qual. Manag. Bus. Excell.* 17 (4), 507e521.

Rondinelli, D., Vastag, G., 2000. Panacea, common sense, or just a label? The value of ISO 14001 environmental management systems. *Eur. Manag. J.* 18, 499e510.

Russo, M., 2009. Explaining the impact of ISO 14001 on emission performance: a dynamic capabilities perspective on process and learning. *Bus. Strategy Environ.* 18, 307e319.

SAI Global, 1999. AS/NZS 4581 Management System Integration e Guidance to Business, Government and Community Organizations (Sydney, Australia).

Salomone, R., 2008. Integrated management systems: experiences in Italian organizations. *J. Clean. Prod.* 16 (16), 1786e1806.

Sampaio, P., Saraiva, P., Rodrigues, A.G., 2009. ISO 9001 certification research: questions, answers and approaches. *Int. J. Qual. Reliab. Manag.* 26 (1), 38e58.

Sampaio, P., Saravaia, P., Domingus, P., 2012. Management systems: integration or addition? *Int. J. Qual. Reliab. Manag.* 29 (4), 402e424.

Santos, G., Mendes, F., Barbosa, J., 2011. Certification and integration of management systems: the experience of Portuguese small and medium enterprises. *J. Clean. Prod.* 19 (17e18), 1965e1974.

Schylander, E., Martinuzzi, A., 2007. ISO 14001 e experiences, effects and future challenges: a national study in Austria. *Bus. Strategy Environ.* 16, 133e147.

Simon, A., Douglas, A., 2013. Integrating management systems: does the location matter? *Int. J. Qual. Reliab. Manag.* 30 (6), 675e689.

Simon, A., Bernardo, M., Karapetrovic, S., Casadesus, M., 2011. Integration of standardized environmental and quality management systems audits. *J. Clean. Prod.* 19 (17e18), 2057e2065.

Simon, A., Karapetrovic, S., Casadesus, M., 2012a. Difficulties and benefits of integrated management systems. *Ind. Manag. Data Syst.* 112 (5), 828e846.

Simon, A., Karapetrovic, S., Casadesus, M., 2012b. Evolution of integrated management systems in Spanish firms. *J. Clean. Prod.* 23 (1), 8e19.

Simon, A., Yaya, L.H.P., Karapetrovic, S., Casadesus, M., 2014. An empirical analysis of the integration of internal and external management system audits. *J. Clean. Prod.* 66, 499e506.

Singels, J., Ruefl, G., van de Water, H., 2001. ISO 9000 series certification and performance. *Int. J. Qual. Reliab. Manag.* 18 (1), 62e75.

Singh, P.J., 2008. Empirical assessment of ISO 9000 related management practices and

performance relationships. *Int. J. Prod. Econ.* 113, 40e59.

Singh, P.J., Feng, M., Smith, A., 2006. ISO 9000 series of standards: comparison of manufacturing and service organisations. *Int. J. Qual. Reliab. Manag.* 13 (2), 122e142.

Tan, L., 2005. Implementing ISO 14001: is it beneficial for firms in newly industrialized Malaysia? *J. Clean. Prod.* 13, 397e404.

Tari, J., Molina-Azorin, J., 2010. Integration of quality management and environmental management systems. Similarities and the role of the EFQM model. *TQM J.* 22 (6), 687e701.

Tari, J.J., Claver-Cortes, E., Pereira-Moliner, J., Molina-Azorin, J.F., 2010. Levels of quality and environmental management in the hotel industry: their joint influence on firm performance. *Int. J. Hosp. Manag.* 29 (3), 500e510.

Tarí, J.J., Molina-Azorín, J.F., Heras, I., 2012. Benefits of the ISO 9001 and ISO 14001 standards: a literature review. *J. Ind. Eng. Manag.* 5 (2), 297e322.

Terziovski, M., Samson, D., Dow, D., 1997. The business value of quality management systems certification. Evidence from Australia and New Zealand. *J. Oper. Manag.* 15, 1e18.

Wagner, M., 2007. Integration of environmental management with other managerial functions of the firm: empirical effects on drivers of economic performance. *Long. Range Plan.* 40, 611e628.

Wahba, H., 2008. Does the market value corporate environmental responsibility? an empirical examination. *Corp. Soc. Responsib. Environ. Manag.* 15, 89e99.

Wilkinson, G., Dale, B.G., 1998. System Integration: the views and activities of certification bodies. *TQM Mag.* 10 (4), 288e292.

Wilkinson, G., Dale, B., 1999. Integrated management systems: an examination of the concept and theory. *TQM Mag.* 11 (2), 95e104.

Wilkinson, G., Dale, B., 2000. Management system standards: the key integration issues. *Proc. Inst. Mech. Eng.* 214, 771e780.

Wright, T., 2000. IMS e three into one will go!: the advantages of a single integrated quality, health and safety, and environmental management system. *Qual. Assur. J.* 4 (3), 137e142.

Yin, H., Schmeidler, P., 2009. Why do standardized ISO 14001 environmental management systems lead to heterogeneous environmental outcomes. *Bus. Strategy Environ.* 18, 469e486.

Zaramdini, W., 2007. An empirical study of the motives and benefits of ISO 9000 certification: the UAE experience. *Int. J. Qual. Reliab. Manag.* 24 (5), 472e491.

Zeng, S., Tam, C., Tam, V., Deng, Z., 2005. Towards implementation of ISO 14001 environmental management systems in selected industries in China. *J. Clean. Prod.* 13, 645e656.

Zeng, S., Shi, J., Lou, G., 2007. A synergetic model for implementing an integrated management system: an empirical study in China. *J. Clean. Prod.* 15 (18), 1760e1767.

Zeng, S., Xie, X., Tam, C., Shen, L., 2011. An empirical examination of benefits from implementing integrated management systems (IMS). *Total Qual. Manag. Bus. Excell.* 22 (2), 173e186.

Zutshi, A., Sohal, A., 2005. Integrated management system: the experiences of three Australian organizations. *J. Manuf. Technol. Manag.* 16 (2), 211e232.