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THE EFFECTIVENESS OF ISO 14001 AND ENVIRONMENTAL MANAGEMENT SYSTEM – THE CASE OF NORWEGIAN FIRMS

EFEKTYWNOŚĆ ISO 14001 I SYSTEMU ZARZĄDZANIA ŚRODOWISKIEM – PRZYPADEK FIRM NORWESKICH

Abstract

Organizations use standards to help them manage their activities to comply with regulations and help prevent, mitigate, and control adverse environmental impacts. ISO 14001 is an international standard for environmental management that provides a framework for addressing these responsibilities. The purpose of this study was to examine the relationship between the organization's primary motivation for the adoption of ISO 14001 and the value creators perceived through the implementation of the Environmental Management and Business Management Standard. The study used the data from the International Organization for Standardization 2013 ISO 14001 Continuous Improvement Survey and the survey results of the participants. It used an existing theoretical model and attempts to improve understanding of how contextual factors influence the outcomes of the ISO 14001 system. The descriptive results are consistent with the statements in the literature that external pressure and stakeholder legitimacy are the main causes for the introduction of ISO 14001.

Keywords: Environmental Management, Environmental Management System, Organizational management, ISO 14001

Streszczenie

Organizacje wykorzystują normy w celu pomocy w zarządzaniu ich działaniami, tak aby stosować się do regulacji i pomóc zapobiegać, łagodzić skutki i kontrolować niekorzystne wpływy środowiska. 14001 jest normą międzynarodową nt. zarządzania środowiskiem, która zawiera narzędzia do wypełnienia tych celów. Zadaniem niniejszej pracy było zbadanie zależności między podstawową motywacją danej organizacji do przyjęcia ISO 14001 a postrzeganą wartością, związaną z wprowadzeniem Zarządzania Środowiskowego i Standardem Zarządzania Biznesowego. W pracy wykorzystane dane Międzynarodowej Organizacji Normalizacyjnej: „2013 ISO 14001 Continuous Improvement Survey" i wyników badań uczestników. Wykorzystano istniejący, teoretyczny model i próby zrozumienia, jak czynniki kontekstowe wpływają na wyniki wg ISO 14001. Wyniki opisowe są zgodne z danymi literaturowymi, że głównie presja zewnętrzna i interesariusze wpływają na wprowadzenie ISO 14001.

Słowa kluczowe: zarządzenie środowiskiem, system zarządzanie środowiskiem, zarządzanie organizacyjne, ISO 14001

1. INTRODUCTION

Environmental management is a branch of organizational management that focuses on managing and controlling an organization's impacts on the environment and related issues in the surrounding community. Global economic growth and increased consumption, without parallel developments in environmental resource management, have intensified global environmental degradation in recent decades (Sinding, 2000). Industrial environmental management has become increasingly critical, yet increasingly challenging due to transnational industrial networks, environmental impacts that transcend localised borders and boundaries, and limitations of traditional, state-based environmental regulations.

Environmental management systems are a systematic approach to environmental management that ultimately aims to improve the environmental performance of a business. Environmental management systems (EMSs) have evolved at national and international level as decentralized, voluntary environmental programs as a result of economic globalization and increasing external

pressure on businesses in environmental matters (Levy and Dinopoulos, 2016). The International Organization for Standardization's ISO 14001 standard has become dominant in this area due to its widespread adoption and acceptance in the industry. As a policy tool, ISO 14001 has been praised for transcending regulatory borders and close gaps in international environmental governance, enhancing environmental performance on a global scale, reduce environmentally-related information asymmetry, and facilitate trade. It has also been criticized as a private-sector vehicle for green-washing (Coglianese & Nash, 2002; Raines, 2006), and as a costly and administratively-burdensome scheme that is only suitable for large organizations (Van Der Veldt, 1997). Research suggests that it can add value to organizations and produce positive environmental performance results, yet as a process-based standard, ISO 14001 provides no such guarantees.

2. LITERATURE REVIEW
2.1. Environmental management

Environmental management is a misunderstanding: it is said that the retention of control over the environment is meant by name, while realistically only ways can be found to manage human interactions with the environment considering natural systems and environmental conditions. Within the profession of environmental management, this means managing the impact of man and industry on the environment – ultimately managing institutions and people, with a measurable outcome in environmental performance, in conjunction with the impact of an organization on the natural environment (Peng, 2014; Krut & Gleckman, 1998, Morelli, 1999).

Environmental management has also evolved from its inception into a profession, from a more isolated, reactive and ad hoc role, focused on ensuring regulatory compliance and pollution control, to a more proactive preventive function, embedded in the organization and integrated into the business processes and responding to stakeholder concerns (Peng, 2014; Greenwood, Rosenbeck and Scott, 2013). Although regulatory compliance management and environmental know-how remain an important issue, the profession focuses more on environmental sustainability and corporate social responsibility (Bootsma & Vermeulen, 2011, Greenwood et al., 2013).

Environmental management has been recognized in modern organizations as "partially professionalized practices" (Lippert et al., 2015), with competence

expectations regarding education, professional certifications and environmental knowledge for entry or progress in this area. In 2016, the Association for the Development of Sustainability in Higher Education (AASHE) included in its academic program database at least 318 courses related to environmental management in business, economics, engineering, law, science, global studies, education, geography and urban planning disciplines (AASHE, 2016). Friedman (1992) argues that technicians before and in the early days of the environmental movement mainly dealt with environmental issues in the industry, as this was considered unimportant. As a result of the environmental change, environmental management has gained increasing attention in the business context, and by the early 1990s, at least 25 business schools had included environmental issues in their curricula (Friedman, 1992).

2.2. Environmental Management System

An environmental management system (EMS) is a systematic and structured approach for the prevention, mitigation and control of the adverse environmental consequences of an organization's activities, products, and services (see Figure 1). It involves a formalized set of processes for planning, implementation, monitoring and review of an organization's activities aimed at delineating how an organization will manage its impacts on the environment and those who depend on it, and at improving an organization's overall environmental performance (Daddi et al., 2011; Fiorino, 2004, 2006; Mazurek, 2004; Sroufe et al., 1998).

Fig. 1. EMS Model for Continual Improvement (adapted from Duijm et. al. 2008)

Environmental performance is based on measurable results related to affected environmental conditions, such as air or water quality, as well as conditions and indicators relative to the organization, such as reductions in emissions and releases, or consumption of energy.

Performance relative to the EMS can also relate to management activities that can influence environmental performance, such as environmental awareness, training, and competency development (ISO, 2013b).

Management systems target what Hansen (2006) refers to an as transactional and transformational change in an organization. Transaction changes are reflected in initiatives that change organizational roles, process systems, and administrative practices. Transformational changes are revealed at a higher level through changes in corporate culture, values, and leadership. For example, environmental management systems include setting organizational goals and goals, as well as changing environmental performance rules and procedures that represent transactional changes. Management systems also involve internal policy-setting, leadership commitments and responsibilities, and establishing processes for employee education and awareness, and internal and external communication. The resulting manifestation of leadership and accountability, along with flows of environmental management information can ultimately shape pro-environmental behavior and change organizational culture, representing transformational change (Greenwood, 2010; King, Lenox, & Terlaak, 2005). Some studies suggest that the quality of the EMS and thus the extent to which an organization can leverage its EMS toward transformational change depends on the organization's internal characteristics and structure, its motivations for adoption, and the extent to which it internalizes the EMS (Deepa Aravind & Christmann, 2008; Balzarova & Castka, 2008; M. Delmas & M. W. Toffel, 2004; Gonzalez-Benito & Gonzalez-Benito, 2008; Qi, Zeng, Li, & Tam, 2012).

2.3. Standards for environmental management system

Levy and Dinopoulos, (2016) describe standards as a behavioral measure and expectation of authority. According to Mitchell (2003), the adoption of a standard implies "the agreement to be bound by the established measures" (page 432). According to the 1995 National Technology Transfer and Advancement Act (NTTAA), this includes design-specific technical specifications and the corresponding rules of conduct for management systems. Management system standards are management standards for the design and management of aspects of organizations (Furusten, 2000; Heras-Saizarbitoria & Boiral, 2013). They are meta-standards because they do not require particular requirements for a task or product but contain a set of design rules that apply to broad processes or disciplines

(Boiral, 2001, Uzumeri, 1997). Meta-standards are basic requirements, such as: Which subsystems are required, but in the case of management system standards, users can determine how they are operationalized in the context of the organization (Corbett & Yeung, 2008, Endres, 2010, Uzumeri 1997).

An EMS standard aims to institutionalize responsible management of environmental impacts in the business by embedding it in the organization's routines and operating patterns, including its environmental commitments, responsibilities, and resource allocations as well as its procedures, processes, and daily activities (Anon, 2002; Coglianese and Nash, 2002; Qi et al., 2012). It is a component of the organization's overall management strategy that enhances the organization's understanding of its effects and interactions with the environment (Morelli, 1999). Qi et al. (2012) describe this process of embedding the values and attitudes of the organization in their management and culture as "internalization".

2.4. ISO standards

ISO 14001 is ISO's core, foundational environmental management standard. Consistent with the missions of ISO and ISO/TC 207, ISO 14001 is intended to aid organizations in recognizing, managing and improving their interactions with the environment, and to enhance communication and recognition of environmental aspects and information across borders (ISO/TC207, 2013; Van Der Veldt, 1997). The standard was first published in 1996 and is arguably the world's leading standard for environmental management systems due to its worldwide acceptance and recognition. More than 325,000 organizations, including businesses, communities, service organizations and faith communities in 170 countries, have independent ISO 14001 certification, and it is estimated that many other organizations, including government agencies, adopt the standard without undergoing certification (ISO, 2014, ISO / TC207, 2013). In the United States, over 6500 organizations held ISO 14001 certification, covering just over 6900 physical sites, as of 2014 (ISO, 2014). After 20 years since ISO 14001's introduction, it remains a contested issue as to whether or not the Standard can fulfil its promise of environmental performance improvement. ISO 14001 sets rules for environmental management system design and development in firms but does not prescribe specific operations, product requirements, or environmental performance targets to be achieved (Eng Ann, Zailani, & Abd Wahid, 2006; Uzumeri, 1997).

ISO 14001 outlines the requirements for setting up, implementing and maintaining a system to achieve environmental goals and manage environmental impacts within an organization, addressing organizations of all types, sizes and geographic locations. The intended outcomes of ISO 14001 include meeting legal and other organizational requirements and improving environmental performance. Many Norwegian companies have adopted the international standard ISO 14001 for environmental management systems as an instrument for achieving environmental management, sustainability and social responsibility (2015).

The standard describes the required characteristics and subsystems of an EMS as a foundation for continual improvement, whereby adopting organizations have considerable flexibility in determining how to develop the system adequately and effectively within the specified framework. An adopting organization must implement environmental policy, objectives, and planned actions that address its unique set of environmental impacts and legal and other environmental requirements, and they must monitor and measure the system's effectiveness, identify and solve problems, and conduct reviews aimed at improving the system. It is based on the Deming-Shewhart Plan-Do-Check-Act (PDCA) model for continual improvement. Figure 2 provides an overview of the significant components of ISO 14001.
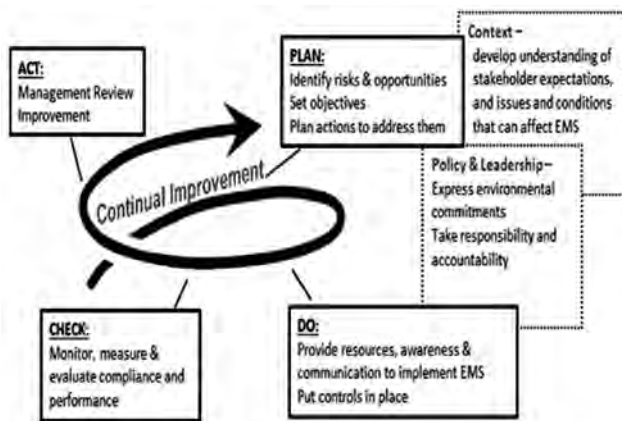

Fig. 2. ISO 14001 System Components (adapted from Duijm et. al. 2008)

An organization has flexibility in the goals it sets and how it implements the Standard; however, it also has the responsibility to establish and pursue its goals within the context of applicable legal requirements and performance standards, as well as relevant environmental commitments and stakeholder concerns.

2.5. Effect of the organization's motivation for ISO 14001

The first section of the study focuses on the relationship between the organization's primary motivations for implementing ISO 14001, and the level of value added that users perceive when implementing the environmental management and management standard. Under an ISO 14001 framework, organizations can differ significantly in the ambitiousness of the objectives they set and in their environmental performance outcomes (Brouwer & van Koppen, 2008; Coglianese & Nash, 2002; Nawrocka & Parker, 2009). Institutional theory offers possible insights on firm motivations for adopting ISO 14001 as a driver that produces variability in EMS performance-related outcomes.

The body of literature on ISO 14001 suggests several important internal and external drivers for its adoption that correspond well to the motivations identified in ISO's 2013 Continual Improvement Survey. These include external pressures and mandates from customers, regulators, and parent companies (Andrews et al., 2003; M. A. Delmas & M. W. Toffel, 2004; Morrow & Rondinelli, 2002; Perkins & Neumayer, 2010; Tung et al., 2014); internal motivations related to environmental risk reduction, improving public image, cost savings, and integration with other management standards (Andrews et al., 2003; M. A. Delmas & M. W. Toffel, 2004; Florida & Davison, 2001; Morrow & Rondinelli, 2002); and normative internal motivations related to environmental protection and conservation (Daddi et al., 2011; Bansal and Roth, 2000).

Some motivations are oriented in environmental responsibility and driven by values and ethics, including the firm's commitment to environmental protection and conservation. Some may be determined by perceived internal efficiency and economic benefits, including cost savings, financial interests, and opportunities for integration with other management standards adopted by the organization, such as quality systems, occupational safety and health systems, energy management, or social responsibility. Different motivations are based on external pressures or the need for strategic or stakeholder legitimacy. Survey participants were asked to rank the following factors that influenced their adoption of ISO 14001 in order of importance:
- public image,
- customer requirement,
- government/regulatory agency requirement,

- commitment to environmental protection and conservation,
- reduction of risk related to adverse environmental impact,
- cost savings/financial benefit, and
- ways to integrate with other management standards applied by the organization (such as ISO 9001, ISO 50001, ISO 26000, OHSAS 18001).

3. METHODOLOGY

This study applied mixed methods including analysis of secondary data from ISO's 2013 ISO 14001 Continuous improvement survey followed by open, semi-structured interviews with respondents to examine how contextual factors such as motivation, size, and EMS maturity can affect the environmental and business value of ISO 14001. Survey data were analyzed using linear regression to examine relationships among user motivations, organization size, and the age of the EMS, and the nature and extent of value users gained from ISO 14001 implementation. Interviews with survey participants were used to follow up on survey responses and collect qualitative data. The methodology provides background on the ISO Survey, describes the research methods and models used in the research, and includes demographic information on survey and interview participants.

3.1. The ISO 14001 survey

In 2013, ISO and the British Standards Institute (BSI) surveyed ISO 14001 users and other interested parties to gain understanding and collect data for continual improvement of the Standard including user motivations for implementing ISO 14001. The benefits of implementation realized by users regarding the nature and extent of the value they gained, and perspectives of users and interested parties concerning potential incorporation of a selection of sustainability and social responsibility concepts identified as future challenges for environmental management (Greenwood, 2013). Response formats included multiple choice, ranking, and Likert-scale ratings, as well as open text comments relative to each major section of the questionnaire.

The survey generated close to 5000 responses in 110 countries, with 54% of responses current, past and potential users, 17% of organizations that have no interest in implementation, mainly from consulting firms or certification bodies, and 29% from other interested parties, including consultants,

examiners and scientists. In Norway alone, there were 230 responses, of which 140 (61%) were current or former users of ISO 14001. Other answers came from consultants, certification bodies and researchers who were interested in the standard but had not implemented it. The survey was accessible for three months on ISO's website, and recruitment was accomplished through ISO publications, certification body and consultancy communications to affiliates, and through national survey leaders appointed by ISO's national member bodies (NMBs). Within Norway, the survey leaders worked through the Norwegian Accreditation, which serves as administrator for Norwegian NMB, to recruit participants. Norwegian Accreditation disseminated the survey information and provided access to the questionnaire through its April 2013 issue of Quality Progress and its online Knowledge Centre (Norwegian Accreditation, 2013) and issued recruitment emails to TAG 104 members in March 2013 (Admussen, 2013). The Norwegian Accreditation Board, which oversees accreditation of ISO 14001 certification bodies and auditors in Norway, also issued a recruitment communique to its affiliates in March 2013.

3.2. Semi-structured interviews

In addition to data collection and quantitative conclusions based on the ISO Survey, this study included qualitative research based on interviews of Norway survey participants to follow up on their responses and provide broader perspectives on the dynamics and extent of value gained from ISO 14001 implementation, including contributing factors and constraints. The quantitative results were used to guide the qualitative research, and while the survey analysis provided answers and insights on the surface, the interviews allowed for a complete picture and offered a broader view into what was going on "on the ground" in ISO 14001 implementation, and why.

Open-ended, semi-structured interviews were conducted with ISO 14001 users in Norway who completed the survey questionnaire, agreed to be contacted regarding their responses, and agreed to participate further in the study. Fifty of the 140 Norway participants provided contact information for possible follow-up and were approached by email for recruitment. Nineteen survey participants continued more also in the study as interview subjects, representing 38% of those providing contact information. Interviews were conducted July – September 2018.

3.3. Model

For analytical purposes, factor choices were classified according to Bansal and Roth's (2000) model of environmental responsiveness, as primarily related to (1) environmental responsibility; (2) competitiveness; or (3) external pressure and legitimacy (legitimation). Bansal and Roth's model of corporate ecological responsiveness classifies firms' initiatives to reduce adverse impact on the environment based on their underlying motivations: completeness, legitimacy, or social responsibility. Under this model, firms motivated by competitiveness undertake environmental initiatives for the sake of improving long-term profitability and competitive advantage, framing environmental initiatives as business opportunities that will yield higher profits or lower costs through improved eco-efficiency (Bansal and Roth, 2000).

Following Bansal and Roth's model, the primary motivations indicated in the ISO Survey related to a business opportunity or cost efficiency benefits were classified under competitiveness. Motives associated with providing legitimacy or credibility with stakeholders were categorized under legitimation, using Suchman's terminology, which addresses actions aimed at gaining, maintaining, or defending legitimacy, from strategic and institutional perspectives (Deephouse & Suchman, 2008; Suchman, 1995). Those oriented in environmental values or ecological ethics were classified under environmental responsibility, equivalent to Bansal and Roth's characterization of social responsibility. Table 1 indicates the classification of motivations for adopting ISO 14001 from the ISO Survey, based on Bansal and Roth's model.

Table 1. Organizational Motivations for Adopting ISO 14001 – Adapted from Bansal and Roth (2000)

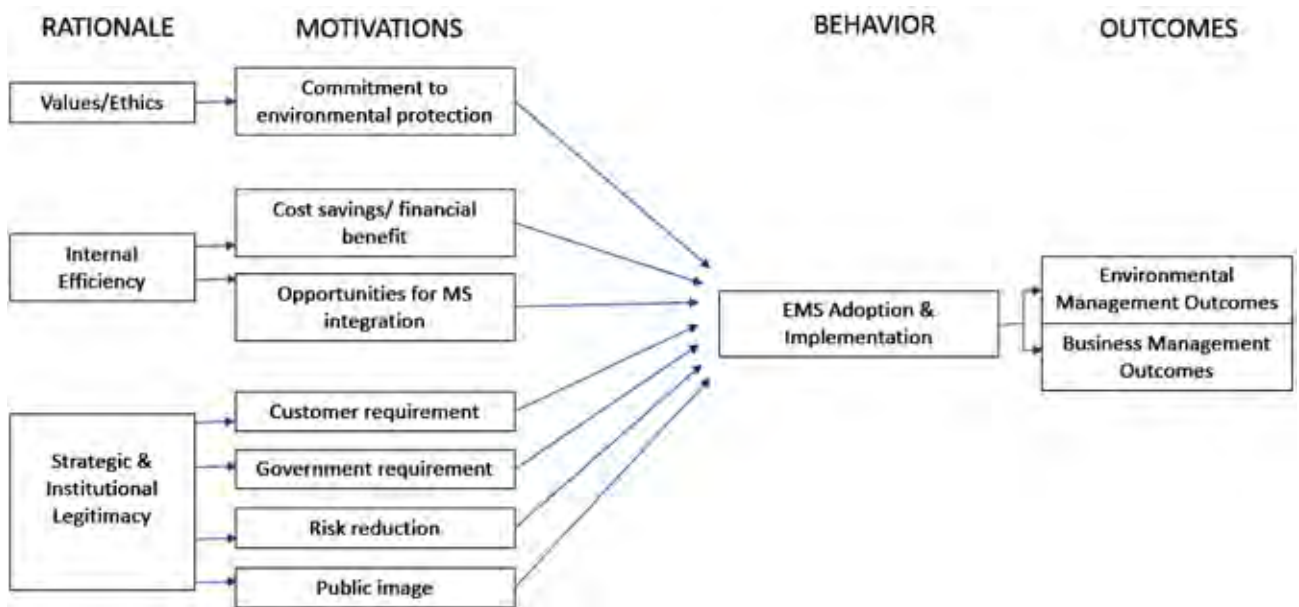| Motivations for ISO 14001 Adoption		
Environmental Responsibility (Normative, ethical)	Competitiveness (Internal benefit)	Legitimation (Pressure legitimacy)
Rationale: It is the right thing to do and supports firm values	Rationale: Provides economic opportunity or business strategy	Rationale: Provides legitimacy or credibility with stakeholders
• Commitment to environmental protection and conservation	• Cost savings/financial benefit • Opportunities for integration with other management standards applied by the organization	• Customer requirement • Government/regulatory agency requirement • Public image • Reduction of risk related to adverse environmental impact

Fig. 3. Research Model – Motivations for ISO 14001 Adoption and Effects on EMS Outcomes (Adapted from Bansal and Roth, 2000)

The EMV and BMV results were then compared, respectively, among these motivation classifications using linear regression to determine whether the nature of the organization's primary motivation for adoption was a significant driver of the degree of value users gained. Figure 3 illustrates the research model based on user motivations for adopting ISO 14001.

4. FINDING

From an institutional point of view, this section of the study examines the relationship between the primary motivations of an organization for the introduction of ISO 14001 and the benefits they derive from implementation. To what extent does the primary motivation of an organization for the introduction of ISO 14001 influence the value that they gain in the context of environmental management and the value they generate regarding business management?

The institutional theory suggests that organizations with external pressure and legitimacy-related motivation receive less value through the introduction of ISO 14001 than their partners with more internal motives. Overall, the findings suggest that Norwegian firms are gaining significant value for corporate management and environmental management through the introduction of ISO 14001, but are not deciding whether the motivation for adoption is a strong determinant. While companies that implemented ISO 14001 primarily under legitimacy pressure consistently indicated a lower implementation value than companies with environmental responsibility or competitiveness motivation, statistical analysis did not openly support the relationship between motivation and generally derived business management value. Participant interviews provided insights into the complexity behind an organization's motivation to adopt ISO 14001, as well as the involvement of management as a critical factor in EMS outcomes.

Simon (1956) applied the term "satisficing" as a decision-making approach that involves choosing an option that is "good enough" rather than optimal, especially when faced with multiple, potentially conflicting goals. At least in the short term, the costs of satisficing are perceived to be lower than the costs of optimizing (Winter, 2000), and firms may have incentives for taking actions that are strategically beneficial in some way but aren't optimal in other ways (Dixon, 2001). Taken with neo-institutional perspectives, this suggests that an organization's

motivation for implementing an EMS will have a direct effect on its outcomes. A firm with coercive or legitimacy-driven motives for adopting ISO 14001 may be more likely to opt for ceremonial or symbolic implementation as a means to meet its legitimacy needs while deciding not to internalize the EMS within its daily operations fully.

Hart (1995) maintains that business strategy will increasingly need to account for interactions with the natural environment and be based on capabilities that support environmentally sustainable activities. Effective EMS implementation hinges on top management support and employee competency and engagement related to operations that can have a significant impact on the environment, and a ceremoniously implemented system is likely to be weak in these areas. Despite the increasing need to establish and internalize effective systems for environmental management, legitimacy-seeking, ceremonious adopters are less likely to improve the nature of their interactions with the environment significantly, compared to those with more internally-driven or normative motivations.

4.1. Results for motivation and ISO 14001 values

Survey Analysis

The descriptive results are consistent with the statements in the literature that external pressure and stakeholder legitimacy are the main causes for the introduction of ISO 14001. Around 63% of respondents said that factors in this category had the most significant impact on their performance Introduction of ISO 14001. The relationship between motivation and the level of corporate governance gained through the introduction of ISO 14001 showed that companies motivated primarily by external pressure and legitimacy contributed 5.6% to company's Environmental responsibility and a value 11.1% lower than companies with motives indicated internal competitiveness. Regarding environmental management value, companies motivated by external pressure and legitimacy were 4.2% lower in value than companies motivated by environmental responsibility and 11.2% lower in value than companies driven by internal environmental performance Competitiveness were motivated.

However, the results for both EMV and BMV were not statistically significant, based on the input variables of interest at $\alpha = .05$. So, while there may be less EMS value associated with exogenous motivations, given

the overlap in confidence intervals for the means for each motivation type, there was no conclusive evidence to support the research hypotheses. The detailed results and the p-value results for value-motivation significance tests are shown in Table 2. Boxplots of the motivation type vs summed EMV and BMV results are shown in Figure 4.

Semi-structured Interview Results

The results of the interviews indicated that ISO 14001 provides added value to environmental management and employee engagement in environmental management, reduction and control of adverse environmental impacts, and environmental compliance. Participants indicated that improving the impact and ensuring compliance was primarily due to the infrastructure provided by the Standard for Consistency, Continuity and Visibility, including standardized procedures and processes, and a structured and organized approach Way to plan the environmental aspects of an organization and tackle activities.

This is consistent with survey results for individual environmental value variables. The top four items that participants indicated as areas where ISO 14001 implementation provided environmental management value were as follows:

- management commitment to environmental management,
- environmental performance improvement,
- ability to meet legal requirements, and
- Employee engagement.

Around 90% of respondents said that implementing ISO 14001 for these individual factors is at least a moderate value. Besides, 73% indicated that commitment to environmental management was high to very high, 67% stated that the improvement in environmental performance was strong to very high, and 65% was high to very high for regulatory compliance and 58% High value was a too high value for employee engagement. Figure 5 shows the overall survey results for each of the factors that make up the environmental management value variable.

Table 2. Motivations vs ISO 14001 Value Gained Descriptive Results and Significance

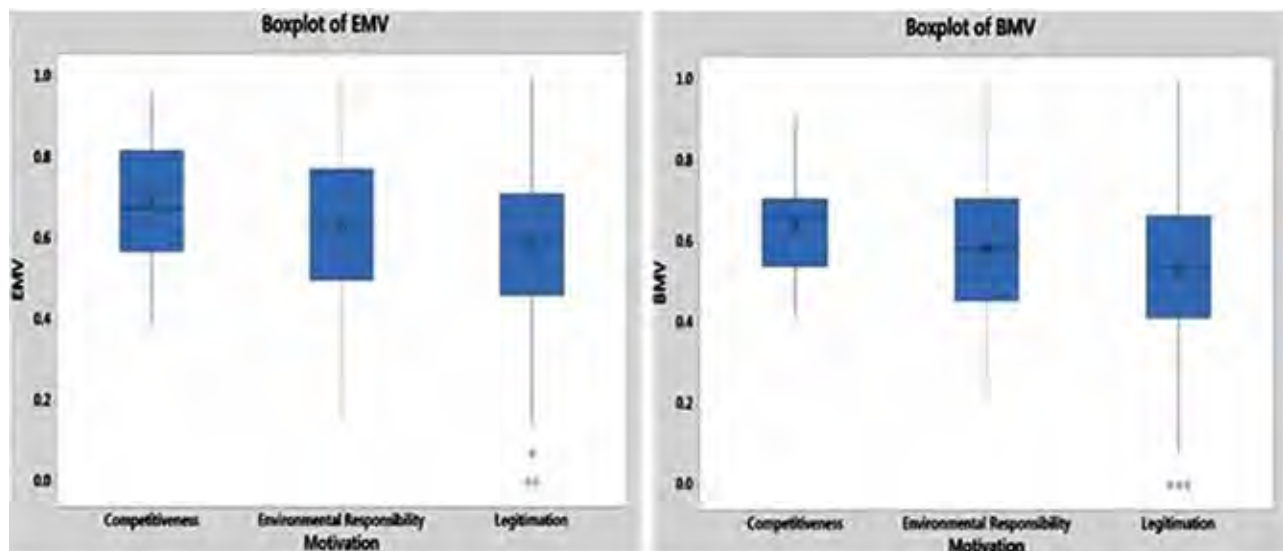| Motivation		N	Mean	St. Dev.	p-value
EMV	Internal Competitiveness	9	0.6944	0.1742	0.421
	Environmental Responsibility	88	0.6246	0.1801	
	External Pressure/Legitimacy	162	0.5825	0.2037	
BMV	Internal Competitiveness	9	0.6435	0.1399	0.226
	Environmental Responsibility	88	0.5885	0.1791	
	External Pressure/Legitimacy	162	0.5321	0.2141	

Fig. 4. Main Effect Boxplots of Motivation vs. Summated EMV and BMV

Interview participants also noted systematic and structural benefits concerning business management. ISO 14001 provided an underlying structure for consistency, continuity, and succession, which helped organizations to avoid disruption related to environmental risk management and legal compliance and facilitated the achievement of strategic objectives. Several participants felt that the environmental management benefits they realized had in turn provided tangible value for business management, regarding reduced costs through pollution prevention, and improved efficiency from the integration of environmental management processes with related business processes. However, participants who indicated that management in their organizations had not embraced ISO 14001 and was mostly doing the minimum needed to maintain certification suggested that the only business management value from the Standard was related to customer retention or public image. Compared to the responses to the overall survey, achieving the strategic goals and meeting stakeholder requirements was the single highest value of corporate value added, with over 80% of respondents reporting at least a modest score and
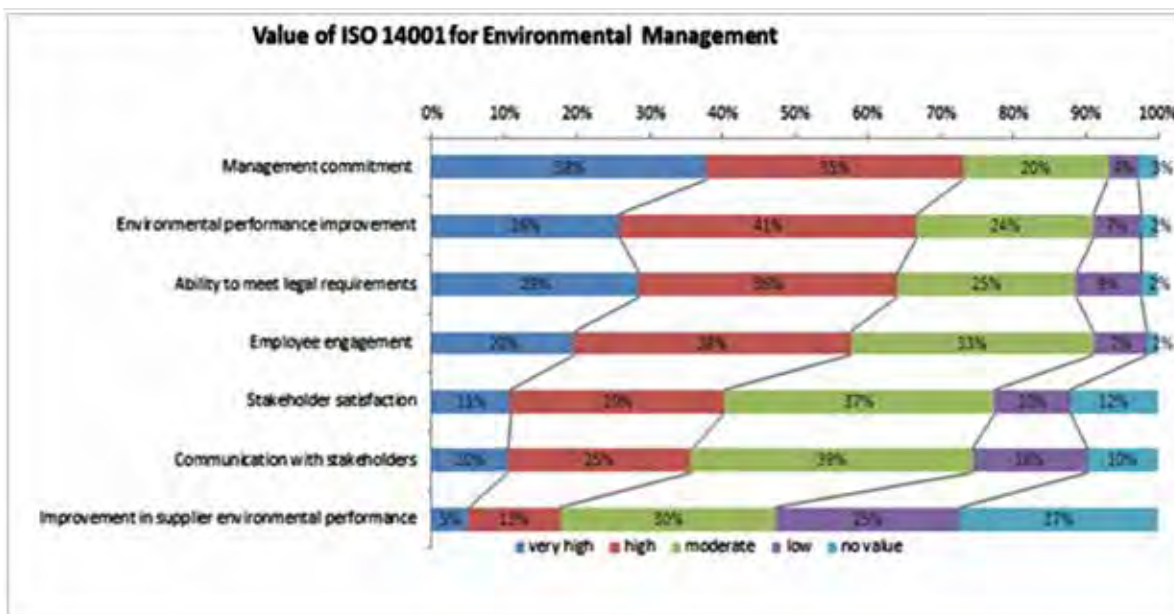

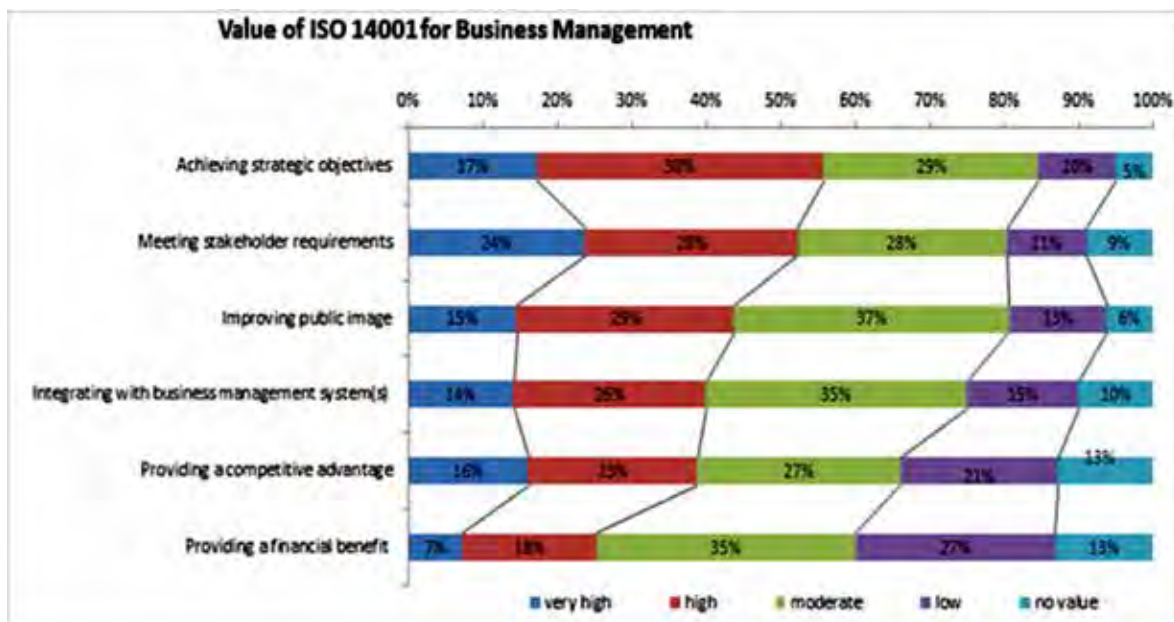*Fig. 5. Survey Results for Individual Variables Comprising the EMV Super Variable*

Fig. 6. Survey Results for Individual Factors that Comprise the BMV Super Variable

over 50% a very high score. The image of the public improved, with 80% at least moderate and 44% high to very high. Then integration with business systems, with 75% being at least moderate and 40% high to very high. Figure 6 shows the survey results for individual factors that make up the overarching variable Business Management Value.

Interview participants representing organizations with environmental responsibility or internal competitiveness-oriented motivations consistently indicated that upper management in their organizations had embraced the EMS and used it actively to control their processes and activities with environmental impacts. For organizations motivated by external pressures and mandates, there was more variation in the extent that management accepted and utilized the EMS. One participant described a disconnect where under a mandated approach, upper management wasn't committed to the implementation of the EMS, at least initially, which affected the implementation of the system and limited its value to the organization. In several cases, management's "eyes were opened" to the potential value of the EMS once it was in place and began to leverage it more as an opportunity, even though they were initially pressured to adopt it (5, 18, 9, 11, 16, 7). In others, management accepted the EMS but didn't fully integrate it or take full advantage of its opportunities. The EMS was described in several cases as a "bolt-on" system. Some organizations were just going through the motions, doing the absolute minimum needed to maintain certification (1, 3, 10, 12, 15), or worse, "gaming the system" as one participant (10) suggested, by outsourcing processes with significant environmental impact (9) or purposely setting weaker, less specific goals and seeking out less rigorous certification auditors to facilitate the audit process.

5. DISCUSSION

The Value of ISO 14001 for Environmental Management

Value perceptions appear to be affected by the organization's complexity and level of environmental impact. Interview results suggest that firms with higher complexity or environmental risk tended to find higher value overall in ISO 14001 implementation than those with lower complexity or environmental impact. This also relates to cost-benefit trade-offs, where value or benefits obtained would need to surpass the costs associated with conformity and certification for a firm to recognize it as such.

When asked to elaborate on areas where ISO 14001 had added value for environmental management, many of the interview participants discussed improvement in meeting environmental legal requirements, waste minimization, and environmental performance improvement. While some participants indicated environmental performance and compliance assurance might have also been influenced by other programs and initiatives in their organizations, they all observed the systematic approach provided by ISO 14001 to be instrumental toward those ends. It enabled proactive processes to gain knowledge, identify and address situations that could have resulted in noncompliance with environmental regulations, and solve and prevent problems by identifying underlying causes. ISO 14001 provided the discipline to establish, document, and standardize procedures, and a structured, organized and cohesive way to plan for and address the environmental aspects of the organization's activities.

The second area, highlighted by many participants, was the involvement of management and employees in environmental management issues. ISO 14001 further strengthens environmental management in the organization. Management has been informed about environmental management activities and concerns as well as the functioning of the system as part of the required management review process. Over time, this improved leadership in environmental management and managers began to find more ways to improve environmental protection, achieve environmental goals, and reduce costs. This was a factor responsible for organizations motivated by environmental responsibility, as well as several who were invited or urged to adopt ISO 14001.

Besides, employee awareness and engagement in environmental management activities and issues was noted as a major area of value for several organizations. Employee involvement in the EMS helped to provide much more comprehensive environmental protection because employees began to think about how their work affected the environment and how they could contribute toward the organization's environmental goals. ISO 14001's requirements for employee awareness and competence made employees part of the process and provided a more robust opportunity for individuals within the company to do the right thing when making decisions.

These results are consistent with Rondinelli and Vastag's (2000) case study research, which indicated

positive behavior changes as a result of ISO 14001 implementation and highlighted their importance in driving reductions in waste generation. Managers noted an increase in awareness of environmental issues, impacts, and requirements, as well as personal responsibilities at work as a result of the EMS. Implementation of the Standard, or at least a robust EMS, can produce critical behavioral impacts that contribute to better environmental performance, even for sites already performing well beforehand.

The Value of ISO 14001 for Business Management

Regarding business management value, participants again mostly noted systematic and structural benefits, where ISO 14001 provided an infrastructure for consistency, continuity, and succession, and helped the organization to avoid disruption related to environmental risk management and compliance assurance. The structure and action plan established under the EMS supported and facilitated the achievement of strategic objectives.

Participants who indicated that management in their organizations had not embraced ISO 14001 and mostly doing the minimum needed to maintain certification suggested that the only business management value from the standard was related to customer retention or public image. One participant noted that the standard was viewed as merely a marketing expense. Various participants kept in mind that business and environmental management go together. Besides, environmental management benefits would, in turn, provide value for business management, noting specific benefits realized in reduced cost associated with pollution prevention efforts, improved efficiency as a result of integrating the EMS within the business systems, and enhanced product-related environmental management and stewardship in relation to meeting rules and directives in international markets.

6. CONCLUSIONS

This study is based on perceptions of value, which are inherently subjective and context-dependent, and firms are looking to get different things out of the EMS based on different motivations and organizational contexts. Perceived value tends to increase with higher levels of organizational complexity or environmental risk, and the more the EMS outcomes align with the organization's goals and core processes. Further, a value can often be intangible in environmental management. It's easy to see where you fail, but hard to see success regarding what's prevented, and this affects perceptions of value.

Even organizations that "do the right thing" in implementing an EMS for all the "wrong" reasons may over time broaden the scope of their intentions due to changing perceptions, internal culture, and enhanced capabilities. Regarding ISO 14001 environmental and enterprise value management indicators, it may, therefore, be more appropriate to examine the attitudes and perceptions of senior management, as well as the organization's inclination to engage in environmental management and integrate the EMS into the overall business.

Motivation is an important, but complex factor in driving environmental and business management value for ISO 14001 users. This research overall suggests that motivation does matter, but there is variability in what happens over time, after the decision is made to adopt ISO 14001, and this variability in implementation can lead to disparate performance results and perceptions of value gained in the process. Human and economic factors, including upper management awareness of an emphasis on environmental issues and EMS activities, organizational culture, and availability of resources have a significant effect on EMS implementation and its effectiveness.

The study thus raises critical questions that revolve around what happens after the decision is made to adopt ISO 14001, and how to get upper management to embrace the EMS principles and align EMS performance outcomes with the organization's strategic goals when mandated to adopt ISO 14001. In this sense, ISO 14001 adoption may be something of an arranged marriage for many firms. They can keep the EMS at arm's length, accepting it but underutilizing it under a transactional approach, or they may realize its value once it is in place and embrace it, integrating it into daily operations and leveraging it for transformational change.

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