

AN INTERNATIONAL COMPARISON OF THE FACTORS AFFECTING ENVIRONMENTAL STRATEGY AND PERFORMANCE

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INTRODUCTION

An environmental management system (EMS) consists of internal policies, assessments, and implementation actions that affect the entire enterprise and its relationship with the natural environment. Such systems are increasingly being recognized as comprehensive mechanisms for improving environmental and business performance (Coglianese & Nash, 2001). However, little is known about the factors affect their international adoption and whether EMSs enhance a company's performance. This study draws on institutional theory and the resource-based view to evaluate when a facility's EMS improves environmental and business performance.

INSTITUTIONAL SETTING

Related to the natural environment, institutional theory suggests that regulatory, market and social pressures constrain organizations' economic activities, and create opportunities for strategic advantage (Hoffman, 2000). For example, companies that preempt costly regulations can make regulations them less relevant to them and EMS adoption may be one means of doing so. Similarly, market pressures may encourage companies to engage in proactive environmental strategies as customers have become increasingly aware of the natural environment. EMS adoption may be one way for companies to address these market pressures. Environmental accidents have increased social pressures from environmental and community groups (Hoffman, 2000), as well trade associations (King & Lenox, 2000) and labor unions. Pressures from each of these groups therefore are expected to influence whether or not a facility adopts an EMS. Other types of institutional pressure are imposed by the facility's head office (Oliver, 1997) and shareholders (Henriques & Sadorsky, 1996). Multiple facility and publicly traded companies must adhere to reporting systems whereby information and resources are transferred between the facility and the head office and vice versa. Consequently, the facility is highly dependent on the head office (Oliver, 1997) and shareholders, which may influence the decision to adopt an EMS. *H1: Institutional pressures to conform to environmental concerns increase the likelihood that a facility will develop an EMS.*

RESOURCE-BASED VIEW

Companies respond to external pressures in numerous ways based on their access to resources and complementary capabilities that have developed over time (Oliver, 1997). Prior research suggests that facilities with stronger complementary capabilities may adopt EMSs because doing so may create competitive advantage (Hart, 1995). For instance, firms with greater investments in environmental research and development (R&D) generate more knowledge-based capital, which is critical to sustained competitive advantage (Ghemawat, 1986). Similarly, quality management systems (QMS) require knowledge-based capabilities that facilitate proactive environmental management (Hart, 1995). QMSs involve coordination among large numbers of people, especially line employees, in continuous-improvement efforts and thus serve as a foundation for EMS implementation (Sarkis & Kitazawa, 2000). The same may also be true for other management systems, such as health and safety, management accounting and inventory management, since they depend upon employees' knowledge development and teamwork.

Complementary capabilities from managerial attitudes may also explain why organizations undertake particular environmental activities (Cordano & Frieze, 2000). Additionally, a facility's export orientation may facilitate its EMS adoption decision because foreign customers are often unable to monitor the environmental performance of the facility or firm (Nakamura et al. 2001). As such, export oriented organizations derive greater benefits from undertaking protective environmental actions (Nakamura et al. 2001). Consequently, we hypothesize:

H2: Acquisition of resources and capabilities which complement the development of environmental initiatives increase the likelihood that a facility will develop an EMS.

ENVIRONMENTAL AND BUSINESS PERFORMANCE

Previous institutional research has shown that participants in voluntary environmental programs have reduced their impacts to the natural environment and therefore derived premium pricing and increased sales (Rivera, 2002). EMS adoption may therefore benefit the environment and create opportunities for improved business performance.

H3a: Facilities whose environmental strategies are driven mainly by institutional pressures lead to EMS whose focus is on obtaining positive environmental performance.

Other institutional literature suggests that facilities may struggle to adopt a legitimate but difficult-to-implement environmental strategy. As such, these companies may adopt new strategies ceremonially in order to stave off institutional pressures at a more fundamental level (Meyer & Rowan, 1997). If so, EMS adoption represents a symbolic action that will not improve a facility's environmental performance.

H3b: EMS adoption decisions that are driven mainly by institutional pressures lead to EMSs that are focused on deriving positive business performance, but not positive environmental performance.

The resource-based view of the firm suggests that environmental strategies that go beyond compliance with environmental regulations are associated with improved business performance because they create valuable organizational capabilities (Hart, 1995) that must be continually improved in order to create a stream of innovations that lead to sustained competitive advantage (Sharma & Vredenburg, 1998).

H4: EMS adoption decisions that are driven mainly by resources and capabilities lead to EMSs

that are focused on obtaining positive environmental and business performance.

RESEARCH METHODS

To evaluate our hypotheses, a 12-page survey was developed in conjunction with the OECD and researchers from Canada, France, Germany, Hungary, Japan, Norway and the U.S. The survey was sent to environmental managers of manufacturing facilities with 50 employees or more in each of the seven countries. A total of 4,176 facility managers (24.7%) responded to our survey. Canada and the U.S. and Germany and Norway were chosen for our analysis.

Institutional Pressures. Regulatory pressures were assessed by asking facility managers how many regulatory inspections they received over the last 3 years. We also asked how important was the influence of public authorities on the environmental practices at their facility. Ownership pressures from the head office were determined by asking whether or not the head office was located in a foreign country (Nakamura et al. 2001), and ownership pressures from shareholders (Henriques & Sadorsky, 1996) were assessed by determining whether the facility was listed on the stock exchange. All 4 measures were combined in a factor analysis that yielded 2 factors measuring regulatory and ownership pressures.

Market pressures were measured by asking facilities how important household consumers, commercial buyers and suppliers were on the environmental practices of their facility. Societal pressures were measured by asking environmental managers whether labor unions, trade associations, environmental groups, and community groups were “not important,” “moderately important,” or “very important” to the environmental practices at their facility. All 7 measures were factor analyzed, which resulted 2 variables depicting market and social pressures.

Resources and Capabilities. We measured innovation investments by whether or not the facility had an R&D budget allocated towards environmental matters (Porter & van der Linde, 1995). To measure export orientation, we evaluated whether the facility’s market was at a local, national, regional (adjacent countries) or global level (Nakamura et al. 2001). We also assessed whether facilities had adopted 6 management systems: QMS, HSMS, full-cost/ activity-based accounting, management accounting systems or inventory/materials requirement planning. Factor analysis of these measures resulted in 2 factors, reflecting a formal management system capability (QMS and HSMS) and other management system competencies. Finally, employee and managerial commitment to the environment was determined by asking facility managers whether the influence of non-management and management employees on the organization’s environmental practices was “not important,” “moderately important,” or “very important”.

EMS Adoption. Since improving an EMSs generally requires an individual who is responsible for environmental issues (Netherwood, 1998), we assessed whether facilities had designated environmental managers. Additionally, facility managers were asked whether they had implemented an EMS, in addition to nine different environmental practices that are recognized as components of an EMS: written environmental policy; environmental criteria used in the evaluation and/or compensation of employees; environmental training program in place for employees; carry out external audits; carry out internal audits; benchmark environmental performance; environmental accounting; public environmental report; and environmental

performance indicators/goals. Facilities' practices were summed and included in a factor analysis along with the other 2 variables, creating 1 measure. We also developed a more specific EMS measure, because some companies may claim that they have an EMS, although in reality they have implemented only portions of one. We factor analyzed the nine environmental practices to create an "EMS rigor" index. As expected, the results of our factor analysis yielded 1 factor.

Environmental and Business Performance. To determine whether facilities improved their environmental performance, we asked managers whether their use of natural resources, solid waste generation, wastewater effluent, local or regional air pollution, and global pollutants had "decreased significantly," "decreased," "no change," "increased," or "increased significantly." All 5 measures were combined in a factor analysis. A facility's business performance was measured by asking environmental managers whether their profits during the last 3 years were "so low as to produce large losses," "insufficient to cover our costs," "at break even," "sufficient to make a small profit," or "well in excess of costs."

RESULTS

Hypotheses were tested using structural equation modelling. Our fit indexes showed that our model was a good approximation of the relationships we were testing. The empirical results for Canadian facilities showed a positive relationship between institutional pressures and EMS adoption (H1). Facilities that endured stronger pressures from regulators, society, and their head office/shareholders were more likely to adopt an EMS (see Table 1). However, facilities with stronger complementary resources and capabilities did not adopt an EMS more frequently than facilities that lacked these same resources and capabilities, which was contrary to H2. As such, we offer no evidence supporting H4. H3a was supported because Canadian facilities' decisions to adopt an EMS were also more likely to develop environmental strategies whose focus was on obtaining positive environmental performance. There is no support for H3b since EMS adopters had a stronger environmental performance than non-adopters.

Insert Table 1 about here

The results for Germany showed that there was a positive relationship between institutional pressures and facility environmental strategy (H1). There was also evidence showing that a facility's resources and capabilities predicted EMS adoption (H2). However, institutional pressures had less of an effect in predicting facilities' environmental strategies, as denoted by the standardized coefficients (.28 as compared to .83). These findings suggest that the positive environmental and business performance gains accrued by German facilities were related more to their robust resources and capabilities, which supports H4. As in Canada and Germany, institutional pressures predicted Norwegian facilities' EMS adoption decisions (H1). We found a positive relationship between resources and capabilities and EMS adoption (H2). Despite these strong findings, our estimations for Norway do not support H3a, 3b and 4.

Like the other countries, institutional pressures influenced US facilities' EMS adoption decisions (H1), as did the facilities' resources and capabilities (H2). These results also support H3a in that facilities whose environmental strategy were driven mainly by its institutional

pressures rather than its resources and capabilities were more likely to develop an EMS that led to positive environmental performance. In sum, H1 was supported in each of the 4 countries while H2 was confirmed in each country except Canada. H3a was supported in Canada and the USA, and H3b was not confirmed in any country. H4 was substantiated in Germany only.

DISCUSSION AND CONCLUSION

This research provides evidence that supports institutional theory and the resource-based view of the firm. Overall, a facility's institutional pressures and organizational resources and capabilities predicted whether or not they adopted an EMS and whether they subsequently derive positive environmental and business performance. However, these relationships differ by country in that facilities that move beyond responding to institutional pressures (as was the case in Germany), and focus on developing their internal competencies to address environmental concerns, are able to improve the natural environment and reap financial rewards. By contrast, facilities that are guided primarily by institutional pressures, as was the case in Canada and the U.S., improved their environmental performance but were not able to improve their business performance. One reason for these findings may be that facilities are devoting more resources to meeting, challenging or even defying the institutional forces (Oliver, 1997) rather than finding or developing capabilities to meet these environmental challenges. Our research offers no support for the idea that facilities were adopting EMSs as actions to improve business performance while not improving the natural environment. EMS adopters therefore appear sincere in their intentions to use their proactive environmental strategies to improve their environmental performance.

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Table 1: EMS Adoption Motivations and Environmental and Business Performance ^φ

Variable	Canada	Germany	Norway	USA
Motivations to Adopt an EMS				
<i>Institutional Pressures Index</i>	.69*	.28*	.32**	.74**
Regulatory pressures	.40**	.63***	.41*	--
Market pressures	--	.33***	.43**	.32**
Societal pressures	.39**	.42***	.63**	.15*
Head office pressures	.45**	.51***	--	.37**
<i>Resources & Capabilities Index</i>				
QMS/HMS	--	.83***	.54***	.67**
Other management practices	--	.40**	.41**	.45**
Employee & stakeholder support	--	.53***	--	.20**
Environmental R&D budget	--	.21***	.27**	--
Broader export orientation	--	.25***	.41**	.23**
Does EMS Predict Performance?				
<i>EMS Index</i>	1.00***	1.00***	.37	.13**
General EMS characteristics	.96***	.69***	.87***	.89***
EMS rigor	.95**	.70***	.98***	.93***
<i>Performance</i>				
Environmental performance	-.36**	-.34**	-.34*	-.50**
Business performance	--	.15**	--	--

φ Standardized coefficients are shown. Negative coefficient for environmental performance indicates that managers reported *lower impacts to the natural environment*.

*** p < 0.01, ** p < .05, * p < 0.10.