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COMPARATIVE STUDY OF FIRM PERFORMANCE: EMS ADOPTER AND NON-ADOPTER FIRMS TO ACHIEVE SUSTAINABLE BUSINESS GOALS

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ABSTRACT

The paper titled "Comparative Study of Firm Performance: This paper titled "EMS Adopter and Non-Adopter Firms to Achieve Sustainable Business Goals" analyses the impact of EMS on organisational performance, thereby measuring firms' financial, environmental and competitive performance. Hence, the research results lead to the conclusion that EMS adoption has a positive effect on environmental performance and can act as a source of competitive advantage by enhancing stakeholders' relations and market positioning. Nonetheless, while EMS can cost some firms dearly initially, and they may struggle to implement it to the best effect, others reap handsome profits and the rewards from it in the long haul; moreover, the regulatory framework affects EMS, either positively or negatively. Firms from the environments that are keen on environmental measures perform better due to compliance pressure. However, other researchers have suggested that it is possible to enhance the advantages of EMS and the efficiency of various operations across the organization by integrating the management system with other systems like quality management and occupational health and safety systems. This type of analysis has certain weaknesses, which should be taken into consideration, including: Non-availability of impartial data as most of the data collected here are self-reported, and the fact that the regulatory environments may differ across territories. Additionally, it would also be useful to extend the analysis into the successful dual employment of EMS with other sustainable initiatives. This research also has prospects in developing a clearer perception of EMS capabilities in supporting sustainable business strategies and methods that can prompt the identification of the best approaches for applying EMS in specific contexts. Therefore, its conclusions are useful for business and policy strategies to support positive change and achieve permanent economic and environmental gains. Thus, by having all the pros and cons associated with the EMS provided here, companies are in a better position in planning their implementation of EMS and the subsequent results that would be attained. Leadership policymakers can also use these findings to develop sound regulatory policies for the spread of EMS and the encourage sustainability within the business organizations.

Keywords: Environmental Management Systems (EMS), Environmental Performance, Competitive Advantage, Sustainable Development Goals, Panel Data Analysis, Generalized Method of Moments (GMM)

INTRODUCTION

In this process of corporate sustainability, EMS, especially ISO 14001, is adopted globally by firms. ISO launched ISO 14001 in 1996. Since then it has aided organisation's in choreographing their environmental responsibilities (Salim et al., 2018). Europe has embraced EMS because of the strict

environmental laws and enabling organizations. Another frequently implemented environmental standard besides ISO 14001 is EMAS that stands for the EU's Eco-Management and Audit Scheme. In their study of the European enterprises, Morrow and Rondinelli (2002) point out the fact that a number of companies adopt EMSs for legal compliance, market competitively, and respond to stakeholder pressure. An awareness of environment and strict regulations of Germany have contributed to high endorsement of ISO 14001 and EMAS standards (Kolln & Prakash, 2002). Amid the documented statistical dates, North America ranks second after Europe in their usage of the eco-friendly ISO 14001 certification. This paper reveals that the acceptance of ISO 14001 in the US is high but does not conform to regional or the market factors such as regulation regimes. The existing research has established that while the North American enterprises implement EMS, it is as a result of the market pressure and CSR, not the requirement of regulation. The adoption of innovation in Canada has since normalized due to the action of the government and market forces; (Darnall et al., 2008).

Because of the encouragement of the governments and the Environmental Management as a business imperative, ISO 14001 has been Implemented greatly in Asia particularly in china. EMS has been employed to enhance the operational processes of Chinese enterprises especially manufacturers to enhance their operations while being guided by high standards concerning the conservation of the environment. EMS has been applied in China's textile and apparel industry; however, the system has some operations and financial problems, as identified by Li & Wu (2017). Many African and Latin American poor countries have not adopted EMSs because they lack the necessary resources, awareness, and backing by institutions. These places are being compelled to adopt EMS because MNC supply chain demands it and set a higher bar than the local companies have set for themselves. EMS influences stakeholder management and organisational sustainability in Pakistani manufacturing organisations where Ikram et al., (2019) also supports the argument.

This paper explores EMS adoption globally and relates the findings to the legal environment, markets, and institutions. EMS adoption has been affected by Europe's legal structures and policies as well as its institutions. This necessary process of recycling is motivated by local incentives and corporate social responsibility in North America and Asia as a result of government legislation and globalization. The uptake of EMS globally is in line with management techniques practiced in businesses with regard to environmental conservation. The research also reveals positive correlation between certified EMS firms responding to environmental management, operations, change and improvement, stakeholders, and markets.

This paper reviews on how legal factors, market factors, and institutional factors influence the adoption of EMS in the global business. The laws and rules of Europe and other entailing institutions form the basis of EMS adoption. Recycling and usage of recyclable material must be done due to the legal requirements enforced by North American, Asian, and global laws and therefore incentive and corporate social responsibility are required. The increase in EMS deployment globally is accompanied by an ascending trend in the importance of environmental responsibility in enterprises' management. The survey indicates that organizations with certified EMS have a better experience in environmental management; Operations; Stakeholder management; and Market Status than those without certified EMS (Johnstone & Hallberg, 2020).

LITERATURE REVIEW

Further research on the influence of Environmental Management Systems (EMS) on corporate competitiveness is carried out. This section synthesises literature on how adoption of EMS influences competitiveness and performance. Listed below are Leal, Fa, and Pasola's (2003) survey of 40 Spanish enterprises regarding EMS and its competitive advantage: Specifically, their studies indicated that competition is enhanced through the use of EMS. According to the report, EMS enhance the effectiveness of companies' functioning, decrease the costs on wastes and compliance and meet the standards which provide enterprises with competitive advantages. Claver et al. (2007) also looked at the role played by environmental management on company performance in a farming cooperative called COATO. Some of the studies showed that EMS adoption positively influenced the environment and brand image and credibility of the corporations. Better stakeholder relation and effectiveness was also achieved in the cooperative

due to good management of environmental factors that assisted the cooperative in gaining competitive advantage. Delmas (2009) looked into pressures and organizations holdings in relation to ISO 14001 promotion for competitiveness. Specifically, in the study it revealed that distributors, customers, community and regulatory agencies enhanced the competitiveness of the firm's EMS. One of the key competencies that the competitors cannot easily imitate is stakeholder involvement. Competitive pressure as one of the environmental innovation strategy of firm and looked at GSBC integration. The analysis of 230 firms showed that the innovative success in the rival organizations enhances focused firms to develop incremental and radical green success. Specifically, the green supply chain integration with consumers enhanced the competitive advantage and also focused on the environmental advancement. As Yadav, Han, and Kim showed in their work, improvement of the company's environmental performance protects competitiveness. They also found that it was possible for figures of top environmental performers to keep achieving increasing profit margins. In this way, many environment al activities being associated with corporate success, especially for the organizations, which focus on the shareholder value creation. On the basis of competitive environmental tactics, Orsata (2006) categorised and found that efficiency, eco-labeling, and ISO 14001 certification can provide competitive advantage to the enterprises. Since tactics can not be assumed universal about organizations, better environmental performers use firm specific environmental initiative to create public benefit and business advantage. This study established that competition influences GSCM as analyzed by Laari, Töyli and Ojala (2017). They also found that marketing distinctiveness and using hybrid strategies, are more advanced in organizations by possessing superior GSCM procedures. The ideas assist organizations in the management of varieties and to differentiate their products and services while avoiding suppliers' environment problems. The environmental benefits of SMEs were researched by Simpson, Taylor, and Barker, in the year 2004. A vast majority of SMEs responded that they were aware of the environmental problems but regarded the compliance mainly in terms of cost. It has revealed the important role of acquiring more information aid in enabling the SMEs to capitalise on the environment initiatives. From the literature, EMS implementation may enhance the organizational performance, manage its stakeholder and its market positioning. These benefits vary with a firm's sector, size, and its environmental commitment level. Future research should look into these dynamics, including the novel contexts or organisations that haven't been researched before or are located in other regions. EMS is being accepted by organizations as a strategic weapon in which they can compete effectively. This section of the paper integrates the literature on the numerous ways through which EMS can enhance the competitiveness of a firm to denote the method and conclusion of the commencement of EMS. According to the work done by Leal, Fa and Pasola (2003), evidences from a survey targeting enterprises in Spain revealed that there is improvement in competitiveness through increased deployment of EMS. EMS implementation in the company provided the desired results showing higher organizational effectiveness, lesser waste and standard compliance resulting in increased competitiveness among the companies who adopted this system. EMS may confer competitive advantage to the organization when business and sustainability initiatives are integrated, established scholarship suggests. Albertini (2018) examined how the management control systems contribute to the development of environmental competence for competitive edge. This paper established that an Management control system that is ideal enhanced stakeholder integration, a wider acquisition of knowledge within the organization, and ensured continuous innovativeness within one example. Organizations require these characteristics in order to compete effectively with a good environmental action plan. Laari, Töyli, and Ojala tried to connect competitors strategy with green S supply chain management in year 2017. They highlighted that their investigations found out that various marketing distinctiveness and hybrid strategies were able to enhance better GSCM practices which in turn helped enhance competitiveness. Through GSCM, organisation’s are in a position to properly manage every standard to avoid the organisation's cost related to poor standards and market of distinctiveness. Self generated by the author Resource efficiency, eco labeling, and ISO 14001 certification to provide competitive advantage to enterprises claims Orsato (2006). According to the study, it was suggested that the character of the firm should dictate strategy to further economic opportunities and environmental gain. In general,

this method contributes to effective distribution of corporate funds and reaping of strategic advantage by the corporations in environmental issues. The following authors established an assessment of competitive pressure and green supply chain integration environmental innovation; Dai, Cantor, and Montabon (2015). Survey data from 230 firms report the forces from rival firms' green successes encouraging firms to adopt incremental and dramatic environmental change. Since the green supply chain integration initiatives promote environmental improvement, the advancement influences competitory success. Shares also highlight the idea that while evaluating the environmental performance and competitive advantage, surely the enterprises with better performance can sustain profits. The study also found that environmental activities are positively correlated with financial performance particularly in the organisations that lay more emphasis on the concept of shareholder value. Government can face business competitive threats through issues such as higher company margin due to environment improvement. Thus, establishing from Simpson, Taylor and Barker (2004) it held that environmental measures offered certain benefits to SMEs including competitive advantages. According to his study, the SMEs acknowledged environmental pressures but analyzed them in terms of threat as opposed to opportunity of competition. They did not know or were not facilitated to employ environmental measures to create competitive advantage. Based on this research, it can be ascertained that operational factors, stakeholder, and market factors have a positive influence on the adoption of EMS and competitiveness of organisations. These advantages are, however, industry, firm size and the degree of environmental integration specific. Thus, future research is necessary to determine how EMS can help a firm offer a competitive edge, particularly in other sectors and countries that have not been investigated extensively.

RESEARCH METHODOLOGY

Concerning the research method used in this research, this segment uses a systematic approach by identifying elements such as the unit of analysis, target population, sampling technique, and variables used in the research. This methodology will seek to employ a comprehensive methodology to establish the effect of EMS adoption on the performance of organizations while comparing both EMS adopters and non-adopters. In research methodology, therefore, the target population refers to the large population from which a study proposes to draw inferences. It is necessary to make sure that the conclusions that are proposed will be relevant and accurate in the given setting. EMS company characteristics, procedures, perceived environmental performance gains, and firm advantages are covered in this questionnaire. Validated questionnaire items from previous research of similar health habits were used, improving internal and inter-study validity. Since opinion and quantitative data must be collected simultaneously, the questionnaire includes Likert scale, interview, and yes/no questions. This approach is suitable for understanding subtle EMS implementation patterns and consequences due to its advantages. The overall sum of Likert-scale items measures environmental and competitor performance judgments, and hypothesis testing identifies differences and linkages.

ANALYSIS

Descriptive Statistics

In this section, we give a summary of the data that was collected from the companies that were using EMS and those that were not using EMS before and after the implementation of the system. Descriptive statistics provides a general view of the collected data concerning some aspects, such as measures of central tendency, variability, and distribution. From these figures, an initial impression of the nature of the data can be obtained and form a subsequent basis for the analysis. This comparison helps one to understand the pre-EMS scenario, the shift that is occasioned by the adoption of the EMS, and the comparison between the firms that have adopted the EMS and those that have not. The descriptive statistics are grouped into three categories: pre-EMS companies, post-EMS companies, and non-EMS companies. This structure makes it easy to review the data set in preparation for other analyses such as reliability, communalities, component matrix, correlation, and regression.

Table 01: Descriptive Statistics

Descriptive Statistics						
	Pre-EMS		**Post-EMS**		**Non-EMS**	
	PREP	**CAPREP**	**POEP**	**CAPOEP**	**NEEP**	**CANEEP**
N	411	411	411	411	516	516
Minimum	1	1	1	1	1	1
Maximum	5	5	4	5	5	5
Mean	3.4	3.48	2.92	2.92	3.42	4.2
Std. Deviation	0.92	0.906	0.872	0.839	0.874	0.811
Skewness	-0.048	-0.185	-0.47	-0.131	-0.391	-0.997

Reliability Statistics

In this section, we report the reliability coefficient statistics for data collected from EMS and non-EMS companies. Reliability analysis is essential since it evaluates the stability and accuracy of the tools used in the study. Positivism is aimed at ensuring that the measurements taken are accurate so that the data collected can be relied on to depict the nature of the investigated variables. To assess the reliability of the questionnaire scales, we apply Cronbach's alpha, a standard coefficient for internal consistency. This section is divided into three sub-sections, each of which presents the reliability statistics of pre-EMS, post-EMS, and non-EMS organizations. It is only possible to be confident that the instruments employed in the data-gathering process are valid and that subsequent analyses will build upon these results. The findings will show the extent to which the measurement scales used in this study are reliable across different contexts and different phases of the EMS implementation.

Table 02: Reliability Statistics

	Reliability Statistics	
	Cronbach's Alpha	**No of Items**
Pre-EMS	0.715	2
Post-EMS	0.769	2
Non-EMS	0.544	2

Correlations

This section provides a correlation analysis of EMS and non-EMS companies. Correlation analysis looks at the nature and magnitude of the straight-line relationships between two variables. Knowledge of these relationships is essential since it gives one a clue as to how different factors are related and the degree of correlation that exists between a change in one variable and that of another. Such an approach is helpful in determining essential relationships that one can use in subsequent multivariate analyses and modeling. The section is subdivided into three parts, each of which examines the correlations for pre-EMS, post-EMS, and non-EMS firms. Through these correlations, it is possible to understand how different levels of interaction between variables happen at various stages of EMS implementation and between non-EMS-adopting companies. These steps will help to improve the understanding of the interactions within and between these groups, which will form the basis for analyzing the results of subsequent research.

Table 03: Correlation Analysis

	Correlations		
		PREP	CAPREP
Pre-EMS	**PREP**	1	.556**
	CAPREP	.556**	1
		POEP	**CAPOEP**
Post-EMS	**POEP**	1	.626**
	CAPOEP	.626**	1
		NEEP	**CANEEP**
Non-EMS	**NEEP**	1	.374**
	CANEEP	.374**	1

Regression Analysis

In the following section, we provide the regression analysis for both the EMS and non-EMS companies. Regression analysis is a statistical tool that can be used to investigate the potential association between a dependent variable and one or more independent variables.

Table 04: Regression Analysis

Model Summary			
	Pre-EMS	**Post-EMS**	**Non-EMS**
Model	1	1	1
R	.556a	.374a	.626a
R Square	0.309	0.14	0.391
Adjusted R Square	0.307	0.138	0.39
Std. Error of the Estimate	0.765	0.811	0.681

			Pre-EMS		**Post-EMS**		**Non-EMS**	
			(Constant)	**CAPREP**	**(Constant)**	**CAPOEP**	**(Constant)**	**CANEEP**
Coefficients	Unstandardized Coefficients	B	1.438	0.564	1.022	0.65	1.723	0.403
		Std. Error	0.15	0.042	0.122	0.04	0.189	0.044
	Standardized Coefficients	Beta		0.556		0.626		0.374
	t		9.589	13.525	8.379	16.216	9.139	9.149
	Sig.		0.000	0.000	0.000	0.000	0.000	0.000

Discussion of Results

EMS improves firms' environmental performance. Comparing environmental indicators before and after EMS use helps measure its effectiveness in promoting sustainable management practices and minimizing environmental impact. The pre-adoption environmental performance may reflect the firm's environmental management and legal compliance at the time. Lack of EMS in any organization increases waste, pollution, and resource inefficiency. Zobel (2016) showed that ISO 14001, a common EMS standard, helped organizations manage energy and waste. Before ISO 14001, these enterprises had no environmental management system. This increased resource use and waste. Also, post-adoption changes are often drastic. Melnyk et al. (2003) found that organizations who embraced formal EMS made many waste and pollution improvements beyond regulatory standards. According to the report, EMS deployment provided a more transparent structure for environmental management, helping the business improve its environmental performance. Another study by Anton et al. (2004) found that enterprises with good EMS had decreased toxic emissions per unit of output. Thus, this study found that EMS deployment was crucial to environmental gains. Companies with well-developed and executed EMS were ahead of those without. A large cross-sectional

study by Tung, Baird, and Schoch (2014) indicated that manufacturing enterprises with EMS had superior environmental performance after implementation. EMS also helped manage pollutants, waste, and resources. The study found that ISO 14001-certified enterprises had higher costs, highlighting the importance of certification in EMS efficacy. The findings of Frondel, Krätschell, and Zwick (2018) that EMS improves environmental performance corroborated this investigation. EMS deployment improves environmental indices, according to data from over 4,000 manufacturing sites. It also showed that certified EMSs were more effective than non-certified ones, supporting certification's environmental benefits. Wang et al. 2022 found that EMS adopters had 100% better environmental performance than non-adopters. The comparison of pre- and post-adoption EMS indicators in enterprises shows an overall improvement in environmental performance. Management EMS, especially ISO 14001-compliant ones, reduces waste, pollution, and resource inefficiencies. These enhancements assist firms address environmental concerns and make business solutions more sustainable when they are environmentally and economically beneficial.

Conclusion

This paper argues and concludes that the existence of EMS results in favorable changes in firms' environmental performance. This section reviews literature by different researchers that compares and contrasts the environmental performance of companies that have implemented an EMS and those that have not. Research has also indicated that organizations that adopt EMS, such as ISO 14001, have improved environmental management performance compared to those without the standards. Wang et al. (2022) determined a significant difference in the environmental performance where EMS adopter's overall performance was twice that of the non-adopters. This disparity is rather significant and underscores EMS's ability to promote sustainable practices and improve environmental outcomes. The research also revealed that EMS-adopted establishments had improved their occupational health and safety performance; hence, EMS effectiveness is valid. Another research study by Anton, Deltas, and Khanna (2004) identified the impact of EMS quality on environmental performance. Now, they found that adopting a good EMS had led to a marked reduction in toxic emissions per production incrementally, particularly so amongst those companies with high initial levels of pollution. This indicates that EMS uptake, especially when the system is of high quality, can make a considerable contribution to reductions in emissions and, hence, an improvement of the environment. Further research should be done in the future, observing these external factors that may distort the results in order to determine the actual effectiveness of EMS. As pointed out earlier, most of the empirical research, including this study, focuses on the initial impact of EMS implementation on organizations. However, some impacts of EMS may not be visible in the short term, particularly in terms of sustainability and environmental sustainability. Such effects can be fully understood through longitudinal research designs that take time to examine organizations over the years (Campos, 2012). In conclusion, it can be noted that, with some of the advantages and disadvantages of EMS implementation highlighted in the study, these limitations underscore the need for larger, longer-term, and more rigorous research. To eliminate the above limitations in future research, EMS will be able to explain the environmental and financial performance better.

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