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Study of Firm Performance: EMS Adopter Firms to Achieve Sustainable Business Goals

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Abstract
EMS effectiveness is studied concerning financial, environmental, and competitive outcomes among corporations. A comparative analysis of Companies with EMS integrated into their management systems will be made with those Companies without EMS in this research. EMS's contribution to business sustainability is also analyzed and validated with the help of quantitative research methods including panel data using the Generalized Method of Moments (GMM) and regression analysis. The research focuses on the differences in the financial results, the positive impact on the natural environment, and competitive advantage of enterprises that voluntarily apply the EMS compared to those that do not. The findings of this study shown that EMS adoption enhance environmental performance and offer competitive advantage by enhancing stakeholder relations and market positioning. This alters the nature and benefits that organizations experience while implementing EMS as some companies initially experience cost implications and functioning challenges but in the long run, EMS brings profitability and cost-effectiveness. It may provide more information on how EMS promotes and can sustain responsible business activities and the most effective means of doing so. The above analysis may be useful to firms and policy makers in understanding how to encourage sustainability that will benefit economies and the natural environment in the long-term.
Keywords: Environmental Management Systems (EMS), Environmental Performance, Competitive Advantage, Sustainable Development Goals, Panel Data Analysis, Generalized Method of Moments (GMM)

1. Introduction

The implementation of EMS has been on the rise over the last two decades, and this has been of interest to many organizations, governments, and scholars. This interest stems from the understanding that EMS can offer significant benefits in terms of environmental performance improvement, cost reduction, enhanced company image, and market position. EMS, especially those that are certified under ISO 14001, are meant to assist organizations in effectively planning, implementing, and controlling their environmental performance, which in turn can have a positive impact on the overall business performance (Melnyk, Sroufe & Calantone, 2003). The EMS is usually deployed in order to meet the legal requirements of the environment. However, it usually takes some time before the management of most organizations comes to understand that going the extra mile can be very rewarding. They include waste minimization, resource utilization, and management of environmental impacts. For example, in a study by Watson et al. (2004), they established that EMS improves financial performance through the reduction of costs that accrue from waste management and compliance.

However, the shift from a partial EMS to a full-scale EMS is not without its problems. The authors noted that some of the challenges that companies encounter include a lack of awareness of the environmental impacts, a lack of technical know-how, and financial challenges (Testa et al., 2016). In order to address these challenges, it is necessary to focus on sustainable development and the implementation of environmental management as a part of organizational strategy. Once these barriers are understood and met, organizations often report that they experience enhancements in a number of facets of their business. For instance, the adoption of EMS by the formal organization has gone besides pollution management to other operational performance (Ushakov, Goryunova, & Shatila, 2021). They may range from compliance with the law and regulation, increase in market returns, and satisfaction of stakeholders.

Regarding the concern for EMS implementation, it reflects organizational size, industry type, and EMS deployment level. Small firms are unlikely to adopt and leverage on EMS as compared to the larger firms that can well afford to do so as indicated by Campos (2012). Yet, an organization's commitment to environmental management practices can significantly affect how an EMS enhances the latter's performance advantages. EMS impact research has pointed out how EMS influences the environmental performance of organisations. Comparison with other firms Many researchers including Melnyk, Sroufe and Calantone (2003) have noted that firms with certified EMS deluxe performing better than their counterparts without the certification. It is therefore hypothesized that organisations that incorporates EMS in strategic management are likely to improve their financial performance and competitiveness over a period of time (Florida & Davison, 2001). This appears as a cross-sectional study to compare the organizations that have already applied EMS to those that have not to enhance more understanding. Consequently, the need for the study to educate the firms on the advantages and disadvantages of EMS implementation for sustainable business practices.

This study reviews the extent of EMS adoption in different regions of the world and establishes the influence that legal systems, market forces, and institutional pressures have on the adoption of EMS. This is because, in Europe, there are severe laws, policies, and institutions that have greatly influenced the embrace of EMS. Market incentives and corporate social responsibility are the primary drivers of recycling and recyclable materials management in North America and the Asia region due to government policies and international markets. The increased uptake of EMS, as observed globally, is in line with the general trends toward integrating environmental conservation into business management. This change is supported by literature that shows that companies with certified EMS not only excel in environmental management but also get operational benefits and improved stakeholder and market standing (Johnstone & Hallberg, 2020).

2. Literature Review

EMS and financial returns literature employs a number of methods to analyse the financial performance as influenced by the EMS. To this section, the primary methods and results of most important works of this field are presented in an orderly manner, emphasizing both empirical approaches and discoveries. One of the most common approaches to explaining how EMS impacts financial performance is a ''black box'' called hierarchical regression analysis, which reveals that customer happiness and the resulting customer loyalty account for the financial performance enhancement. The study also supported the propositions that

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switching costs moderated the relationship between EMS and customer satisfaction while EMS had an impact on financial performance. Competitive rivalry and switching cost are estimated as contextual variables by Hierarchical moderated regression analysis.

Feng et al. (2016) found out that EMS enhances financial returns in Chinese manufacturing enterprises, while the competition intensity as a moderator enhances the positive impact of EMS on the financial returns of the manufacturing enterprises; on the other hand, switched costs as another moderator dampens the positive impact of EMS on the financial returns of the Chinese manufacturing enterprises. Focusing on the above arguments it can be explained that this study proves the fact that market circumstances moderate the financial impact of EMS. Another method that fits the cross-sectional research design has been employed to examine the temporal impact of EMS adoption. While investigating the impact of EMS, Song, Zhao, and Zeng (2017) discovered that their research on Chinese listed enterprises proved that EMS improves the performance over time although it may not produce an immediate effect. This temporal perspective also explains why EMS investments are a virtuous cycle that are rewarding in the long run although they are not in the short-run.

To consolidate one thing and mixed findings regarding the effectiveness of EMS for green management on their monetary performances, Molina-Azorín et al. . (2009) conducted a meta- analysis on 32 quantitative studies. However, many other such studies support the hypothesis picturing a positive, albeit inconsistent within contexts, industries, and nations, relationship. These stand as important pieces of evidence in proving that the use of regression analysis is efficient in analyzing of such relations. Thus, structural equation modeling (SEM) was used to test an indirect effect of EMS on financial performance through environmental performance.

In this present research, SEM was employed by Deb et al. (2022) on Bangladeshi manufacturing enterprises and established that EMS improves both environmental and financial performance as a function of knowledge and energy management. It offers great opportunities to understand the causal relations concerning EMS accreditation. These include hierarchical regression analysis and moderated regression analysis to analyze panel data regression models, structural equation models and difference in difference models in EMS research. Such research have described the influence of EMS adoption on financial performance. The investigation shown that but, whether EMS does or does not improve financial performance, it depends on various market conditions, laws and other factors corresponding to a firm. Researchers should extend these methodologies, looking at the way EMS influences diverse organisation contexts.

2.1. Environmental Benefits of EMS Adoption: Literature Evidence The following are the literature evidence

EMS brings about numerous environment yields that have positive and direct impact on a company's sustainability and performance. Based on the literature, this section synthesises the findings relating to the impact of EMS on emissions improvements. Other authors, such as Melnyk, Sroufe and Calantone (2003), also describe how EMS can be a positive for the environment. It demonstrated when they focused researching only the companies having certified EMS in compliance with the ISO 14001 standard, impressive decrease in pollution levels, and increase the usage of resources efficiently, and enhancements in waste management were also evident. It was established through this research that organizations stand to gain through the implementation of formal and certified EMS frameworks more so regarding their environmental performance.

Martín-Peña, et al (2014) sought to establish the advantages of EMS for the automobile companies in Spain. Based on the study, the case being made is that EMS adoption positively affected the organization's environmental status, stakeholder management, and access to the best environmental technologies. The automobile companies cut down emissions and waste content hence pointing to the fact that EMS aids in environmental sustainability. The trailing assessment by Johnstone & Hallberg was conducted in 2020 where they assessed the impact arising from ISO 14001 adoption by SMEs. EMS adoption for internal environmental management and impact reduction enhanced the environment in accordance with their study. All these advancements were in the favor of the firms, society, and regulatory compliance. Canadian, German, Hungarian, and American enterprises were investigated by Darnall, Henriques, and Sadorsky 2008. Firms that established complete EMS and those driven by resources and capability rather than by institutionalism also recorded better environmental performance changes than the others. These covered emission of greenhouse gases and other resources that were used in the provision of the health services.

3. Research Methodology

Thus, in the present research, the focus is on how EMS influences Pakistani enterprises having stocks traded on PSX. This part explains the approach, statistical analysis, and processes applied in the study to ensure precision of the outcomes. ROA and ROE are estimated using the Generalized Method of Moments (GMM) to investigate the impact that EMS implementation has on company performance. GMM is better because it fare better when faced with endogeneity, situations whereby some independant variables are correlated with the error term. This method is used since instruments reduces the impact of endogenous variables thus leading to reliable results. Most of the GMM estimators are efficient and consistent when used in identifying the dynamic panel data models with reasonable accuracy (Hansen, 1982).

3.1. Variables and Definitions

In this section, we define the research variables that are relevant to our research, focusing on the effectiveness of EMS on corporate performance. It is, therefore, critical to present clear definitions and sources of these variables so as to enhance the reliability of the study outcomes. Before these concepts are measured, we need to demystify the following variables and their operational definitions have been given in table A.

4. Analysis

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 A

Metric	Symbol	Definition	Source	Relevance
Stock Price	SPC	The stock price of a firm at the end of a particular trading day.	S&P Capital IQ	Examines the market capitalization and investors' sentiment about the financial fitness of the firm (Fama, 1970).
Return on Assets	ROA	This refers to a way of measuring the percentage return on the total assets available for business operations.	S&P Capital IQ	Shows how well a firm is managing or deploying assets to make profits (Kieso Weygandt and Warfield, 2016).
Sales Growth	SGA	The sales growth of a product or service within a given time frame.	S&P Capital IQ	Measure of a firm's ability to increase its revenue, which is important for sustainability (Lev & Thiagarajan, 1993).
Return on Capital	ROC	An indicator of the level of profits generated and the value added per every dollar invested in the company.	S&P Capital IQ	Critical in analyzing past financial performance and planning the allocation of capital in the future (Bacidore et al., 1997).
Account Receivable Turnover	ART	The frequency with which a company writes off its average accounts receivable.	S&P Capital IQ	Demarcates the effectiveness of a firm's credit management strategies and credit collection mechanisms (Gitman, Juchau, & Flanagan, 2015).
Return on Equity	ROE	A business performance measurement that is determined by the ratio of net income to shareholders' equity.	S&P Capital IQ	Helps in understanding the manner in which a firm is utilizing equity to make profits (Ross et al., 2015).

Table 1: Descriptive Statistics

Variables	Companies	Mean	Std.Dev.	Min	Max	Observations	No. of Com.
Change in Stock Price	overall	2.5575	7.468766	0	104.22	N=1092	n=52
Return on Assets	overall	8.263123	7.16982	-14.61	43.15	N=1092	n=52
Sales Margin	overall	8.180088	6.808365	0.01	34.18	N=1092	n=52
Return on Capital	overall	11.78485	12.51881	-46.02	72.93	N=1092	n=52
Account Receivable Turnover	overall	32.62815	50.72971	0.43	298.48	N=1092	n=52
Return on Equity	overall	17.96221	39.77904	-250.57	784.79	N=1092	n=52

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.

Table 2: Correlation Analysis

Variables	Change in Stock Price	Return on Assets	Sales Margin	Return on Capital	Account Receivable Turnover	Return on Equity
Change in Stock Price	1					
Return on Assets	0.24	1				
Sales Margin	0.167	0.1284	1			
Return on Capital	0.3081	0.8929	0.0794	1		
Account Receivable Turnover	0.2735	0.1634	0.0971	0.1778	1	
Return on Equity	0.3366	0.4163	0.0048	0.4685	0.0984	1

Applying the GMM analysis to EMS companies, the dynamic relationships between the selected financial performance measures and stock return variances can be described effectively. By employing this analysis, endogeneity is controlled, and this gives reliable and unbiased estimates. Table 3 below shows the GMM estimates of the coefficients for the EMS companies and the respective p-values for the coefficients, as well as the diagnostic tests for the validity of the model. The GMM analysis of the financial performance of EMS companies reveals that the relationship between financial performance indicators and stock prices is complex and dynamic. The high level of L1.spc and the positive influence of ROA reveal the market appreciation of efficient management of assets in EMS firms. Nonetheless, the negative signs of the sales margin and ROC suggest that engaging in sustainability investments may come at the cost of short-term financial returns. These trade-offs must be managed to realize the full potential of EMS adoption. The diagnostic tests justify the GMM model, enhancing the credibility of the conclusions.

Table 3: GMM (Generalized Method of Moments) Analysis

	EMS	
Change in Stock Price	Coef.	zP>|z|
L1.Change in Stock Price	0.894691	0
Return on Assets	0.440627	0
Sales Margin	-0.15475	0
Return on Capital	-0.15758	0
Account Receivable Turnover	0.090557	0
Return on Equity	-0.04622	0
_cons	-1.98392	0
Number of groups	52	
Number of instruments	39	
AR(1)	0.026	
AR(2)	0.492	
Sargan test	0	
Hansen test	0.254	

5. Discussion of Results

Various management systems and strategies are crucial in determining the financial performance of firms. The following section focuses on the comparison between EMS users and non-users in terms of their financial performance, as well as the impact of EMS on the profitability and sustainability of firms. The literature review indicates that firms that implement EMS may achieve better financial performance than firms that do not implement such systems. Klassen and McLaughlin (1996), for instance, established that firms that received environmental performance awards as an indication of sound environmental management practices enjoyed positive market returns. On the other hand, firms that faced environmental crises received significantly negative returns, which proves the financial consequences of poor environmental management. EMS can result in better financial performance due to better management of resources and less wastage. Watson et al. (2004) also established that firms that adopted EMS did not have the perceived cost disadvantage effect; instead, they had no adverse effect on their financial performance. This, therefore, contradicts the belief that implementing environmental management leads to increased production costs. In addition, the application of EMS in manufacturing firms has been reported to have favorable financial implications. Feng et al. (2016) have researched Chinese manufacturing firms, and they have observed that the implementation of EMS has a positive influence on financial performance, particularly in the competitive market environment. However, high switching costs weakened this positive relationship, meaning that firms should take into account the market dynamics and cost of switching when adopting EMS. The effect of EMS on financial performance is also seen in the services sector, thus confirming the hypothesis. In a similar study conducted by Lucas and Wilson (2008), it was found that service organizations that have practiced environmental management showed signs of enhanced financial performance. They extend their research across a diverse set of services and found that contextual evidence from non-manufacturing industries supports the idea that environmental management has a positive effect on financial performance. The difference between those companies that have implemented EMS and those that have not is a clear indication of the financial impacts. Research findings reveal that companies that have effective environmental management systems in place are likely to perform better than those that do not. This divergence in performance can be explained mainly by the fact that better environmental management leads to improved operations and a positive organizational image. The literature review by Molina-Azorín et al. (2009) can also be used to support the above findings since the authors observed that the majority of the studies reviewed reveal a positive relationship between environmental management and corporate performance. This positive correlation is seen across a number of industries and regions, which strengthens the argument for the universal applicability of EMS advantages. Environmental Management Systems generally have positive effects on financial performance. Organizations that implement effective environmental management systems are likely to achieve higher levels of operational performance, higher market returns, and higher profitability than their counterparts that do not adopt such systems. These advantages signify the importance of implementing EMS for the enhancement of financial and ecological performance in the future.

6. Conclusion

The research questions that were posed in this study were as follows: What are the financial and environmental performance implications of implementing EMS? Are there differences in the financial and environmental performance between EMS adopters and non-adopters? The study offers valuable insights into the impact of EMS implementation on different aspects of organizational performance. Another primary purpose was to assess the financial outcomes of companies before and after implementing the EMS. The literature review reveals that EMS adoption results in enhanced financial performance. For instance, Watson et al. (2004) argued that firms that adopted EMS did not suffer from the perceived cost disadvantage but rather felt no adverse effects on financial performance, thus implying operational efficiency gains (Watson, et al. 2004). For instance, Lo et al. (2012) revealed that ISO 14001 adopters in the fashion and textiles industry enhanced their ROA and ROS because of enhanced resource management and pollution control. This study also sought to establish the difference in the financial performance between EMS adopters and non-adopters. Research shows that the adopters of EMS are financially better than the non-adopters of EMS. For instance, Wang et al. (2022) revealed that enterprises that adopted EMS reported considerably better levels of operational improvements and environmental performance as compared to those that did not adopt the system (Wang et al., 2022).

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.

References

Campos, L. M. (2012). Environmental management systems (EMS) for small companies: A study in Southern Brazil. *Journal of Cleaner Production, 32*, 141-148.

Darnall, N., Henriques, I., & Sadorsky, P. (2008). Do environmental management systems improve business performance in an international setting? *SEIN Social Impacts of Business eJournal*.

Deb, B. C., Rahman, Md. M., & Rahman, M. S. (2022). The impact of environmental management accounting on environmental and financial performance: empirical evidence from Bangladesh. *Journal of Accounting & Organizational Change*.

Feng, T., Cai, D., Wang, D.-S., & Zhang, X. (2016). Environmental management systems and financial performance: The joint effect of switching cost and competitive intensity. *Journal of Cleaner Production, 113*, 781-791.

Florida, R., & Davison, D. (2001). Gaining from green management: Environmental management systems inside and outside the factory. *California Management Review, 43*(3), 64-84.

Hansen, L. P. (1982). Large sample properties of generalized method of moments estimators. Econometrica, 50(4), 1029-1054.

Johnstone, L., & Hallberg, P. (2020). ISO 14001 adoption and environmental performance in small to medium-sized enterprises. *Journal of Environmental Management, 266*, 110592.

Klassen, R., & McLaughlin, C. (1996). The impact of environmental management on firm performance. *Management Science, 42*(8), 1199-1214.

Lo, C., Yeung, A., & Cheng, T. (2012). The impact of environmental management systems on financial performance in fashion and textiles industries. *International Journal of Production Economics, 135*(2), 561-567.

Martín-Peña, M. L., Díaz-Garrido, E., & Sánchez-López, J. M. (2014). Analysis of benefits and difficulties associated with firms' Environmental Management Systems: the case of the Spanish automotive industry. *Journal of Cleaner Production, 70*, 220-230.

Melnyk, S. A., Sroufe, R. P., & Calantone, R. (2003). Assessing the impact of environmental management systems on corporate and environmental performance. *Journal of Operations Management, 21*(3), 329-351.

Molina-Azorín, J. F., Claver-Cortés, E., López-Gamero, M. D., & Tarí, J. (2009). Green management and financial performance: a literature review. *Management Decision, 47*(7), 1080-1100.

Song, H., Zhao, C., & Zeng, J. (2017). Can environmental management improve financial performance: An empirical study of A-shares listed companies in China. *Journal of Cleaner Production, 141*, 1051-1056.

Testa, F., Heras-Saizarbitoria, I., Daddi, T., Boiral, O., & Iraldo, F. (2016). Public regulatory relief and the adoption of environmental management systems: a European survey. *Journal of Environmental Planning and Management, 59*(12), 2231-2250.

Ushakov, D., Goryunova, E., & Shatila, K. (2021). Assessing the impact of environmental management systems on corporate and environmental performance. *IOP Conference Series: Earth and Environmental Science, 937*, 022038.

Wang, Y., Rehmani, M., Ashraf, M. R., Farheen, N., & Irshad, H. (2022). Comparing the EMS adopter and EMS non-adopter organizations in achieving sustainable business goals. *Frontiers in Psychology, 13*.

Watson, K., Klingenberg, B., Polito, T., & Geurts, T. (2004). Impact of environmental management system implementation on financial performance: A comparison of two corporate strategies. *Management of Environmental Quality: An International Journal, 15*(6), 622-628.