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Determining Mediating Role of Managerial Commitment and Technological Capability Between Environmental Management Accounting and Organisational Efficiency: A Case of Middle Eastern Countries

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Abstract

The main aim of the following study is to investigate the mediating role of managerial commitment and technological capability between environmental management accounting (EMA) and organizational efficiency in the case of Middle Eastern countries. The data is mainly collected through primary sources. The questionnaire survey is developed and distributed among the non-financial listed organization firms established in 6 Middle Eastern countries through a web-based survey. The 6 Middle East countries selected for gathering data are Jordan, Saudi Arabia, Egypt, Qatar, Oman and Kuwait. Data is collected from 476 participants where the structural equation modelling (SEM) is conducted. The study's results depicted that the EMA has a significant and positive effect on organizational efficiency. Moreover, both managerial commitment and technological capability were determined to have a significant and positive mediating role between EMA and organizational efficiency. Thus, the outcome of the study is that managerial and technological commitment plays a major role in EMA and organizational efficiency among Middle Eastern countries. Future studies can be conducted by targeting other countries such as Asian or European countries or using a qualitative approach such as interviews for gaining in-depth information.

Keywords

Environmental management accounting; Managerial commitment; Technological capabilities; Organizational efficiency; Environment; Middle East

1. Introduction

Environmental management accounting (EMA) is considered one of the successful notions in order to reduce environmental burdens in the form of carbon footprints and energy dependence. According to the study conducted by Gunarathne & Lee (2015), there are several features of environmental management accounting, like material flow cost, ecological control, and sustainability balance. These features are very useful in identifying the firm's effect on the ecological conditions. Environmental management accounting is also considered an interior management tool; in this way, the efficiency of many organizations is evaluated. On the other hand, managerial commitment and technological capability are those factors which have a mediating role in the efficiency of the organizations (Burritt et al., 2019). In this particular research, these factors are also considered to evaluate the overall performance of the middle east countries. However, there are several studies in this regard in which organizational efficiency has been analyzed with respect to environmental management accounting. However, there is no prominent study, or maybe less research has been done on the middle counties.

Alongside this, the research is motivated due to the lack of empirical evidence in order to evaluate the impact of environmental management accounting on organizational efficiency in middle east countries. Therefore, with respect to this identification of the problem, this particular study mainly focused on these countries. According to Gunarathne & Lee (2015), it has been concluded that processes of environmental consciousness are enhanced, but the objectives of the management remain out of reach mainly due to the reason management support. Therefore, the role of managerial commitment cannot be ignored by the management itself because of its significance in order to achieve productive organizational growth (Qian et al., 2018). The aim of the study is to determine the role of managerial commitment and technological capability between environmental management accounting and organizational efficiency, specifically in middle east countries. For further details, the hypothesis is developed with the help of a literature review in order to evaluate the mediating effect in an approximate way. On the basis of the given concern, an extensive literature review has been analyzed in order to evaluate the environmental processing within the organization in order to enhance the financial cost of the company (Qian et al., 2015). However, the expected outcome of the research can be useful and relevant to environmental management policies. It will further evaluate the role of two mediating factors of management commitment and technology capability that either these two factors further increase the efficiency of the organizations of the middle east or vice versa.

2. Literature Review

2.1. EMA and its Effect on the Organizational Efficiency

According to the study conducted by Fullerton et al. (2014), it has been observed that there is a significant effect of environmental management accounting on the organizational performance of the organization. The company's financial performance is generally based on certain financial ratios like return on assets and

equity. These financial ratios of the organizations create long-term financial efficiency. These ratios are also considered and studied by the study of Gunarathne & Lee (2015), and further it is explained in the study that return on sales (ROS) is on the other hand, which reflects short term financial performance. In this way, it was explained that environmental management accounting does not affect significantly on the return on sales of greenhouse gas reduction. Study conducted by Paillé (2014), is purely based on empirical evidences and it was stated that there is strong relationship between environmental management accounting and overall profitability of organizations of Czech. Profitability of the organizations also increased by driving down overall cost more than revenue. In other words, organizations can minimize their overall cost by the help of environmental management accounting. In the same way, poor environmental performance has negative impact on the intangible assets value of public traded companies. Therefore, management of organizations spend more money on the environmental concerns by adopting several technologies that can heave their prominent impact on the environmental issues. In order to find out the impact of the of environmental management accounting on the performance of companies of the middle east companies, following hypothesis is considered to evaluate its impact.
H1: There is a significant effect of EMA on the organizational efficiency

2.2. EMA and its Effect on the Managerial Commitment

Research has also prominent concern for the influence of the environmental management accounting as well as business strategies of several organizations, in which positive relationship has been evaluated in terms of management commitment. There is no doubt that each of the organizations has a vision and goals which are achieved by management committee. Therefore, environmental strategies of the companies have prominent effect on theirperformance (Latan et al., 2018). Alongside with this, it is also observed that top management commitment has shown a positive relationship with respect to the environmental strategy. In case of this particular study, in order to find out the impact of the environmental management accounting on the managerial commitment, a following hypothesis is created:
H2: There is a significant effect of EMA on the managerial commitment

2.3. EMA and its Effect on the Technological Capability

According to the study of Wilden and Gudergan (2015), there are several types of organization whose management has decided to adopt the factor of technology in their firms and for that transformation of digital business have been introduced in order to complex as well as digital initiatives on the strategy of the environmental management accounting. There is also a significant relationship of networks, partners, and stakeholders. At the same time, there is another study of Wu (2014), which explain the different operators of the environmental management accounting through which the management of the companies are able to brought several changes to meet the needs of stakeholders and the expatiations. For that, hypothesis be like:
H3: There is a significant effect of EMA on the technological capability

2.4. Managerial Commitment and its Effect on the Organizational Efficiency

It is obvious that employees and higher management of an organization play significant role in order maintain the profitability of an organization. As per the study of Ashikali and Groeneveld (2015), the success rate of organizations always depends on the loyalty of organization. In other words, if the employees of the organization are committed than ultimately there are significant chances of high growth of the organization. Commitment can be taken as the willingness of the employee towards theorganisation for the sake of its profitability. Therefore, following is the hypothesis in order to find out the relationship between managerial commitment towards organizational performance.

H4: There is a significant mediating effect of managerial commitment between EMA and organizational efficiency

2.5. Technological Capability and its Effect on the Organizational Efficiency

The factor of technology is on the other hand which also have its relation towards its profitability. This factor has been discussed in many of the research studies that technology factor is an enormous for the development of organization through innovative process. Innovative process is on the other hand (Wu, 2014). According to Tzokas et al. (2015), technological innovation has its impact on the industry in terms of financials, suppliers and customers. Furthermore, in order to evaluate this relationship, following hypothesis is created that can provide results through empirical evidences.

H5: There is a significant mediating effect of technological capability between EMA and organizational efficiency

Following is the conceptual framework for the study.

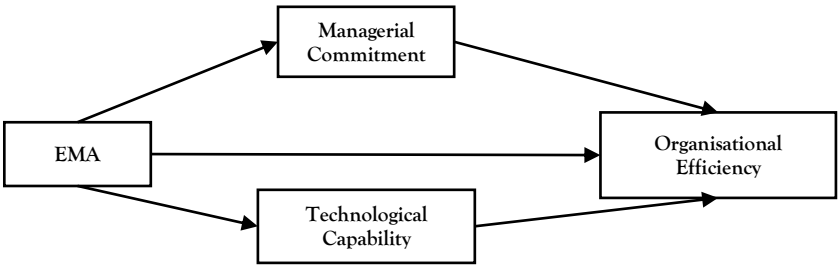

Figure 1: Conceptual framework

3. Theoretical Framework

In the segment of theoretical framework, a contingency approach to the management has been considered. The theory of contingency is purely based on the effectiveness of the management as well as behaviours and different situations (Strizhakova and Coulter, 2015). In other words, this theory prominently changed the behaviours of the management under certain circumstances. According to the study conducted by Agogué et al. (2017), the approach of contingency theory states the effectiveness of the leadership and its relations to the effectiveness of the team. In further details, it depends on two different factors and these factors known as task motivation and circumstances. These factors are measured by the help of least

preferred co-worker (LPC) (Örtenblad and Koris, 2014). This theory is implemented in order to find out the impact of environmental management accounting on the organization performance in the presence of mediating role of the middle east companies. Under different circumstances, this theoryprominently helps the management to apply different strategies and to create different environment to have positive impact on the performance of the organizations. As there are two mediating factors of technology and managerial commitment are considered in the research, therefore, contingency theory can also explain these factors in an appropriate way.

4. Methodology

The main aim of the following study is to investigate the mediating role of managerial commitment and technological capability between the environmental management accounting and organizational efficiency in a case of Middle Eastern countries. The data is mainly collected through primary sources where the questionnaire survey is developed and distributed among the non-financial listed organization firms that are established in 6 Middle Eastern countries through web-based survey. The 6 Middle East countries selected for gathering data are Jordan, Saudi Arabia, Egypt, Qatar, Oman and Kuwait. As per the questionnaire survey, the formula is adopted for identifying the sample size is following:

$$n = \frac{z^2 \times p \times q}{e^2}$$

$$n = \frac{(1.96)^2 \times 0.5 \times (0.5)}{(0.05)^2} = 384$$

For reaching the targeted sample, the questionnaire is distributed among 384 individuals where 500 questionnaires are distributed. The total numbers of complete survey provided by the participants are 476 which accounts for 95.2% responses. The tool that is used for evaluating the questionnaire survey is Smart PLS which is utilized for conducting the structural equation modelling (SEM). Through SEM, the confirmatory factor analysis (CFA) is conducted for evaluating the reliability and validity of data. Moreover, discriminatory validity is also applied on the dataset for identifying the degree of distinctiveness among the variables. Lastly, the path coefficient is conducted for examining the mediating role of managerial commitment and technological capability between environmental management accounting and organizational efficiency.

5. Results and Discussions

The first approach taken through the Smart PLS technique is evaluating the validity and reliability of data by applying confirmatory factor analysis which is shown in table 1. The components that are involved for conducting the tests consist of factor loading, Cronbach's Alpha, composite reliability and average variance extracted (AVE). The first technique is factor loading which is applied on the items of the construct for evaluating its absolute contribution where the value for meeting the

criteria must be above 0.6 (Yana et al., 2015; Munir, 2018). In this respect, it was identified that all the items of the constructs had absolute contribution as their value was above 0.6. Cronbach's alpha was used for measuring the internal consistency of the variables where its threshold point is 0.6 (Raman et al., 2014; Triwidyati & Tentama, 2020). The Cronbach's alpha value of the variables was determined to be above 0.6 which depicts that the variables were reliable. Similar to Cronbach's alpha is the composite reliability which is also conducted for determining the internal consistency of the variables where its threshold point is 0.6 and above (Meilani et al., 2020.). Hence, the composite reliability of the variables was identified to be above 0.6 which depicts that the variable is reliable. The last technique is AVE where its threshold value for determining a reliable variance of the variables is 0.5 (Lukman et al., 2019). In this respect, it was identified that the lowest AVE value was 0.546 which meets the criteria. Hence, on the basis of CFA, it is clear that the data are reliable and valid for conducting examination.

Table 1: Convergent Validity and Reliability

Variables	Items	Factor Loading	Cronbach's Alpha	Composite Reliability	AVE
EMA	EMA1	0.889	0.878	0.925	0.805
	EMA2	0.922			
	EMA3	0.879			
Managerial Commitment	MCOM1	0.833	0.897	0.929	0.765
	MCOM2	0.883			
	MCOM3	0.885			
	MCOM4	0.896			
Organizational Efficiency	OE1	0.694	0.793	0.855	0.546
	OE2	0.647			
	OE3	0.617			
	OE4	0.855			
	OE5	0.847			
Technological Capability	TC1	0.905	0.900	0.937	0.833
	TC2	0.928			
	TC3	0.905			

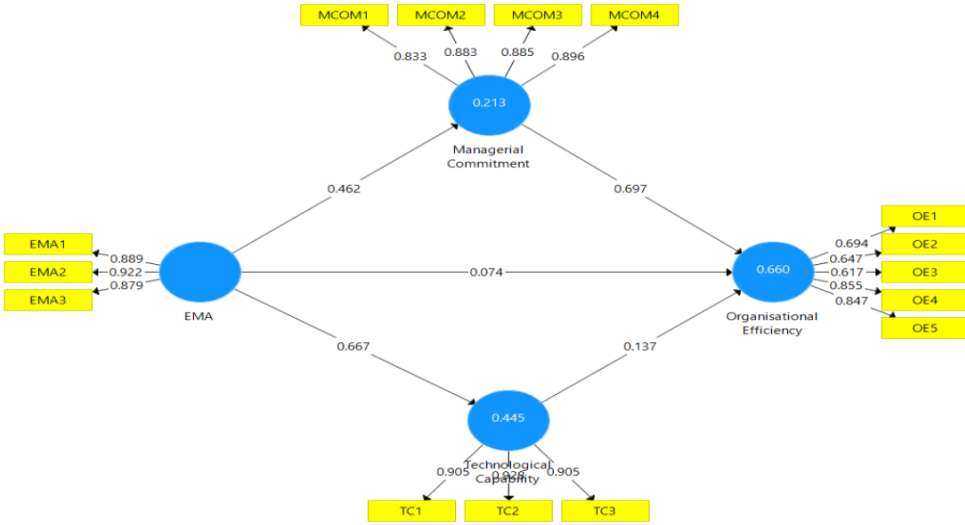

Figure 2: Confirmatory Factor Analysis

Table 2 reflects on the discriminant validity which commonly examines the degree of distinctiveness among the variables where it is vital that the variable do not have high correlation with each other (Dahri et al., 2019). The technique that is used for evaluating the discriminant validity of the variables is through the HTMT ratio which evaluates the association of the variables with each other for determining the level of differences where its threshold points if 0.90 (Tobias-Mamina and Kempen, 2020). As per the results in table 2, it is clear that none of the variables violates the criteria of HTMT ratio where the highest value is determined between organizational efficiency and managerial commitment which is 0.897. Hence, based on validity and reliability results, it can be indicated that the analysis can be conducted among the results for revealing the findings for the study.

Table 2: Discriminant validity (HTMT Ratio)

	EMA	**MCOM**	**OE**
EMA			
MCOM	0.518		
OE	0.571	0.897	
TC	0.750	0.522	0.595

Path coefficient is the most important statistical analysis technique that is applied on the data for determining the effects of environmental management accounting on organizational efficiency along with the mediating role of managerial commitment and technological capability. The significance of the variables is identified through three confidence interval points which are 99% (0.01), 95% (0.05) and 90% (0.10). Moreover, the beta (B) value is assessed for determining negative or positive influence among the variables. As per the results shown in table 3, it has been identified that EMA has significant and positive effect on managerial commitment (B=0.462; p=0.000), organizational efficiency (B=0.073; p=0.078) and

technology capability (B=0.667; p=0.000). With every unit change to EMA would result in causing a change to managerial commitment, organizational efficiency, and technology capability positively by 0.462, 0.073 and 0.667 units respectively. Moreover, managerial commitment is also identified to have significant and positive effect on organizational efficiency as the p-value is lower than the identified confidence interval while the beta value is computed as 0.702. Similarly, technological capability is also determined to have significant and positive effect on the basis of p-value is compute as 0.001 while its beta value is determined as 0.134. As per the mediating effects of the variables, managerial commitment is found to have significant and positive mediating effect between EMA and Organizational efficiency (B=0.324; p= 0.000). Similarly, technological capability is also found to have significant and positive mediating effect between EMA and Organizational efficiency (B=0.089; p= 0.002).

Table 3: Path Coefficient

	Beta	T-stats	P-Values
EMA -> Managerial Commitment	0.462***	9.9	0.000
EMA -> Organisational Efficiency	0.073*	1.761	0.078
EMA -> Technological Capability	0.667***	21.762	0.000
Managerial commitment -> Organizational Efficiency	0.702***	22.315	0.000
Technological capability -> Organisational Efficiency	0.134***	3.247	0.001
EMA -> Managerial Commitment -> Organisational Efficiency	0.324***	9.266	0.000
EMA -> Technological Capability -> Organisational Efficiency	0.089***	3.176	0.002

***Significance at 1%; ** Significance at 5%; * Significance at 10%

The coefficient of determination or R-square of the model is evaluated for determining the variance that can be predicted from the model (Zhang, 2017). In addition, Q-square is conducted for determining the predictive relevance of the model where the value must be higher than zero (Al-Gharaibah, 2020). As per table 4, there are mainly 3 models in the study where the first model is associated with managerial commitment. The R-square is computed as 21.30% which indicates that the variance of managerial commitment can be explained or predicted by 66.03%. Similarly, organizational efficiency R-square is computed as 66.03% whereas technological capability R-square is computed as 44.54%. The Q-square of the models is above 0 which indicates that it meets the criteria of predictive relevance.

Table 4: Quality of model and predictive relevance

	R Square	R Square Adjusted	Q-Square
Managerial Commitment	21.30%	21.13%	0.160
Organizational Efficiency	66.03%	65.82%	0.345
Technological Capability	44.54%	44.42%	0.368

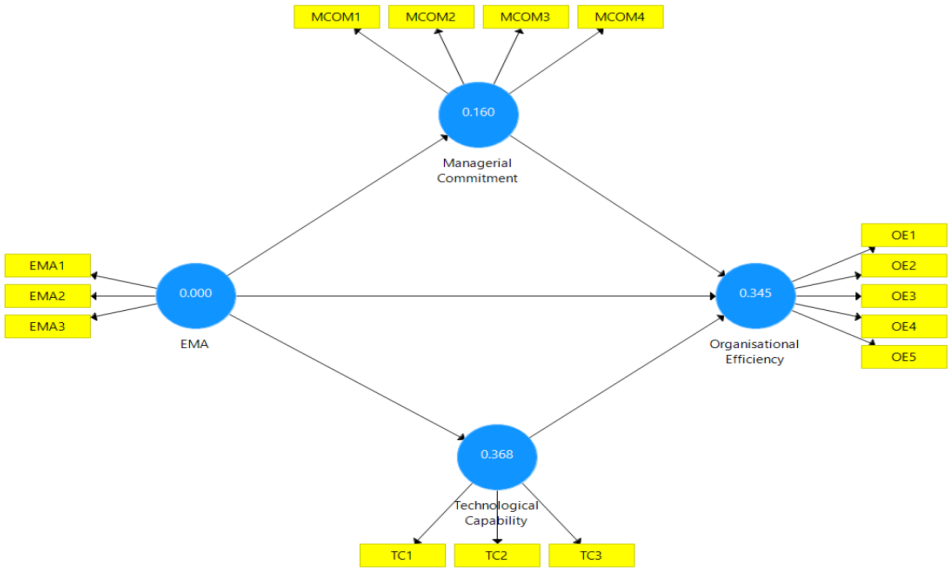

Figure 3: Blindfolding Technique

Table 5: Hypothesis testing

S. No.	Hypothesis Statement	Significance value	Result
H1	There is a significant effect of EMA on the organizational efficiency	B=0.073 (p= 0.078)	Accepted
H2	There is a significant effect of EMA on the managerial commitment	B= 0.462 (p=0.000)	Accepted
H3	There is a significant effect of EMA on the technological capability	B= 0.667 (p=0.000)	Accepted
H4	There is a significant mediating effect of managerial commitment between EMA and organizational efficiency	B=0.324 (p=0.000)	Accepted
H5	There is a significant mediating effect of technological capability between EMA and organizational efficiency	B=0.089 (p=0.002)	Accepted

6. Conclusion

Environmental management accounting is considered a highly important aspect of business for reducing ecological burdens in the form of carbon footprints and energy dependence. The following study is mainly conducted to evaluate the effect of EMA on organizational efficiency while also evaluating the mediating role of

managerial commitment and technological capability, particularly in the Middle East countries. The approach for conducting the analysis is distributing a questionnaire survey and applying the SEM from Smart PLS. The results of the study depicted that the EMA has a significant and positive effect on organizational efficiency. Moreover, both managerial commitment and technological capability were determined to have a significant and positive mediating role between EMA and organizational efficiency. Thus, the study's outcome is that managerial and technological commitment plays a major role in EMA and organizational efficiency among Middle Eastern countries.

As per the approach that is taken in the study, future studies can be conducted by targeting other countries, such as Asian or European countries, to determine the mediating role of technological capability and managerial commitment between EMA and organizational efficiency. In addition, qualitative approaches such as interviews can also be conducted to determine the role of EMA in enhancing the organization's efficiency, which can support gaining in-depth data. The limitations faced in the study were that it has mainly emphasized on mainly Middle Eastern countries where the practical implications are not applicable to other countries.

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