ENVIRONMENTAL MANAGEMENT ACCOUNTING STRATEGY: A CASE OF CEMENT COMPANIES

Huong Thi Lan Tran *, Huyen Thanh Nguyen **

* *Corresponding author,* Faculty of Economics and Business Administration, Hong Duc University, Thanh Hoa, Vietnam
Contact details: Faculty of Economics and Business Administration, Hong Duc University, 565 Quang Trung 3, Dong Ve Ward, Thanh Hoa city, Thanh Hoa province, Vietnam
** University of Finance and Business Administration, Hung Yen, Vietnam

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Abstract

Environmental management accounting (EMA) involves using financial and non-financial data to improve environmental and economic performance for sustainable business (Bennett et al., 2003). It helps managers address environmental pressures, enhance reputation, and control costs (Ngoc, 2017). Despite its benefits, EMA adoption in Vietnamese cement companies is limited. This study identifies factors influencing EMA implementation, revealing that managerial awareness has the greatest impact, while accountants' qualifications play a smaller role. To collect data, a survey was conducted involving 265 managers, accountants, and staffs from Vietnamese cement companies. Using both qualitative and quantitative approaches, the study employed Cronbach's alpha, exploratory factor analysis (EFA), and regression analysis. The findings reveal five key factors influencing the adoption of EMA in these companies: managers' awareness, company size, stakeholder pressure, financial resources, and the qualifications of accountants. Based on these findings, the authors propose solutions to enhance the practicality of implementing EMA in Vietnamese cement companies, aiming to improve their image and reputation while boosting operational efficiency in alignment with sustainable development goals.

Keywords: Management Strategy, Environmental, Cement Companies, Environmental Management Accounting, Vietnam

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1. INTRODUCTION

The cement industry is an industry with a long history of development in the world. In Vietnam, the first cement plant was established in 1899 by French colonizers. By 1955, this plant was nationalized to support the construction of socialism in the north, marking the beginning of the development of the cement industry (Tran, 2020). With the advantages of abundant limestone resources, cheap labor, and government investment, the cement industry has gradually become one of the sectors that has achieved many successes, contributing significantly to the state budget each year and playing a part in the country's economic recovery and

growth. However, Vietnamese cement enterprises have faced many challenges, owing to a fluctuating business environment. Vietnamese cement companies not only have to compete fiercely with major players in the global cement industry, who have advanced production technologies, a wide range of products, and affordable prices that meet market demands, but also have to tackle domestic issues related to capital, human resources, legal regulations, health protection, and especially the environmental problems arising during the production of cement and clinker products. Cement production requires many materials and non-renewable fossil resources. According to Vietnamese Cement National Association (2022), the process of burning clinker and grinding cement generates dust and harmful emissions, such as CO_2, CO, NO_x, and SO_x, which negatively impact the environment. The cement industry has emitted 7% of the total carbon emissions worldwide, which corresponds to the production of nearly 100 million tons of cement per year, consuming approximately eight million tons of coal. This is one of the major obstacles for cement companies to meet environmental obligations and fulfil social responsibilities, while the cement industry is dealing with numerous challenges.

In recent years, Vietnamese cement companies have frequently faced regulatory violations related to environmental issues during their operations. For instance, Thanh Thang Group Cement Company violated discharge regulations and lacked a response plan for environmental protection as well as environmental reporting; Xuan Thanh Cement Company submitted an environmental report that didn't follow the correct format, and the compiled data wasn't accurate (Anh, 2024); and Tan Quang Cement Joint Stock Company engaged in dust and emissions discharging that exceeded technical standards (Nguyen, 2022). According to Vietnamese law, these companies not only face fines for administrative violations under Government Decree No. 80/2021/ND-CP, with penalties of 1.8 billion Vietnamese dongs (VND), VND 15 million, and VND 3.3 billion for three companies, respectively, but they could also be suspended from operations for six months to a year. This has a seriously negative impact on the financial performance, operational efficiency, as well as the reputation and standing of the cement companies.

In light of this situation, Vietnamese cement manufacturing companies need establish measures to manage environmental issues, enabling businesses to promptly capture information about incurred costs to address environmental problems, tackle pressures from the community and society to achieve legality in operations, and enhance their position and image to gain strategic competitive advantages
while controlling costs to achieve the best economic-environmental benefits aimed at sustainable development, environmental management accounting is one of the most efficiency key to solve these obstacles.

Environmental management accounting (EMA) is the management of environmental and economic performance through the development and implementation of appropriate environment-related accounting systems and practices (International Federation of Accountants [IFAC], 2005). The general use of EMA information is for internal organizational calculation and decision-making (United Nations Division for Sustainable Development [UNDSD], 2001). EMA information for internal decision-making includes both: physical data for material and energy consumption, flows, and final disposal, and monetarised data for costs, savings, and revenues related to activities with a potential environmental impact. Many studies around the world have shown that EMA brings a lot of benefits to businesses. Specifically, IFAC (2005) pointed out that EMA supports companies enhance their compliance with laws and environmental policies, which in turn reduces negative impacts on the environment and saves costs in dealing with pollution issues. Kokubu and Kitada (2015) highlighted that EMA is an effective tool in building better relationships between businesses and stakeholders, providing complete and accurate information for decision-making, or it boosts the company's image, position, and reputation in the market (Zeng et al., 2010).

With the above analysis, the study of EMA application in Vietnamese cement companies is an issue that needs to be pursued. The research questions are:

RQ1: What factors affect the application of EMA in cement companies?

RQ2: What is the level of impact of those factors?

These are questions that leaders need to pay attention to in order to have reasonable policies to solve these obstacles. The article employs a combination of qualitative and quantitative research methods to conduct the study. Based on the research findings, this study contributes new knowledge by identifying factors influencing the adoption of EMA practices in Vietnamese cement companies. The recommendations provided serve as a robust scientific foundation for policymakers and managers to consider improvements aimed at enhancing the effectiveness of this accounting tool.

The structure of this paper is divided into five sections. Section 1 presents an introduction, Section 2 reviews relevant scholarly works and research hypotheses. Section 3 explains the methodology applied for the empirical study, research design, scales, sampling, sampling methods, and measurement instruments. Section 4 presents the results and discussion based on the analysis from the use of measurement instruments. Section 5 provides the conclusion and limitations of the paper.

2. THEORETICAL BASIS AND HYPOTHESES

Environmental management accounting is a branch of management accounting aimed at providing accounting information on the environment to assist managers in decision making, contributing to enhancing financial and environmental performance in businesses (Ngoc, 2017). This role is realized through a series of techniques employed by accountants, such as identifying, classifying, budgeting, determining, analyzing, and providing environmental information to help managers in making business decisions. Consequently, EMA supports businesses in controlling and saving costs, improving competitive capacity, and creating strategic advantages, especially given the current urgent social issues related to the environment.

Managers need to lead and manage their companies to achieve set goals; therefore, they consider the relationship between the benefits of any management tool they use. When managers understand the importance and benefits of

management tools or management accounting, applying these tools becomes feasible (Trang, 2019). Many previous studies have shown that the attention and support of senior management is crucial for the success of any environmental management activities (Henriques & Sadorsky, 1999; Zhu & Sarkis, 2004), as it relies on the management's ability to proactively develop strategies and plans, as well as the support from managers throughout the implementation process. Management awareness is one of the key factors in EMA activities (Kokubu & Nashioka, 2005), as managers choose policies and environmental strategies in business operations. Empirical studies by various authors have also demonstrated a positive impact of manager awareness to the application of EMA in different types of businesses, such as mining companies (Ngoc, 2017), livestock feed production companies (Hoc, 2022), and paper and pulp production companies (Nguyen, 2022). Thus, the following research hypothesis is proposed:

H1: Managers' awareness in enterprises positively influences the adoption of environmental cost management accounting.

EMA has emerged alongside theories of legitimacy, institutional theory, and stakeholder theory. This means that how businesses apply EMA is influenced by stakeholder pressure during their operations. These pressures come from regulatory bodies; non-governmental organizations that require companies to comply with environmental protection laws; pressures from holding companies or parent companies insisting on adherence to environmental regulations and obligations; and pressures from investors, shareholders, or credit institutions that demand transparency in environmental information and activities. Additionally, there is pressure from financial entities, such as banks, insurance companies, and other related parties with which the company has beneficial or cooperative relationships. The greater this pressure, the more tools a business needs to help address and balance these pressures, thus increasing the feasibility of implementing EMA. Qian et al. (2011) and Le (2017) applied legitimacy theory to assess the factors influencing the level of EMA adoption in companies, and their results showed that community pressure impacts the implementation of EMA. Similarly, Jamil et al. (2015) and Le (2017) showed that pressure from customers, suppliers, investors, and shareholders of large companies positively impacts on the application of EMA. Based on these analyses, we propose the following hypothesis:

H2: Pressure from stakeholders has a positive impact on the application of environmental management accounting.

In Vietnam, large businesses are defined by criteria related to investment capital, average revenue, and number of employees each year. Specifically, Decree No. 80/2021/ND-CP stipulates that a business is considered large if its revenue ranges from VND 20 to 100 billion, with an average number of employees between 200 and 300. These large businesses need to apply Circular 200/2014/TT-BTC guidelines for accounting policies for large-scale enterprises to meet the recording and information provision needs of the business. Numerous studies worldwide have demonstrated that the size of the enterprise (the organization) significantly has impacted the application of EMA (Christ & Burritt, 2013; Nair & Nian, 2017; Huyen-Tram & Toan, 2018; Tuyen, 2020; Nguyen, 2021). Social responsibility also encompasses environmental responsibilities in large enterprises, which receive more public attention and political scrutiny compared to small and medium-sized businesses. As a result, environmental information needs to be disclosed more transparently to meet stakeholder demands. Abdel-Kader and Luther (2008) and Hoque and James (2000) indicated that management systems in larger enterprises tend to be more complex and face more management issues; therefore, the amount of necessary information will be greater, highlighting the role of accounting. In large enterprises, especially in cement manufacturing, transparency regarding environmental protection measures, revenue, and corresponding annual costs is even more critical because of the industry's perceived environmental biases. Thus, they must implement EMA to create a positive social image, meeting the interests of communities, investors, and the government. The following hypothesis is proposed based on this analysis:

H3: The size of the enterprise positively influences the application of environmental management accounting.

The application of management accounting tools has been supported by many studies that show its influence on accounting proficiency (Trang, 2019). EMA is a specialized activity within management accounting carried out by accountants, so the expertise of accountants will affect both its implementation and effectiveness. However, EMA requires more complex knowledge and skills than regular accounting, which can be a barrier to its adoption in businesses. Research by Haldma and Laats (2002) and Ismail and King (2007) suggests that the level and experience of accounting staffs are related to the provision of accounting information, including that provided by EMA, meaning that EMA information will be received, processed, synthesized, and provided better when accountants have higher professional qualifications. According to Innes and Mitchell (1990), accountants implement accounting techniques and tools, which are crucial factors in the transformation of management accounting. When accountants have knowledge and experience, their ability to apply and the effectiveness of their work are higher, and vice versa. Therefore, the following hypothesis is established:

H4: Accountants' qualification positively impacts the implementation of environmental management accounting.

Cost or finance resource is a crucial factor in organization of any new system, and is one of the concerns for many businesses (Xuyen et al., 2022). When business leaders recognize and identify the need to apply EMA but the company lacks sufficient resources, its implementation becomes unfeasible. Despite the significant benefits of adopting EMA, the costs of organizing such a system are not small; Companies need financial resources to cover both the initial investment costs and the ongoing operating expenses of the system. These costs include expenses for infrastructure investment, information processing system investment, and then human resources to operate that system. (Xuyen et al., 2022). Therefore, finance resources have become a significant barrier preventing businesses from implementing EMA. Experimental research by various authors around the world, such as Wachira (2014), Jamil et al. (2015), and Nguyen (2021) has proven that this is one of the

barriers affecting adoption of EMA. Even though environmental awareness is growing, the lack of financial resources poses a considerable obstacle for small and medium-sized enterprises, in implementing EMA (Gadenne et al., 2009). Based on these arguments, the hypothesis is built as follows:

H5: Financial resources have a positive impact on the adoption of environmental management accounting.

The application of EMA is understood as the use of management accounting methods to perform environmental accounting tasks. The mission of EMA is to collect, process, synthesize, and provide accounting information related to environmental costs and income as well as other relevant data, thereby supporting managers in controlling management and making related decisions (Le, 2017). Therefore, the application of EMA involves identifying and classifying environmental costs, developing standards and budgeting for environmental costs, allocating environmental costs to each product and process, analyzing and controlling environmental accounting information, and preparing reports on environmental indicators.

3. METHODS AND RESEARCH DATA

3.1. Data collection methods

This study used both primary and secondary data-collection methods. Secondary data are sourced from published research works such as doctoral dissertations, published projects, scientific articles on EMA, and related research works. Primary data were gathered by creating a survey questionnaire that was sent to the relevant subjects. The quantitative research method is carried out based on a pre-designed questionnaire, and data is collected using the convenience sampling method. The questionnaire is designed using a 5-point Likert scale (ranging from 1 = "Strongly disagree" to 5 = "Strongly agree") and is administered through direct interviews, emailed, or mailed to individuals in Vietnamese cement companies.

The survey targets managers (directors, deputy directors, chief accountants), financial and management accounting staffs, knowledgeable about EMA, and managers from related departments, such as production, waste treatment, and legal departments within these cement companies. This group includes individuals who are well versed in internal control systems, financial management systems, compliance with environmental regulations, and awareness of pollution levels and pollution management in company operations. Therefore, they play a crucial role in implementing EMA within a business.

The questionnaires were sent from March to May 2024, with the number of survey questionnaires distributed based on the principle that the quantity must be five times the number of variables in factor analysis (Hoang & Chu, 2008). A total of 265 questionnaires were distributed, and 238 were collected, of which 205 were valid and included in the study. Table 1 presents the survey information summary.

Table 1. Survey information summary

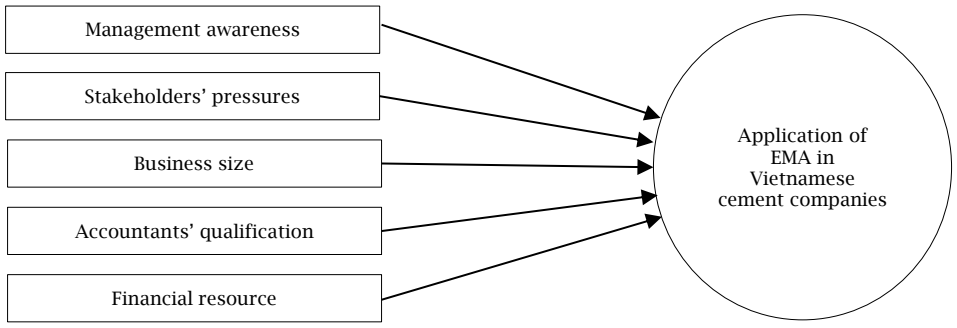
Criteria	*Content*	*Number*	*Proportion*
Gender	Male	140	68.29%
	Female	65	31.71%
Division	Board of management	45	21.96%
	Board of director	30	16.63%
	Finance-Accounting division	82	40%
	Other division	48	23.41%
Current position	Manager	95	46.34%
	Staff	110	53.66%

Source: Authors' elaboration.

3.2. Research model and proposed measurement scale

The research model was built using group discussion techniques with six members, including two accounting experts, two managers and two chief accountants of Vietnam cement companies. Besides, drawing on pertinent theories, prior study findings and the aforementioned analysis, the Authors suggest the subsequent research model (see Figure 1).

Figure 1. Research model



Source: Authors' elaboration.

The scale was established based on qualitative research results and references from previous studies, thereby inheriting and supplementing it to reach the research purpose. Each variable is built from 4–5 scales to fully cover the aspects that need to be evaluated of a research concept in a new research environment. Table 2 shows proposed scale used in research.

Table 2. Proposed scale

Variable	*Symbol*	*Scale*
Management awareness	*MA1*	Managers have knowledge of EMA.
	MA2	Managers see the benefits of applying EMA.
	MA3	Managers see the need for enterprises to apply EMA.
	MA4	Managers accept the costs of applying EMA.
Stakeholders' pressures	*SP1*	Enterprises must comply with legal regulations from State agencies (law, local authorities, competent agencies).
	SP2	Enterprises must comply with regulations from the corporation.
	SP3	Enterprises must comply with requirements from investors and owners of the company.
	SP4	Enterprises must comply with commitments to environmental organizations.
	SP5	Enterprises must comply with regulations from financial institutions (banks, credit institutions, insurance).
Business size	*BS1*	Enterprises with an average annual capital of over VND 100 billion.
	BS2	Enterprises with an average annual number of employees from 200 to 300 employees.
	BS3	Enterprises with an average annual revenue from VND 20 to 100 billion.
	BS4	Enterprises applying the accounting regime according to Circular 200/2014/TT-BTC issued on December 22, 2014.
Accountants' qualification	*ASQ1*	Accountants have good professional qualifications.
	ASQ2	Accountants have working experiences.
	ASQ3	Accountants have proficient job skills.
	ASQ4	Accountants have knowledge of EMA.
	ASQ5	Accountants are able to apply techniques and tools of EMA.
Financial resource	*FR1*	Enterprises have financial resources to invest infrastructure facilities serving EMA.
	FR1	Enterprises have financial resources to invest technical means for EMA.
	FR1	Enterprises have resources to maintain and repair facilities and technical means serving EMA.
	FR4	Enterprises have sufficient resources to train human resources for EMA.
Application of EMA	*EMA1*	Identifying and classifying environmental costs.
	EMA2	Developing norms and making environmental cost estimates.
	EMA3	Allocating environmental costs by product and process.
	EMA4	Analyzing and controling environmental accounting information.
	EMA5	Preparing reports on environmental management accounting.

Source: Authors' elaboration.

3.3. Data analysis

Data collected from the questionnaire was coded and preprocessed on Excel software. Afterwards, using Statistical Package for the Social Sciences (SPSS) as the statistical tool, this study looked at the structural model. For example, regression model analysis, exploratory factor analysis (EFA), Cronbach's alpha analysis, and descriptive statistics. Descriptive statistics are used to analyze samples (frequency) and respondents' assessments of factors affecting application of EMA. Values calculated in descriptive analysis include mean, standard deviation, frequency, and percentage.

Hair et al. (2010) have suggested that a scale is considered appropriate and reliable for research purposes if the Cronbach's alpha coefficient is above 0.7. The scale has used in this study meets this requirement, indicating that the research scale is both appropriate and reliable. To determine the relationship between independent variables and the dependent variable of the model, and to explore the relationships between several independent factors and one dependent variable, the paper employed multiple regression analysis. At the same time, standardized coefficients were used to assess the impact of these factors on the application of EMA in Vietnamese cement companies.

4. RESEARCH RESULTS AND DISCUSSION

4.1. Testing the reliability of the scale

The results have shown Cronbach's alpha for each group of factors affecting the application of EMA achieved high values above 0.7, showing that the factor groups are reliable and qualified for testing.

Table 3. Reliability statistics

No.	*Variable*	*Cronbach's alpha*	*No. of items*
1	*Management awareness*	0.908	4
2	*Stakeholders' pressures*	0.866	5
3	*Accountants' qualification*	0.792	4
4	*Business size*	0.804	5
5	*Financial resource*	0.830	4
6	*Application of EMA*	0.912	5

Source: Authors' data processing results.

Table 3 shows that the lowest Cronbach's alpha value belongs to the accountants' qualification factors, however, combined with the analysis data in Table 4, it shows that the Cronbach's alpha if item deleted value is lower than the overall value, which shows that when this variable is removed, the overall Cronbach's alpha value is not improved. Meanwhile, this value is 0.792, higher than 0.7, so it is eligible for testing. The Cronbach's alpha values of other factor groups are from 0.8 or higher, in which the highest is the group of factors applying EMA in enterprises with a value of 0.912, the second is the group of manager's awareness of EMA reaching 0.908, the group of factors pressure of related parties reaching 0.866, the fourth is the group of financial resources factors reaching 0.830 and the group of factors of enterprise size 0.804.

Table 4. Reliability statistics

Variable	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha if item deleted
ASQ 1	9.79	7.609	0.599	0.749
ASQ 2	9.90	7.927	0.554	0.771
ASQ 3	9.79	7.270	0.663	0.717
ASQ 4	9.82	7.561	0.613	0.742
ASQ 5	9.73	7.262	0.664	0.727

Source: Authors' data processing results.

4.2. Exploratory factor analysis

Keiser-Meyer-Olkin (KMO) index analysis is used to examine the suitability of factor groups. This index reaches a value of 0.848 with a significance level of Sig = 0.000, indicating that the application of EFA is appropriate (see Table 5).

The results of the Rotated component matrix analysis show five groups of factors with eigenvalues > 1, indicating that the application of EMA is affected by the five proposed factors (see Table 6). The factor analysis is based on Varimax rotation and communility ≥ 0.5, and the factor loading coefficients of the factor groups all have a value > 0.5, which is statistically significant and satisfies the selection criteria. The variables all have a positive relationship with the research aspect.

Table 5. Keiser-Meyer-Olkin and Bartlett's test

Kaiser-Meyer-Olkin measure of sampling adequacy.		0.848
Bartlett's test of sphericity	Approx. chi-square	2919.190
	Df	351
	Sig.	0.000

Source: Authors' data processing results.

Table 6. Rotated component matrix

Variable	Component					
	1	2	3	4	5	6
SP5	0.815					
SP1	0.773					
SP3	0.765					
SP2	0.749					
SP4	0.690					
MA3		0.888				
MA1		0.876				
MA4		0.787				
MA2		0.777				
EMA5			0.773			
EMA1			0.706			
EMA4			0.701			
EMA3			0.689			
EMA2			0.675			
ASQ5				0.762		
ASQ4				0.741		
ASQ2				0.737		
ASQ1				0.727		
ASQ3				0.648		
FR4					0.884	
FR3					0.825	
FR1					0.788	
FR2					0.723	
BS3						0.791
BS4						0.778
BS2						0.722
BS1						0.701

Source: Authors' data processing results.

4.3. Regression analysis

The regression analysis results show that the adjusted R^2 value (R-square) is 0.581 > 50% (see Table 7), which means that the research results have a variation within the range of 58.1% and Sig. = 0.00, and five independent variables explain 58.1% of the variation in the dependent variable. The value of the Durbin-Watson coefficient is 2.162, which is between 1 and 3, this value shows that there is no correlation between the variables and no multicollinearity because the F-test gives the result Sig. = 0.00 < 0.05, the coefficients table has VIF coefficients all < 10.

Table 7. Model summary

Model	R	R-square	Adjusted R-square	Std. error of the estimate	Change statistics					Durbin-Watson
					R-square change	F change	df1	df2	Sig. F change	
1	0.777	0.603	0.581	0.48839	0.603	55.317	5	182	0.000	2.162

Source: Authors' data processing results.

Table 8. Coefficients

Model		Unstandardized coefficients		Standardized coefficients	T	Sig.	Collinearity statistics	
		Beta	Std. error	Beta			Tolerance	VIF
1	(Constant)	-0.668	0.249		-2.629	0.009		
	MA	0.226	0.036	0.322	5.986	0.000	0.822	1.233
	SP	0.270	0.051	0.271	5.025	0.000	0.825	1.228
	BS	0.233	0.044	0.268	5.008	0.000	0.834	1.214
	ASQ	0.227	0.054	0.211	3.980	0.000	0.873	1.160
	FR	0.241	0.051	0.227	4.532	0.000	0.968	1.045

Note: Dependent variable: EMA.
Source: Authors's data processing results.

4.4. Discussion

The results show that the group of managers' awareness factors has the greatest impact on the application of EMA in Vietnamese cement companies. This means that to improve the feasibility of applying EMA in the corporation, the prerequisite is to improve managers' awareness of the importance and benefits of EMA; then, managers will proactively organize implementation. This has also been verified by the results of empirical research by many researchers in Vietnamese enterprises, such as Ngoc (2017), Hoc (2022), and Nguyen (2022).

The group of stakeholders' pressure factors is assessed to have the second largest level of influence in the application of EMA at the Vietnamese cement companies under significant pressure from related parties to implement environmental protection measures. Specifically, the regulations of the State Government and the Ministry of Industry and Trade on compliance with regulations such as: preparing environmental impact assessment reports, fully implementing the monitoring program, ensuring the surrounding environment and monitoring the quality of waste sources such as wastewater, exhaust gas; implementing the environmental management system according to ISO standards. This creates great pressure on cement companies, requiring full compliance with environmental regulations and transparency of information on environmental costs and revenues to achieve legality in operations and resolve pressures from related parties. EMA is an appropriate solution to resolve this pressure. It implies that managers of Vietnamese cement companies need to have a strategy to apply tools such as EMA to deal with pressures from stakeholders during operations. This result once again reaffirms the influence of pressure from stakeholders on the application of EMA in Vietnamese enterprises, such as the study by Le (2017) in brick manufacturing enterprises or the study by Nguyen (2022) in paper manufacturing enterprises.

In Vietnamese cement companies, the application of EMA and business size are confirmed to have a positive relationship. When the enterprise scale is large, the administrator must deal with a larger workload, thus requiring more support from related departments; the level of application of management tools is also more diverse, since the application of EMA also becomes more feasible. This implies that as the scale of businesses increases, managers of Vietnamese cement companies need to have strategies for selecting and utilizing tools like EMA to support effective business management.

Financial resources are the fourth most influential factor. This result shows that, although cement companies are large-scale enterprises, the application of management tools is always concerned with costs. If the cost of investing in technical facilities, machinery, and equipment, as well as maintenance, is too high, the feasibility will decrease. In addition, the cost of training human resources to implement EMA is also something that companies considered. This result is said to be similar to previous studies on the impact of financial resources on the application of management tools in general and EMA in particular within manufacturing enterprises in Vietnam (Xuyen et al., 2022), in Malaysia (Jamil et al., 2015) or in food and beverage enterprises in Vietnam (Nguyen, 2021). To increase the feasibility of applying management tools like EMA, managers of Vietnamese cement companies need effective strategies for mobilizing and developing financial resources.

The regression results show that the professional level of accountants is the final factor affecting the application of EMA in Vietnamese cement companies. This reaffirms that the accounting qualification has an impact on the application of EMA in enterprises which is tested in the study by Haldma and Laats (2002), Ismail and King (2007), Trang (2019). It implements that training and improving the professional qualifications of accountants in Vietnamese cement companies still needs to be focused on so that the application and implementation of EMA can be more effective.

5. CONCLUSION

The results show that the group of managers' awareness factors has the greatest impact on the application of EMA in Vietnamese cement companies. On that basis, the findings have proposed management implications to raise awareness among managers and chief accountants at Vietnamese cement companies by organizing seminars and conferences to discuss and introduce EMA, presenting lessons learned and benefits that cement companies worldwide have gained by adopting EMA. Once they have enough knowledge, those in leadership roles can then plan, hire experts and ensure a seamless implementation for the best results.

The pressure from stakeholders directly impacts the organization of EMA, the greater this pressure, the more the ability to implement increases. This points to Vietnamese authorities; as they strengthen and tighten the implementation of policy regulations governing business operations, the use of management tools in general and EMA in particular will become more significant, as compliance with legal regulations and stakeholder demands is always a top priority for the survival of cement companies.

Additionally, the research findings on the influence of financial resource factors and accounting proficiency on EMA highlight the necessity of accumulating financial resources and developing labor capabilities within companies. Cement companies need to diversify their means of fundraising and capital development, as this is a prerequisite for applying management tools. They also need to continually provide training and development for human resources, while maximizing the strengths of accounting personnel, regularly exposing them to and learning from experiences at forums and conferences to enhance their professional skills and work experience. This way, the application of EMA in Vietnamese cement companies will become more convenient.

In addition to the contributions mentioned above, this study was conducted in Vietnamese cement companies; therefore, the research results are not representative of all cement manufacturing enterprises as well as Vietnamese enterprises. In addition, there are still factors outside the proposed model that can affect the application of EMA in enterprises, such as factors related to the characteristics of the industry, business sector, type of ownership, factors related to management policies, and the economic growth rate of the locality. These limitations need to be further studied and clarified, leading to new results in subsequent studies.

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