



Received: 01-08-2023
Accepted: 10-09-2023

ISSN: 2583-049X

Studying the Model of Factors Affecting Applying Environmental Management Accounting in Manufacture Enterprises in Vietnam

¹Thi Lan Anh Do, ²Thi Thuy Thanh Le, ³Thi My Linh Dang

^{1,3} University of Labour and Social Affairs, Hanoi, Vietnam

² Trade Union University, Hanoi, Vietnam

Corresponding Author: **Thi Lan Anh Do**

Abstract

This article provides an overview and proposes a model of factors influencing the application of environmental management accounting in businesses. The author team analyzes several theories used in environmental management accounting research, including stakeholder theory, institutional theory, and contingency theory. Through qualitative methods, the identified factors include: stakeholder theory, institutional theory, contingency theory,

perception of business environment volatility, environmental strategy, and production technology. A comprehensive evaluation of the impacts of these influencing factors helps managers plan to promote the application of environmental cost management accounting to control costs, increase economic efficiency, and aim for sustainable development.

Keywords: Environmental Cost, Environmental Management Accounting, Sustainable Development

1. Introduction

The Earth Summit on Environment and Development held in Rio de Janeiro, Brazil, in 1992 and the World Summit on Sustainable Development held in Johannesburg, South Africa, in 2002 established that sustainable development is a process that tightly, reasonably, and harmoniously combines three aspects: economic development, social development, and environmental protection. The challenge for every country is to not underestimate or overemphasize environmental protection or economic and social development. Instead, all countries must ensure a balanced approach to these three elements of sustainable development. This is a tough task not only for underdeveloped countries but also for developed and developing ones. Traditional management accounting has some limitations regarding the understanding of improving operations through cost management, as environmental costs are being accumulated into a general account (UNSD, 2001; Rikhardsson & colleagues, 2005; Schaltegger & colleagues, 2008) [39, 35, 36]. To meet the pressures of reducing environmental impact during business production processes, new techniques are needed to help managers incorporate environmental information into accounting reports. Environmental management accounting is one of the important tools for supporting businesses to control environmental costs, increase economic efficiency, and aim towards sustainable development (Burritt & colleagues, 2009). Implementing environmental management accounting will help businesses standardize their business production activities, save natural resources, and reduce environmental impact, thereby enhancing the financial efficiency of the business. However, the application of environmental cost management accounting in manufacturing enterprises has not yet been properly addressed and implemented due to various reasons. This article focuses on studying the factors affecting the application of environmental management accounting in manufacturing enterprises.

2. Literature Review

Environmental management accounting has received and continues to receive significant attention in academic research as well as in professional international organizations and practical implementation in various organizations. This is clearly demonstrated through a large number of research works, articles in scientific journals, doctoral theses, books, and reference. Overview of research works on factors influencing environmental management accounting organizations shows that these studies are based on a few foundational theories, such as institutional theory, uncertainty theory, legitimacy theory, stakeholder theory, and contingency theory.

Studies by Chang (2007) [6], Godschalk (2008) [14], and Swart and colleagues (2008) [37] have pointed out that the perceptions of managers and government pressure are the biggest obstacles in deciding to implement environmental management accounting.

Kokubu & Nashioka (2005) ^[21] revealed through their research that the role of the environmental department in decision-making and the manager's perception are factors influencing the application of environmental management accounting. Bansal & Roth (2000) ^[2] also conducted an investigation into 53 businesses in England and Japan, concluding that businesses are driven by the legitimacy of stakeholders, which is considered the most influential factor in applying environmental management accounting. Additionally, the study also indicated that government regulatory pressure and organizational responsibility are significant influencing factors.

Recently, in Vietnam, there has been a growing interest in environmental management accounting research. However, the approach is still primarily focused on its importance and potential application, along with implementation guidelines. Some studies have concentrated on certain aspects of environmental management accounting (Le, K.N., 2013; Hoang, T.B.N., 2015). Some authors have evaluated the level and feasibility of applying environmental management accounting in specific industries, such as brick production (Le, T.T., 2017) or steel production (Nguyen, T.N., 2017; Nguyen, T.H.N., 2017) ^[29, 28] has researched the factors related to business characteristics that influence the implementation of environmental management accounting.

Le, T.T., (2017) incorporated business strategy into her research when studying the factors influencing environmental management accounting in brick manufacturing businesses. Government enforcement pressure, regulatory pressure, proactive environmental strategy, and community pressure have a positive relationship with the degree of application of environmental management accounting. Nguyen, T.H.N. (2018) also included business strategy and changes in the business environment in her research model on factors affecting the implementation of environmental management accounting.

Alongside this, the dramatic shifts in today's competitive business environment and advancements in manufacturing technology have some impacts on accounting. Studies on advanced manufacturing technology have been extensively researched by scientists since the 1990s, such as Mia and Clarke (1999) ^[27]; Yakou and Dorweiler (1995) ^[40]. These studies have shown that the application of advanced manufacturing technology can significantly improve quality, reliability, and flexibility in production (Kaplan, 1986; Schroder and Sohal, 1999) ^[20, 34], and also has a significant influence of advanced manufacturing technology factors on the implementation of environmental management accounting in businesses.

Results from various studies, both domestically and globally, have identified factors influencing the application of organizations. These include awareness of business environment fluctuations, task complexity, environmental strategies, coercive pressures, regulatory pressures, mimetic pressures, advanced production technology. However, most of these studies have not comprehensively considered all these factors. Moreover, findings from previous studies often show inconsistencies. For instance, some study results do not align with theoretical expectations or contradict arguments and findings from numerous authors in studies on factors influencing the application of environmental management accounting. Therefore, this article investigates and proposes a model of influencing factors based on three foundational theories: stakeholder theory, institutional

theory, and contingency theory for the application of environmental management accounting in manufacturing enterprises in Vietnam.

3. Rationable

Environmental Management Accounting

Environmental management accounting involves identifying, analyzing, and utilizing both financial and non-financial information to optimize a company's environmental issues and financial efficiency. This helps the business achieve sustainable development (Bennett and James, 1998).

The study of environmental management accounting primarily uses three theories: stakeholder theory, institutional theory, and contingency theory.

Stakeholder Theory

The theory of stakeholder involvement originated from Freeman's (1984) ^[13] research on organizational management and business ethics, "Strategic Management: A Stakeholder Approach". This theory suggests that organizations have a duty to treat all stakeholders fairly. In cases where stakeholders have conflicting interests, businesses must strive to achieve an optimal balance between them. As the needs of stakeholders vary and constantly change, organizations focus on meeting the needs of those with significant and direct interests, assuming that the interests of the remaining parties are also satisfied through the pursuit of business strategies and reporting information in line with social norms and values. This theory is used to explain why organizations choose and voluntarily apply environmental management accounting to meet the increasing demand for environmental information from government agencies, credit institutions, investors, consumers, and the community.

Institutional Theory

Institutional Theory refers to the changes in an organization's behavior (like altering models, strategies, processes, methods, techniques, etc.) due to the influence of external pressures and how organizations can adapt to survive and grow legitimately (Ninh, T.K.T., 2015).

Institutional theory can be used to explain the application of environmental management accounting in businesses. Some authors who have studied environmental management accounting have applied institutional theory, such as Bourma and Van der Veen (2002) ^[3], Chang and Deegan (2010) ^[7], Qian and colleagues (2011) ^[32], Jalaludin and colleagues (2011) ^[22], and Jamil and colleagues (2015) ^[23]. The legal and socially accepted behavior of an organization can originate from various mechanisms, like imitation, learning, or being forced. Scott (1995) grouped the 3 factors (3 pillars) of institutional theory into: the regulatory pillar (coercive pressure), the normative pillar (normative pressure), and the cognitive pillar (mimetic pressure).

The authors point out that non-governmental organizations, especially those advocating for the environment, play a significant role in promoting the development of environmental accounting at local governments. According to Ball's (2005) observations in Canada, when society is stirred by environmental consciousness, environmental management accounting is implemented to respond to societal changes. Thanks to the shift in the level of connection between organizations and their institutional environment, differences in the implementation of

environmental accounting will occur. If the community gets more involved in protecting the environment, it will encourage organizations and individuals to change their behavior when implementing environmental management accounting.

Contingency Theory

Contingency Theory is a popular theory used in management accounting research. It was developed in the mid-1960s and was adopted by management accounting researchers from the 1970s to the 1980s. Contingency theory holds significant importance in management accounting research as it has dominated accounting behavior since 1975. Moreover, contingency theory is widely used in Otley's (1980) management accounting research.

In the last two decades of the 20th century, management accounting researchers shifted their focus to variables like strategy (Langfield-Smith 2006) and technology, which greatly influenced management accounting studies. Technological changes adopted by organizations often lead to changes in their management accounting requirements. Moreover, applied research in accounting suggests that factors related to business environment volatility and business environment strategy influence the choice of accounting information systems (Hutaibat, 2005)^[19]. Other authors agree that business strategy is a significant factor influencing the design of accounting information systems and the process of accounting innovation (Chandler, 1990; Do, T.L.A., 2020)^[5, 11].

4. Factors Influencing the Implementation of Environmental Management Accounting in Businesses

Pressure from stakeholders

Institutional theory and stakeholder theory suggest that pressures from stakeholders such as the government, financial institutions, environmental organizations, communities, and local authorities compel businesses to implement environmental management accounting at various levels to ensure legality (compliance with standards and social values) in their operations. This has been empirically proven by researchers. Kokubu and Nakajima (2004), Chang (2007)^[6], Jalaludin *et al.* (2011)^[22], Pham *et al.* (2010)^[30], and Jamil *et al.* (2015)^[23] all found that compliance with environmental regulations to minimize costs or coercive pressure is a driving factor for businesses to apply environmental cost management accounting. Besides coercive pressure from legal and governmental agencies, businesses also face pressure from stakeholders such as consumers, shareholders, credit organizations, and banks regarding the disclosure of environmental information. These pressures may stem from coercion or the voluntary actions of businesses to implement environmental strategies that align with standards and social values. Neu, Warsame, and Pedwell (1998) pointed out that the demand for environmental disclosure by companies is more influenced by financial entities and government agencies than by environmental protection organizations. Burritt *et al.* (2002)^[4] and Pham *et al.* (2010)^[30] showed that pressure from consumers affects the ability to apply environmental cost management accounting, while Alkisher (2013) argued that pressure from financial report users positively influences the application of this type of accounting.

Businesses operate in relationships with various stakeholders. Companies that are responsible for these

stakeholders can reap sustainable benefits (Clarkson, 1995). The expectations and pressures from these stakeholders significantly influence the company's environmental protection behavior and compliance with environmental regulations, promoting environmental management accounting within businesses. Studies on environmental accounting consider stakeholder theory as an important foundation. Business operations are increasingly concerned with social benefits and environmental protection. Companies are encouraged to incorporate socially responsible behaviors into their business strategies (Phan, T.T.H., 2019)^[31].

Coercive Pressure

Scott (1995), coercive pressure involves powerful institutions establishing rules, checking compliance, and if necessary, applying sanctions (rewards or punishments) to influence organizations and individuals. This coercive pressure can come from relevant parties through persuasion, obligation, or immediate demands. Adhering to these rules, standards, and commands can help an organization survive and grow, while non-compliance could lead to reduced income, damaged reputation, or even loss of operating license (Oliver, 1991).

Normative Pressure

Normative pressure refers to common social standards, including unwritten principles and values that have been "morally control" by social activists (Scott, 1995). By adhering to these common standards, an organization's behavior will be socially accepted and hence, these behaviors will become the norm in thought and action (Covaleski and Dirsmith, 1988)^[9].

The logic of normative pressure is based on compatibility. It's about how a situation aligns with the demands of a certain context, meaning what individuals or organizations would do when placed in that situation. So, according to the standard pillar, organizations adhere to rules and shared values because they feel obligated to do so, not because of economic benefits or operational efficiency.

In this study, normative pressure represents the requirement for organizations to comply with professional standards, regulations, principles and ethics. This is carried out through education and professional associations.

Mimetic Pressure

Mimetic pressure, when a behavior or rule is adopted and accepted within an organization, leads members to act according to popular standards to avoid standing out or drawing attention from others. The mechanism of this pressure is the imitation of activities generated within the network of social relationships.

When faced with uncertainty about their mission or goals, organizations tend to adopt processes, methods, technologies, or models used by those considered successful or legitimate, and mimic these organizations, rather than questioning their value (DiMaggio and Powell, 1983)^[10]. Thus, the pressure to imitate is a business's societal response to mimic other organizations in adopting techniques or methods that have been accepted, applied, or are seen as industry standards (DiMaggio and Powell, 1983^[10]; Ninh, T.K.T., 2015).

In this study, the mimetic pressure reflects the stress organizations face in seeking out societal role models to

learn from the activities, models, processes, methods, and techniques of those successful organizations.

Awareness of Business Environment Fluctuations

According to Chenhall (2003)^[8], the business environment is an inevitable factor in random theory. When an organization's environment is dynamic and unstable, it's more likely that the organization will apply a control system with flexible information flows to encourage innovation. Thompson (1967)^[38], Gordon and Narayanan (1984)^[15], and Gul and Chia (1994) perceive business environment volatility as an awareness of the unpredictable nature of the environment. In this study, the perception of business environment volatility is used to represent the attributes of the business environment due to the widespread application of this term in management accounting research (Chenhall, 2003)^[8]. Here, the concept of perceiving business environment volatility is understood as the awareness of the degree to which future states of the business environment are uncontrollable or unpredictable.

Environmental Strategy

Govindarajan and Gupta (1985)^[17]; Simons (1987) sought to expand the random factors in analyzing the relationship between a business's strategy and its management accounting system design. Previous studies implied that the design of the management accounting system depends on the business's strategic choices. Langfield-Smith's (1997)^[24] research showed that the management accounting system is designed to ensure the correct implementation of an organization's strategy. The more aligned the management accounting system is with the strategy, the more likely the organization can achieve its goals.

Rao and Krishana's (2009)^[33] research suggests that strategy is a company's overall plan, aiming to deploy resources to establish a favorable position and successfully compete with other rivals. In other words, a strategy outlines a framework and action plan for the company, detailing how to deal with changes in the external environment and competitive opponents. Within the scope of this study, the business strategy is confined to environmental strategies.

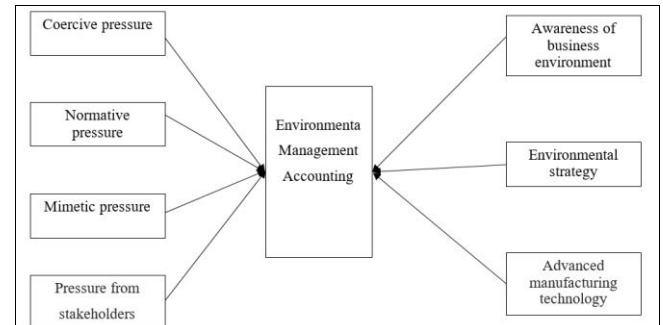
Essentially, an environmental strategy is a comprehensive plan related to a company's environmental activities, aiming to deploy resources to establish a favorable position for the business. This includes adhering to environmental regulations, developing environmental protection solutions, striving to provide environmentally friendly products, and achieving environmental certifications.

Advanced Manufacturing Technology

Alongside this, the dramatic shifts in today's competitive business environment and advancements in manufacturing technology have some impacts on accounting. Studies on advanced manufacturing technology have been extensively researched by many scientists since the 1990s, such as Mia and Clarke (1999)^[27]; Yakou and Dorweiler (1995)^[40]. These studies have shown that the application of advanced manufacturing technology can significantly improve quality, reliability, and flexibility in production (Kaplan, 1986; Schroder and Sohal, 1999)^[20, 34], and also have a significant influence of advanced manufacturing technology factors on the implementation of environmental management accounting and environmental cost management accounting in businesses. According to Che Ruhana Isa and colleagues

(2005), Drury and colleagues (1998), Thi Lan Anh Do (2020), if advanced manufacturing technology is increasingly applied, it will lead to an increase in the application of management accounting.

Based on the factors identified, the author proposes a model of factors influencing the application of environmental management accounting in manufacturing enterprises as follows:



Source: Compiled by the author's team

Fig 1: Proposed Model

5. Conclusion

In recent years, environmental issues and sustainable development have become globally relevant topics. Environmental management accounting has been and continues to be applied in businesses across various economic sectors, with a particular focus on industries that have a significant impact on the environment (such as mining, cement, chemicals, etc.). The challenge for businesses and organizations is to accurately assess influencing factors to apply appropriate environmental management accounting, helping control and save costs, and increase economic efficiency in resource utilization. Businesses need to adopt proactive environmental strategies (aiming at controlling environmental costs, reducing environmental impact, sustainable development strategies), be conscious about resource conservation and seek environmentally friendly alternative input materials, research technical improvements, implement modern production processes, reduce waste and emissions, and minimize environmental impact. To achieve this, the participation of government regulatory agencies is needed in perfecting the legal document system, providing comprehensive guidelines, stabilizing regulations on environmental management; there should be incentives and rewards for businesses that perform well in environmental matters.

6. References

1. Bahramfar N, Khajavi S, Naemi A. Identify barriers to development in management accounting manufacturing companies listed in Tehran stock exchange, *Journal of Development and Investment*. 2007; 1:93-116.
2. Bansal P, Roth K. Why companies Go Green: A Model of Ecological Responsiveness, *Academy of Management Journal*. 2000; 43(4):717-736.
3. Bouma JJ, Vander Veen M. Wanted: A Theory for Environmental Management Accounting, in Bennett, M., Bouma, J.J. and Wolters, T. (eds), *Environmental Management Accounting: Informational and Institutional Development*, Kluwer Academic Publisher, Dordrecht, 2002, 279-290.

4. Burritt R, Hahn T, Schaltegger S. Towards a Comprehensive Framework for Environmental Management Accounting Links-Between Business Actors and Environmental Management Accounting Tools, *Australian Accounting Review*. 2002; 12(2):39-50.
5. Chandler AD. *Strategy and structure: Chapters in the history of the industrial enterprise*, MIT Press, Cambridge, UK, 1990.
6. Chang HC. *Environmental Management Accounting Within Universities: Current State and Future Potential*, Unpublished PhD Thesis, RMIT University, 2007.
7. Chang H, Deegan C. Exploring factors in uencing environmental Management Accounting adoption at RMIT University, Sixth Asia Pacific Interdisciplinary Research in Accounting (APIRA) conference, Sydney, Australia, 2010, 11-13.
8. Chenhall RH. Management control systems design within its organizational context: Findings from contingency-based research and directions for the future. *Accounting, organizations and society*. 2003; 28(2-3):127-168.
9. Covalski MA, Dirsmith MW. An Institutional perspective on the rise, social transformation and fall of a university budget category, *Administrative Science Quarterly*. 1988; 33:562-587.
10. DiMaggio P, Powell W. The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review*. 1983; 48(2):147-160.
11. Do, TLA. The influence of contingency theory on the application of environmental management accounting in enterprises, *Journal of Finance*. 2020; No. 737 (2nd issue, September 2020):67-72.
12. FEM, FEA. *Guide to Corporate Environmental Cost*, Federal Environment Ministry and Federal Environment Agency, Berlin, 2003.
13. Freeman R. *Strategic Management: A Stakeholder Approach*, Pitman, Boston, 1984.
14. Godschalk SKB. Does Corporate environmental accounting make business sense? In Schaltegger, S., Bennett, M., Burritt, R. and Jasch, C (eds), *Environmental Management Accounting for Cleaner Production*, Published by Springer. 2008; 24:249-265.
15. Gordon LA, Narayanan VK. Management accounting systems, perceived environmental uncertainty and organization structure: An empirical investigation. *Accounting, organizations and society*. 1984; 9(1):33-47.
16. Gosselin M. The effect of strategy and organizational structure on the adoption and implementation of activity-based costing, *Accounting, Organizations and Society*. 1997; 22(2105-122).
17. Govindarajan V, Gupta AK. Linking control systems to business unit strategy: Impact on performance. In *Readings in Accounting for Management Control*. Springer, Boston, MA, 1985, 646-668.
18. Hoang TBN. *Environmental cost management accounting in oil and gas processing enterprises under the Vietnam National Petroleum Group*, Doctoral thesis in economics, ThuongMai University, Hanoi, 2016.
19. Hutaibat KA. *Management accounting practices in Jordan: A contingency approach*, Ph.D Dissertation, Unpublished, University of Bristol, Bristol, UK, 2005.
20. Kaplan RS. Must CIM be justified by faith alone? *Harvard Business Review*, March-April, 1986, 87-93.
21. Kokubu K, Nashioka E. Environmental management accounting Practices in Japan, in Rikhardsson, P., Bennett, M., Bouma, J. and Schaltegger, S. (eds), *Implementing Environmental Management Accounting: Status and Challenges*, Springer, Dordrecht, Netherlands. 2005; 18:321-341.
22. Jalaludin D, Sulaiman M, Ahmad NNN. Understanding environmental management accounting (EMA adoption: A new institutional sociology perspective, *Social Responsibility Journal*. 2011; 7(4):540-557.
23. Jamil CZM, Mohamed R, Muhammad F, Ali A. *Environmental Management Accounting Practices in Small Medium Manufacturing Firms*, *Procedia-Social and Behavioral Sciences*. 2015; 172:619-626.
24. Langfield-Smith K. Management control systems and strategy: A critical review. *Accounting, organizations and society*. 1997; 22(2):207-232.
25. Le KN. *Environmental cost accounting in businesses, National scientific conference: Vietnam accounting and auditing 20 years of reform and integration*, Kinh University Press National International, Hanoi, 2016, 237-242.
26. Le TT, Nguyen H. Factors affecting environmental cost management accounting in brick manufacturing enterprises' National scientific conference: Vietnamese accounting and auditing 20 years of reform and integration, National Economics University Publishing House, Hanoi, 2016, 228-236.
27. Mia L, Clarke B. Market competition, management accounting systems and business unit performance, *Management Accounting Research*. 1999; 10:137-158.
28. Nguyen THN. Characteristics of companies and the level of implementation of environmental management accounting at manufacturing enterprises in Vietnam, *Journal of Accounting and Auditing*, No. 12/2017. 2017; (171):53-56.
29. Nguyen TN. *Environmental cost management accounting in steel manufacturing enterprises in Vietnam*, Doctoral thesis in economics, National Economics University, 2017.
30. Pham DH. *Research on solutions to apply environmental accounting in manufacturing enterprises in Vietnam*, scientific research at ministerial level, 2010.
31. Phan TTH. The impact of corporate social responsibility on financial performance in Vietnamese textile and garment enterprises, Doctoral thesis in economics, National Economics University, 2019.
32. Qian W, Burritt R, Monroe G. *Environmental Management Accounting in Local Government: A case Waste Management, Accounting, Auditing & Accountability Journal*. 2011; 24(1):93-128.
33. Rao VSP, Krishana VH. *Management: Text and Cases*. Excel Books India, New Delhi, 2009, 250-260.
34. Schroder R, Sohal AS. Organisational characteristics associated with AMT adoption: Towards a contingency framework, *International Journal of Operations & Production Management*. 1999; 19:1270-1291.
35. Rikhardsson P, Bennett M, Bouma J, Schaltegger S. *Implementing Environmental Management Accounting: Status and Challenges*, Springer, Dordrecht,

- Netherlands. 2005; 18.
36. Schaltegger S, Bennett M, Burritt R, Jasch C. Environmental Management Accounting for Cleaner Production, Published by Springer. 2008; 24.
 37. Swart MM, Coetzee F, Blignaut J. Sustainable Development in the South African Mining Industry: The Role of Cleaner Production and EMA', In Schaltegger, S., Bennett, M., Burritt, R. and Jasch, C (eds), Environmental Management Accounting for Cleaner Production, Published by Springer. 2008; 24:165-191.
 38. Thompson J. Organisations in Action, New York: Mcgraw-Hill, 1967.
 39. UNDSO, Environmental Management Accounting: Procedures and Principles, United Nations Division for Sustainable Development, Newyork, 2001.
 40. Yakou M, Dorweiler VP. Advanced cost management systems: An empirical comparison of England, France and United States, Advances in International Accounting. 1995; 8:99-127.