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Research paper

Environmental Management Accounting Practices Interceding Between Environmental Proactivity and Environmental Performance: A PLS-SEM Approach

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Abstract

This study looks at how environmental management accounting procedures (EMA) affect the link between a company's environmental proactivity (Envpro) and its environmental performance (EP). For the study, 341 people who work in manufacturing in Oman filled out a questionnaire. After looking at the respondent and business profiles, the study's structural model's latent variables and the proposed research hypotheses were tested for reliability and validity. For SEM data analysis, researchers employed PLS-SEM. Envpro doesn't influence EP directly, but it does affect EP indirectly through EMA. Even though EMA practices make EP better. The data also showed that ownership structure, firm size, and age positively influenced EP. This is the first study to examine how EMA affects the link between Envpro and EP in Oman.

Keywords: *Environmental Proactivity; Environmental Management Accounting Practices; Environmental Performance; PLS-SEM.*

1. Introduction

Many environmental issues, such as water pollution, urban air pollution, loss of biodiversity, excessive atmospheric haze, and deforestation, are increasing nationwide, due to which a large number of companies are changing their business practices, so that they can combat or reduce these issues (Junquera & Barba-Sánchez, 2018; SAN et al., 2018). In some countries, the more environmentally engaged factories are rewarded with incentives and rebates, such as duty exemptions and green tax incentives. Environmental management practices currently need to be deliberately targeted at decreasing the adverse effects on the natural environment, and they involve both technological and organizational activities (Kadir, AlBalushi, & Javed, 2025). This is because of the nature of the modern world (Cramer, 1998) while maintaining the competitiveness of the firms (González-Benito & González-Benito, 2005). Therefore, companies must be more environmentally proactive by designing and implementing environmentally friendly products and processes, and simultaneously informing the general public about their positive environmental effects (Wisner et al., 2009; Zhang et al., 2019). The companies must be environmentally proactive to build a green image, which can enhance their competitive advantage and perform better (Junquera & Barba-Sánchez, 2018; Shrivastava, 1995). Hence, there is a link between proactively working for the environment and the EP of the firms (Javed, S. 2023). EP is gaining popularity among academics and companies due to the increasing environmental concerns caused by commercial activity. (Chaudhry & Amir, 2020). EP is the extent to which the business can control the environmental effects, which defines how the firm takes the initiative to mitigate these adverse effects to protect the environment (Phan & Baird, 2015). Modern firms are measuring their performance precisely in terms of the EP due to their commitment to the business's environmental impacts (Latan et al., 2018). This implies that the firms must build up their EP to survive and sustain the pressures and challenges of the competitive business environment. Hence, they need effective ways by which the EP can be optimized. In doing so, EMA needs to be implemented to develop, manage, and improve the environment-related activities of the firms' operations (Fuzi et al., 2019; Saeidi et al., 2011). These practices are in the limelight now as they enable a business to identify, select, and manage the best environmental information for improved decision-making. (Tashakor et al., 2019). Therefore, this study will address how EMAs can contribute more towards an environmentally proactive firm's EP.

Previous studies have highlighted a firm's importance in being environmentally proactive to contribute to its EP (Junquera & Barba-Sánchez, 2018). However, the literature on proactive environmental business is limited and needs further investigation (Zhang et al., 2019). Moreover, there is a need to incorporate EMA practices in Pakistan, a developing country, which is a significant gap. However, implementing EMAs is vital to create environmental awareness and assess the environmental impact (Fuzi et al., 2019; Jamil et al., 2015), but

the associated literature is scanty, which calls for further research. In a study by the authors stressed the adoption of environmentally friendly operational activities by the firms and systems to account for them through EMAs for the manufacturing industry of developing nations. Therefore, the author has selected the manufacturing industry for this study, and hence, this study tries to bridge these gaps in the literature by investigating the role of a firm's Envpro on its EP. Specifically, this study addresses the following research objectives:

- Evaluate the influence of Envpro on the EP.
- Evaluate the influence of Envpro on EMA practices.
- To investigate the role of EMA practices as mediators between Envpro and EP.
- Examine the effect of contextual elements on the firm's economic performance.

This work makes a substantial theoretical addition by establishing the mediating role of EMAs in the relationship between Envpro and EP, which has consequences for enterprises and policymakers. The study's findings provide guidelines for manufacturing firms to implement the steps for Envpro and EMAs to improve their EP. The results are also beneficial for the government as policymakers for the manufacturing industry, not only for creating awareness of important factors for improving the EP, so that the environmental issues can be integrated into their decision-making.

This paper establishes the research and gives its context in the first part, and the second part presents a comprehensive literature review of the study variables. The following section describes the research methodology for the study, followed by the results and the interpretation of the statistical analysis. Towards the end of the paper, the author highlighted the study's conclusion, limitations, and recommendations for future studies.

2. Literature Review

2.1. Legitimacy theory

This study is based on the legitimacy theory, which is a system-oriented theory, implying that the firms have the propensity to either influence society or be influenced by society, as proposed by (Watts & Zimmerman, 1986). Hence, the firms must assess whether they are functioning according to societal norms. Through the viewpoint of this theory, firms voluntarily control their activities in a way that is expected, relying on the concept of 'social contract,' which states that a social contract exists between the firm and society. Legitimacy theory develops an association between the EMA and the environmentally proactive firm's responsibility towards the environment (Mousa & Hassan, 2015).

2.2. Review related to envpro and EP

Envpro can be comprehensively defined as those voluntary initiatives and practices implemented that are aimed at enhancing the EP (Junquera & Barba-Sánchez, 2018). This comprises the competitive capabilities that can characterize ideal environmental practices by transforming or redesigning their products and operational processes to reduce the negative impacts on the environment (Porter & Van der Linde, 1995). When a firm implements proactive environmental strategies, it can minimize pollution, reduce waste, and use cleaner and greener technologies to lessen the negative environmental impact (Forés, 2019). From the managers' perspective, these initiatives include activities and strategies, such as planning and controlling operations, and involving employees being the human capital for their implementation (Hart & Dowell, 2011). The apparent justification for these strategies is the long-term contribution of a firm's Envpro towards the firm's environmental profitability (Brulhart et al., 2019; Ong et al., 2019; Zhang et al., 2019). The Envpro can also refer to the firm's willingness to volunteer for environmental management practices (Chaudhry & Amir, 2020). This shows that if a company does not voluntarily get involved in adopting appropriate environmental strategies, it can control the adverse effects more efficiently. Hence, with this aim, a firm may incorporate various strategies, such as reducing its costs, as a proactive environmental strategy, such as improving efficiency, reducing waste, and complying with legal responsibilities (Hart & Dowell, 2011).

Numerous earlier studies have shown that functional strategies and innovative activities for preserving the natural environment can create unique capabilities for firms and improve the quality of their products, thereby boosting their reputation (Azzone & Noci, 1998). Such firms are willing to invest in protecting their surroundings and tackling environmental problems (Aggeri, 1999). In other studies, the researchers have highlighted the importance for managers to develop new and innovative products through environmentally-friendly processes incorporated into their operations and supply chain to make the most of the competitive advantage, leading to higher EP (Forés, 2019; Junquera & Barba-Sánchez, 2018; SAN et al., 2018). Previous studies by (Alt et al., 2015; Wisner et al., 2009; Zhang et al., 2019) have also confirmed positive associations between the Envpro and EP; hence, the following hypothesis can be generated:

H1: Envpro has a significant effect on the EP

2.3. Review related to EnvPro and EMA

The EMA, an extension of management accounting (Jasch, 2006), has an important impact on the environmental management system and decisions as it contributes to processes such as procurement, production, and budgeting. Therefore, EMAs refer to identifying, allocating, generating, and using the physical and monetary information related to the environment to support their decision-making while preserving the environment and achieving a sustainable business (SAN et al., 2018). Firms under the liability of observing the regulations related to compilation, monitoring, and commitment to the environment also incorporate effective EMA. Moreover, scholars have identified that improving safety awareness, understanding the associated procedures, and the provision of environmental safety also constitute practices that may contribute to increasing the EP (Fuzi et al., 2019). However, it is essential to mention here that EMPA is, thus, able to foster firm performance by transmitting the EMA practices for firms that are actively engaged and proactive in implementing environmental strategies (Arda et al., 2019). Therefore, for this study, EMA is measured in terms of the environmental cost, environmental regulation, environmental safety, and management commitment to its impact on the EP. The discussion shows that Envpro leads to effective EMA. Hence, the hypothesis.

H2: Envpro has a significant effect on EMA.

2.4. Review related to EMA and EP

The EMA includes actions, such as integrating the environmental information with the costs, so the firm can better face its environmental responsibilities. (Christmann, 2000). The organizations can develop a system that supports environmental strategies and ensures alignment with the corporate decision-making for addressing environmental issues (SAN et al., 2018). However, commitment from the top management is required for the same, especially for firms willing to be more proactive for environmental causes; otherwise, the environmental objectives will not be fulfilled (Colwell & Joshi, 2013). Previous studies show that EMA positively affects organizational performance (Gunarathne et al., 2021; SAN et al., 2018). Further, some scholars found that implementing EMA helps the manufacturing firm enhance its performance by reducing environmental costs (ECs), increasing the use of green and renewable energy sources, and improving environmental management(Javed, Husain, Mohammed, Khan, & Nazir, 2025). In a study by (Arda et al., 2019)It was discovered that the environmentally proactive firms use the EMA to increase their profits. (Ghasemi et al., 2016) also labeled EMA to be an important tool for improving the EP of an organization. One such study by Javed (2023) examines the adoption of EMA in India's manufacturing sector, highlighting its positive impact on environmental, financial, and social performance. Similarly, research by Huy and Phuc (2024) explores the interconnection between EMA practices and strategic resilience in small and medium enterprises, emphasizing the role of green innovation complexity. Additionally, Alnaim and Metwally (2024) investigate the influence of institutional pressures on EMA adoption, revealing the moderating effect of environmental strategy.
However, we also acknowledge studies that report mixed or insignificant results regarding the EMA-EP relationship. For instance, a study by Liu et al. (2019) found inconsistent effects of EMA on EP across different industries. These conflicting findings underscore the importance of contextual factors, such as firm size, ownership structure, and industry characteristics, in influencing the effectiveness of EMA practices. Therefore, we can hypothesize that:
H3: EMA has a significant effect on the EP

2.5. Mediating role of EMA practices

Research based on operational, financial, environmental, and general management input at firms listed on the Indonesia Stock Exchange indicated that EMA directly mediates the beneficial connection between environmental strategies and EP (Solovida & Latan, 2017). Firms may use EMA to their advantage by realizing the competitive advantages of EP (Gunarathne et al., 2021; Jermsittiparsert, 2020). Based on what has been said, it is hypothesized that Envpro acts as a mediating variable that causes EP via EMA procedures. As a result, we postulate that EMA practices play a mediating role in this association.:
H4: EMA mediates the relationship between Envpro and EP.

2.6. Contextual factors (firm size, firm age, and ownership structure)

The study also includes a few contextual factors that are likely to have an impact on the EP. These factors comprise firm size, firm age, and ownership structure. The firm's size is determined by assessing whether the firm has adequate capacity to organize its operational activities (Liu et al., 2019). According to previous studies, there is more adaptability of EMA in large firms compared to smaller ones (Cadez & Guilding, 2008). This is because a firm needs specialists and a higher level of resources when it plans to shift from simple to more complex and sophisticated environmental practices, which large organizations can usually afford. These firms adapt to investing in environmental activities as they badly need to build and maintain their reputation (SAN et al., 2018) and thereby have a higher potential for growth. As the number of staff members is also higher in large firms, they can promote their activities using this human capital (Liu et al., 2019). Therefore, firm size can have a significant impact on EP.
A recent study shows that mature firms. i.e., the ones who have spent many years in the business are usually able to achieve a competitive advantage relative to the younger firms, as they are more experienced (Younis & Sundarakani, 2019). In a study (Russo, 2009)The author proved that the early adopter firms perform better than the late adopters, and the more time the firm takes to operate the environmental management systems, their performance will be. Previous research confirmed that the ownership structure of a firm increases its financial and EP by reflecting the improvement in the natural surroundings with the support of environmental management tools (Dintimala & Amril, 2018; Liu et al., 2019). In practice, the ownership structure influences the direction of corporate environmental management and may improve results. Efficiency-wise. (Liu et al., 2019) In their research, they analyzed the ownership structure of companies in terms of state-owned property, the number of independent directors, the number of state-owned shares, ownership concentration, and the shareholding percentage of the biggest and second-largest shareholders.
Consequently, the ownership structure (public or private) might affect the businesses' economic performance. Based on these reasons, we will examine the impact of firm age, business size, and firm ownership structure on the EP.

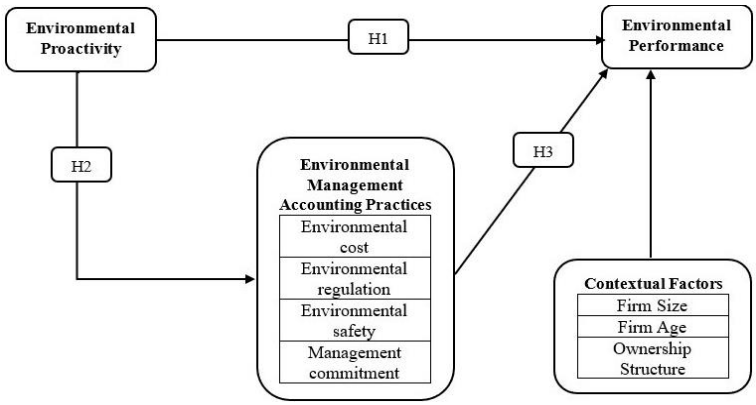

Fig. 1: Research Model.

Figure 1 illustrates the relationship between Environmental Proactivity, Environmental Management Accounting Practices, and Environmental Performance, highlighting how a firm's proactive environmental approach (Environmental Proactivity) influences its adoption of sustainable accounting practices
(Environmental Management Accounting Practices), which in turn improves its overall environmental performance. Additionally, Contextual Factors like firm size, age, and ownership structure are shown to influence both the adoption of these practices and the resulting performance. The model highlights the interconnectedness of these elements, illustrating how proactive strategies yield improved environmental outcomes, while contextual factors influence these dynamics.

3. Research Methodology

3.1. Data collection method

The population for this study consists of the manufacturing industry located in Oman. Hence, the unit of analysis is "manufacturing company." The required data was gathered using an online survey of 375 employees working in manufacturing companies. The total number of responses received was 350, which makes the response rate 93.3%. After scrutiny of the survey, it was found that only nine surveys had missing values; hence, after eliminating them, the sample size was finalized to be 341. This is to the recommendations of (Hair, 2009), which is a sample size of 100–500 for using the SEM technique for hypothesis testing (Amir, Javed, & Hisam, 2025). The data was collected from the respondents who were working as senior and middle-level managers. The items on the questionnaire were adopted from those used in the previous studies for recording the responses on Environmental Proactivity, EMA, and EP. The following scales were used in this study for the variables:

- EMA was measured in terms of EC with five items, environmental regulation (ER) with five items, environmental safety (ES) with five items, and management commitment (MC) with five items as well, and was taken from the scale of (Fuzi et al., 2019).
- Envpro was measured on a scale (Barba-Sánchez & Atienza-Sahuquillo, 2016) with a total of 12 items in terms of its three dimensions, namely Environmental Planning and Analysis (EPA) with four items, Environmental Responsibility & Organization (ERO) with three items, and Environmental Management Control (EMC) with five items, is a multi-dimensional construct.
- EP was measured with the scale of (Gunarathne et al., 2021) with eight items.

3.2. Data analysis method

Initially, the sample is tested for descriptive statistics analysis to determine the percentage and frequency distribution. Next, the profile of respondents was analyzed using a frequency distribution. Finally, hypothesis testing was carried out using the SEM approach to assess the variables' direct and indirect effects. The data were analyzed with SEM using AMOS's latest version after entry into IBM SPSS Statistics (Rafique, Javed, Amir, Shaukat, & Alzoubi, 2025). SEM is a statistical technique for testing the relationships between exogenous and endogenous variables according to one proposed in the study's research hypotheses. SEM comprises the measurement and structural models and tests the goodness of the model as a comprehensive model through tests, such as the validity and reliability of each construct. Hence, SEM is the most suitable technique for analyzing the data in this empirical study.

4. Results and Analysis

4.1. Respondents and firm profile

The analysis starts with the respondents' gender, age, and qualification, and the firm's size, ownership structure, and firm age profile. According to the results, 88.3 of % sample comprises males, while the remaining 11.7% are females. Hence, more men were working in manufacturing concerns in Oman. Nearly 30% of the sample is below the age of 25 years, while almost 42% and 23% are in the age groups of 25-25 years and 35-45 years, respectively. Only 18 individuals had an age of more than 45 years. 27.6 % hold a Graduation degree, while 39.6% have a Master's degree.
Moreover, 27% had professional qualifications, and only 20 employees had other educational degrees. The results show that 73 firms had a small size, in which fewer than 50 employees worked, while 104 firms were of moderate size and had up to 200 employees working in them. Forty-seven firms had up to 500 employees, while 34.3% of the sample worked in large firms with up to 1000 employees. 55.4% of sample respondents worked in less mature firms, while the remaining respondents worked in 44.6% of mature firms that had been in the manufacturing business for more than 20 years. 36.1% of the employees worked in firms with public ownership, while the remaining were in private ownership.

Table 1: Profile

Respondents Profile		Frequency	Percent
Gender	Male	301	88.3
	Female	40	11.7
	Total	341	100.0
Age	Less Than 25 Years	102	29.9
	25 to 35 Years	143	41.9
	35 to 45 Years	78	22.9
	More Than 45 Years	18	5.3
	Total	341	100.0
Qualification	Graduation	94	27.6
	Master	135	39.6
	Professional Qualifications	92	27.0
	Other	20	5.9
	Total	341	100.0
Firm Profile		Frequency	Percent
Firm Size	Up to 50	73	21.4
	51 – 200	104	30.5

	201 – 500	47	13.8
	501 – 1000	117	34.3
	Total	341	100.0
	Less Than 20 Years	189	55.4
Fim Age	More than 20 years	152	44.6
	Total	341	100.0
	Public	123	36.1
Ownership	Private	218	63.9
	Total	341	100.0

4.2. Measurement validation and model fitness

The following Table 2 shows the reliability of the scales by the values of Cronbach's alpha and composite reliability, which represent the internal consistency reliability of the scales (Hair, 2009). The table also presents the model fitness using the values of SRMR and NFI.

Table 2: Reliability and Model Fitness

Constructs	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
EC	0.926	0.927	0.944	0.771
EM	0.909	0.911	0.933	0.735
EMC	0.845	0.853	0.896	0.682
EP	0.918	0.927	0.933	0.635
EPA	0.907	0.926	0.931	0.729
ER	0.922	0.924	0.941	0.762
ERO	0.895	0.922	0.934	0.825
ES	0.905	0.908	0.929	0.725
Indicators	SRMR	d_ULS	d_G	NFI
Observed	0.050	2.146	1.128	0.843

In the table, all the values of Cronbach's alpha and Composite reliability for the latent variables are more than 0.7 and close to 1, which is the acceptable range (Hair, 2009). Hence, all scales of latent variables show high reliability. The model fitness is usually determined by the observed values of SRMR and NFI, and according to the table, the structural model seems to be satisfactory in terms of the effect size. NFI for this model is 0.843, which is more than 0.8 and closer to 1, which is the acceptable value. Moreover, SRMR is 0.050, less than the threshold of 0.08. Therefore, these values are sufficient for the model to be considered a good fit in PLS-SEM.

4.3. Discriminant validity

Table 3 determines the discriminant validity through the measures of inter-item correlation of latent variables below the diagonal, and the square root of Average Variance Extracted (AVE) is provided in the diagonal. Discriminant validity is a measure of whether the measures of constructs are theoretically not highly related to each other and not found to be highly correlated (Hubley, 2014).

Table 3: Discriminant Validity

Constructs	EC	EM	EMC	EP	EPA	ER	ERO	ES
EC	0.878							
EM	0.244	0.857						
EMC	0.415	0.168	0.826					
EP	0.352	0.637	0.291	0.797				
EPA	0.442	0.143	0.491	0.256	0.854			
ER	0.373	0.263	0.315	0.367	0.201	0.873		
ERO	0.503	0.293	0.604	0.387	0.741	0.306	0.908	
ES	0.142	0.352	0.114	0.622	0.178	0.304	0.240	0.851

According to the table above, the square root of AVE is higher than the inter-item correlations for all latent variables, which shows that the latent variables have discriminant validity. Therefore discriminant validity of the variables is confirmed.

4.4. Hypothesis testing

Table 4 shows the results of hypothesis testing, determined according to the beta estimates, t- t-statistics, and p-values. Any significance value of more than 0.05 indicates that the results are not statistically significant.

Table 4: Hypothesis Testing

Hypotheses	Hypothetical Path	Estimates	SD	T Statistics	P Values
H1	EnvPro →EP	0.002	0.040	0.053	0.957
H2	EnvPro →EMA	0.482	0.046	10.527	0.000
H3	EMA → EP	0.650	0.042	15.432	0.000
H4	EnvPro → EMA → EP	0.314	0.036	8.647	0.000
Contextual	Firm Age → EP	0.044	0.041	1.074	0.283
Variables	Firm Size → EP	0.119	0.042	2.810	0.005
-	Ownership → EP	0.170	0.040	4.310	0.000

Note: R square = 0.674 and Q square = 0.322.

The values of t- t-statistics are more than 1.96 for H2, H3, H4, and two of the contextual factors. For the same statistics, the significance values are less than 0.05, indicating that these results are significant, and we can accept hypotheses H2, H3, and H4. This shows that Envpro leads to EMA but not EP. The findings also show that EMA contributes directly to EP and indirectly to Envpro and EP. Hence, the mediating effect of EMA in the relationship between them is proven.

Moreover, the results prove that firm size and ownership positively relate to EP, while firm age does not significantly link with EP. Based on this table, we accept H2, H3, and H4, while we reject H1. The rejection of H1 indicates that Envpro has no statistically significant effect on EP.

4.5. Structural model

Figure 2 illustrates the relationships between Environmental Proactivity (EnvPro), Environmental Management Accounting (EMA), and Environmental Performance (EP), alongside contextual factors like firm size, ownership structure, and firm age. The analysis shows that EnvPro has a significant positive effect on EMA (beta = 0.482, $p < 0.001$), confirming that proactive strategies foster stronger EMA practices. Additionally, EMA significantly influences EP (beta = 0.650, $p < 0.001$), indicating that effective EMA practices lead to improved environmental performance. EMA also mediates the relationship between EnvPro and EP (beta = 0.314, $p < 0.001$), highlighting its role in translating proactive strategies into performance improvements. Firm size and ownership structure positively affect EP (firm size: beta = 0.119, $p < 0.01$; ownership: beta = 0.170, $p < 0.001$), while firm age does not significantly impact EP (beta = 0.044, $p = 0.283$), suggesting that firm characteristics, rather than age, are key drivers of environmental success. This emphasizes the importance of EMA as a mediator and contextual factors in shaping EP outcomes.

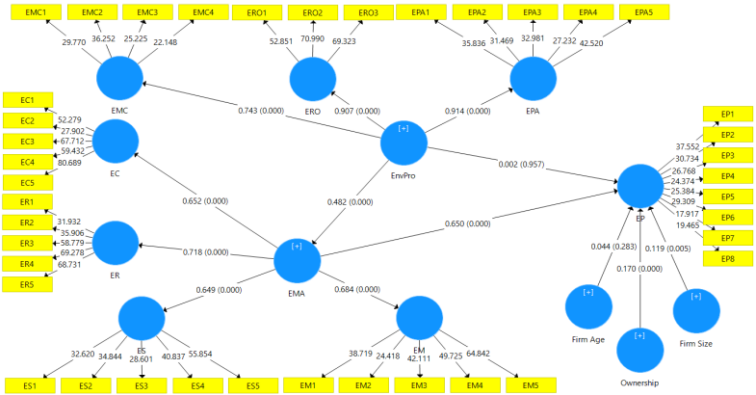

Fig. 2: Structural Model.

5. Discussion and Conclusion

5.1. Discussion

This research investigated the impacts of Envpro both directly and indirectly via EMP. The research findings suggested that the investigation's second, third, and fourth hypotheses should be accepted, whereas the first hypothesis should be dismissed. According to the results, although Envpro did not directly influence the EP of enterprises, it nevertheless had a considerable impact due to the intermediary function that EMA practices had. Verifying the mediation effect is consistent with the findings of earlier investigations (Gunarathne et al., 2021; Latan et al., 2018; Solovida & Latan, 2017). In addition, the business's size and ownership were shown to have a positive and statistically significant impact on the EP. However, the firm's age did not have a statistically significant bearing on the outcome. Studies have also produced similar conclusions (Liu et al., 2019; SAN et al., 2018). The lack of a significant relationship between firm age and Environmental Performance (EP) in this study could be attributed to the unique context of Oman's manufacturing industry, which is still in the process of evolving in terms of environmental practices. While older firms typically benefit from more experience and potentially established processes, in Oman, newer firms may be adopting cutting-edge, environmentally friendly practices that are just as effective as those of their older counterparts. Although this study is focused on Oman, which has a unique socio-economic context, the insights drawn from it may also apply to other developing nations that share similar characteristics, such as emerging manufacturing sectors and evolving environmental policies. For example, countries in Southeast Asia, Africa, and the broader Middle East, which are also in the process of integrating environmental management accounting practices, may find these findings relevant. Future research in these contexts could help further generalize the conclusions of this study. Moreover, the relatively young age of many manufacturing firms in Oman may mean that they are still in the early phases of implementing Environmental Management Accounting (EMA) systems. This study's findings align with previous research conducted in other developing regions, such as Liu et al. (2019) and SAN et al. (2018), where firm age did not consistently correlate with improved environmental outcomes. This indicates that factors like firm size and ownership structure may play a more prominent role in shaping environmental performance in this context.

5.2. Conclusion

This study investigated the effect of Envpro on EP directly and indirectly through EMA practices. The study also assessed the influence of firm size, firm age, and ownership structure on the EP. The findings proved that there is no influence of Envpro on the firm's EP. However, the proactivity contributes to sophisticated management accounting practices, leading EP. The study also concluded that the firm's age had no role in enhancing performance, yet ownership structure and firm size are essential predictors of EP. Since the study shows that contextual factors, i.e., firm age, size, and ownership, influence their EP. Hence, environmental strategies are more successful in organizations with larger sample sizes and not firm maturity. This implies that even if firms are not mature enough, if they scrutinize the business and avail appropriate resources in adopting environmental management practices, they will be able to increase their profits.

5.3. Research implications

The findings of this study provide adequate implications for academicians, who can conduct further research on ways of increasing the EP of the firms. This study has contributed to the legitimacy theory by identifying the underlying mechanisms for this cause. Other contextual

factors can also be identified, proving helpful for the firms aiming to improve their EP. It highlights the potential of environmental management practices to increase the same. The results also accentuate how adopting green strategies can enhance the economic and environmental profits of the firms. When accounting systems, such as EMA, are activated, they serve as a supporting mechanism that aids the managers in planning accurately and making effective decisions. However, well-planned environmental management strategies must be adopted so that the resources are dedicated to environmental gains. Therefore, firms need to invest in such accounting systems that focus on using cleaner and renewable energy sources, training the human capital to make them aware of the greener ways of working, and controlling the performance measures.

In addition to the above, other stakeholders, such as the government, must also be involved in this case to achieve robust congruence for corporate performance. Policymakers can develop policies and legislation for enforcing environmental laws so that firms can be more proactive in such initiatives. The focus remains to encourage companies in all industries to not only enforce but also check on and report the environmental impacts of their business activities. The role of sophisticated EMA practices is highlighted for incorporation in developing countries as they are rapidly developing economically; hence, their development must not be hampered due to legislation. The environmental policies must be made flexibly to promote capacity building for improving corporate sustainability. Examples of these include tax concessions and environmental awards. It is crucial to devise guidelines specifically for sector-specific guidelines and establish benchmarks for the industry.

5.4. Limitations and future directions for research

Despite the study providing vast implications, it suffers from a few limitations, which must be acknowledged, and, using, directions for future studies may be proposed. Firstly, the research gathered the sample data from the Sultanate of Oman, a developing country. The selection of only one country limits the result's generalizability due to a possible disparity in the country's manufacturing firms. Hence, the data can be geographically expanded by selecting more developing countries and testing for the effects in the sample. Secondly, scholars may even compare the Envpro and EP of developing and developed countries in the future. Thirdly, the sample size is relatively small as only the firms from the manufacturing sector are covered in the study. Hence, future studies may include firms from other industrial sectors, such as textiles, services, etc., for assessing the impact of inculcating environmental strategies for higher performance and a cleaner environment. Finally, as cross-sectional data were collected for the sample, this limitation reduces the validity of the results. Hence, this calls for future research to conduct a longitudinal study for better validity of the results. It is recommended that future researchers expand the model by adding and testing more variables and contextual factors as mediators or moderators to analyze their effects.

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