

ACCOUNTING MEASUREMENT OF ENVIRONMENTAL PERFORMANCE COSTS AND ITS IMPACT ON THE QUALITY OF FINANCIAL REPORTS

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Abstract

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This study aimed to investigate the impact of accounting measurement of environmental performance cost elements on the quality of financial reporting information for industrial companies listed on the Amman Stock Exchange (ASE). The study population comprised all 53 companies listed on the ASE at the end of 2022. A questionnaire was used to collect primary data related to measuring the elements of the independent variable (ongoing environmental costs — *OEC*, capital environmental costs — *CEC*, and previous environmental costs — *PEC*) and an applied approach to measure the dependent variable, represented by the quality of financial reporting information. Multiple and simple regression tests were used to assess the relationship between the study variables. The results showed that the accounting measurement of current environmental performance costs had the most significant impact on achieving the quality of financial reporting information, followed by the capital environmental performance costs variable, and lastly, the previous environmental performance costs variable. These findings suggest a positive relationship between the dimensions of accounting measurement of environmental performance costs and the quality of financial reporting information, indicating that as the use of accounting measurement of environmental performance costs increases, the quality of financial reporting information for the studied companies also improves.

Keywords: Environmental Performance Costs, Quality of Financial Reports, Industrial Companies

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1. INTRODUCTION

Companies are now compelled to prioritize environmental protection, conservation, and sustainable development due to a combination of economic, legal, ethical, and social factors in today's business landscape (Al-Mawali et al., 2018). There is a heightened global and local interest in enhancing the environmental performance of companies, as reflected in laws emphasizing the commitment of individuals and organizations to safeguard the business environment against pollution risks. These regulations underscore a company's responsibility to mitigate the adverse external impacts of its activities and contribute to addressing community issues through social responsibility initiatives (Susanto & Meiryani, 2019).

In striving to meet environmental performance standards and contribute positively to their operating environment, companies must make various sacrifices, encompassing both preventive measures (fixed costs) and rectification of environmental damage (operational costs) that were either unavoidable or not adequately addressed (Ali et al., 2019). Embracing these environmental sacrifices inevitably leads to short-term increases in production costs, influencing product prices and, consequently, affecting the company's competitiveness, market share, and overall growth and profitability (Al-Jubouri & Chakroun, 2022). Recognizing the importance of environmental responsibility, the accounting profession must play a crucial role in developing clear and comprehensive accounting rules that govern the measurement, presentation, and disclosure of environmental costs in financial statements. Such rules should transparently convey the company's financial position and the actual results of its operations, incorporating the environmental costs incurred (Khalid, 2023).

Companies are facing mounting pressure to fulfill their social and environmental responsibilities, necessitating the integration of the environmental dimension into accounting practices. This entails accounting for the costs associated with environmental conservation, protection, and remediation of damages resulting from corporate activities. Therefore, there is a critical need to establish conceptual frameworks and accounting guidelines that account for the measurement and disclosure of environmental costs in financial statements and reports (Al-Jubouri & Chakroun, 2022). This study aims to elucidate the impact of accounting measurement for elements of environmental performance costs on the quality of financial reporting information for industrial companies listed on the Amman Stock Exchange (ASE). To achieve this, the study examines three key research questions:

RQ1: Does the accounting measurement of ongoing environmental costs influence the quality of financial reporting information for industrial companies listed on the ASE?

RQ2: Is there an impact of accounting measurement of capital environmental costs on the quality of financial reporting information for industrial companies listed on the ASE?

RQ3: Does the accounting measurement of previous environmental costs affect the quality of financial reporting information for industrial companies listed on the ASE?

The study employs a dual-pronged approach, incorporating both the descriptive-analytical method and the applied method. The descriptive-analytical method involves the development of a questionnaire to collect primary data on independent variables related to environmental performance costs (current, capital, and previous). The applied method assesses the dependent variable (financial reporting information quality) by analyzing the financial statements of industrial companies listed on the ASE.

The structure of this paper is as follows. Section 2 reviews the relevant literature on environmental performance costs, their accounting measurement, and the quality of financial reporting information. Section 3 outlines the research methodology, including the data collection and analysis techniques. Section 4 presents the results of the empirical analysis, while Section 5 discusses the findings in the context of existing literature. Finally, Section 6 concludes the study, highlighting the key contributions and implications.

2. LITERATURE REVIEW AND HYPOTHESES DESIGN

2.1. Environmental corruption

The environment serves as the backdrop for diverse human activities, encompassing all living organisms, including animals and plants. Humans coexist with these entities, forming an interconnected ecological system. Environmental corruption refers to any factor that negatively impacts all components of the environment, affecting plants, animals, and humans. It also encompasses influences on the composition of non-living natural elements such as air, soil, lakes, seas, and others (Jaidi et al., 2018).

The relentless march of technology and modern manufacturing processes has exerted immense pressure on natural resources, particularly non-renewable ones like coal, petroleum, and groundwater (Yang Spencer et al., 2013). Human achievements in industrial progress have introduced novel chemicals previously absent in the environment. Harmful gases emitted from factory chimneys have led to the deposition of toxic chemical waste. This collective impact has manifested in various forms of environmental corruption, including air and water pollution, soil contamination and depletion, unproductive agricultural lands, deforestation, and the escalating extinction of animal and plant species annually (Fuji et al., 2016).

Environmental corruption leaves no facet of the human-surrounding environment untouched. Disturbing noises and harmful radiation have escalated. Water bodies, both seas and rivers, suffer from varying degrees of pollution due to chemical discharges and waste. Air in densely populated regions experiences altered gas ratios, favoring harmful constituents due to internal combustion engines in factories and cars, coupled with diminishing green spaces. Food contamination occurs through pesticides, preservatives, and other detrimental additives. Soil pollution results from pesticide residues, chemical fertilizers, foreign waste, excessive salts, and modern sources contribute to increased noise levels (Fuadah & Arisman, 2013).

While major industrialized nations have been proactive in identifying and addressing environmental challenges, it's noteworthy that they have also been

significant contributors to pollution and environmental imbalances. The juxtaposition of their role in both causing and addressing environmental issues underscores the complex and multifaceted nature of environmental corruption and its implications for organizational environmental performance (Thabit & Ibraheem, 2019).

2.2. The importance of measuring environmental performance costs

In many developing countries, dominant industrial entities typically adhere to traditional manufacturing methods. These companies rely on inputs like energy, raw materials, and labor to conduct their operations, yielding primary outputs in the form of products and waste (Ismail et al., 2014). From an economic standpoint, industries strive to curtail input costs and enhance returns, essentially aiming to maximize profits by minimizing production costs as much as possible (Thabit & Ibraheem, 2019). This prevailing manufacturing approach has prompted numerous industries to neglect investments in waste treatment or other pollution-reduction measures in an effort to cut production costs. Consequently, many industries have resorted to improper disposal of waste in the air, bodies of water, or on land, causing adverse effects on both the environment and human health (Khalid, 2023).

In response to escalating environmental concerns, countries have implemented various laws and procedures, particularly since the latter part of the last century, to restrict factories from disposing of waste into the external environment without proper processing. The focus has been on eliminating pollutants harmful to the environment and human health or reducing their concentrations to environmentally acceptable limits (Verma & Shahwan, 2021). As a result, numerous industries have been compelled to allocate significant resources to waste treatment units or the installation of pollution-reducing devices, leading to a substantial upswing in production costs (Christine et al., 2019). Given that increased production costs translate to diminished returns, many industries have opted to raise product prices, thereby transferring the cost of environmental protection to consumers (Al-Mawali et al., 2018).

This noteworthy shift in the industrial approach to environmental concerns has reshaped the traditional model of industrial activity into a more integrated and environmentally sustainable framework known as the “ecological industrial system” or the “greening of industry”. This system emphasizes optimal energy and material utilization while minimizing waste generation as much as possible (Thabit & Ibraheem, 2019). A meticulous analysis and accurate determination of the elements constituting environmental performance costs, their correct measurement, assignment to the activities causing them, and then associating them with specific products, contribute to a precise evaluation of the cost of these products. Consequently, establishing a proper alignment between product revenues and costs enables more informed pricing decisions and the accurate measurement of the cost of each product at the organizational level. Collectively, these practices contribute to enhancing the organization’s profits and market share in the long run (Ismail et al., 2014).

2.3. Accounting measurement of environmental performance costs

Environmental accounting measurement involves determining the values of cost elements associated with a company’s commitment to specific social and environmental responsibilities, whether voluntary or legally mandated (Alshehadeh, 2010). Conventional accounting practices assume organizations are not inherently environmentally or socially responsible, even in the case of state-owned entities (Christine et al., 2019). Recognizing this limitation, there is a growing need for research to explore the role accounting can play in offering insights into the environmental impacts of companies. This call is grounded in several justifications (Verma & Shahwan, 2021):

- *Incorporating environmental and social costs:* There is a shift towards considering the cost of environmental conservation and protection within production costs, necessitating the integration of environmental and social costs into accounting practices.

- *Society’s delegation of environmental responsibilities:* Society delegates environmental protection responsibilities to account, compelling it to develop methods that provide information crucial for decision-making regarding resource utilization and its subsequent evaluation and monitoring.

From the company’s perspective, environmental costs encompass all explicit and implicit sacrifices made to prevent or mitigate environmental damage resulting from various activities. These costs also include rectifying errors and damages arising from actions that have negatively impacted the environment (Huynh & Nguyen, 2024). In contrast, environmental performance encompasses all activities, whether mandatory or voluntary, undertaken by an organization to prevent or mitigate environmental and social damage resulting from its production or service activities (Firmansyah & Estutik, 2020).

Despite the importance of accounting measurement in evaluating environmental operations, it has not received as much attention as the tangible measurement of these operations. This is primarily due to the lack of cost and market prices that could facilitate the financial accounting assessment of such operations (Alshehadeh, 2010). According to Dhaif Allah et al. (2021) and Oudat et al. (2020), the environmental damages affecting the organization’s operating environment raise several questions related to the specific challenges in accounting measurement of environmental performance costs, including:

- *Establishing causal relationships:* Determining the causal relationship between violating behavior and the resulting environmental damage poses a significant challenge.

- *Identifying the polluting party:* Definitively identifying the party responsible for pollution is often complex and challenging.

- *Specifying damages:* Pinpointing the precise damages incurred by the environment poses difficulties, given the complexity and interconnectedness of environmental systems.

- *Diversity in forms of environmental corruption:* The multifaceted nature of environmental corruption introduces challenges in accounting for its diverse forms and manifestations.

According to Alshehadeh (2010), neglecting the meticulous examination, enumeration, and precise measurement of environmental performance costs by accountants or employing inaccurate accounting measures for these costs can have far-reaching consequences:

1. *Diminished environmental performance quality*: Failure to rigorously assess and measure environmental performance costs may result in subpar environmental performance quality. This, in turn, can lead to legal repercussions and adverse social consequences, such as fines and the withdrawal of state-sponsored investment incentives for facilities dedicated to maintaining high environmental performance standards.

2. *Informed decision-making impairment*: The repercussions extend to decision-making processes concerning product pricing and the selection of production and disposal methods for production waste. Without accurate accounting of environmental performance costs, decision-makers may inadvertently make uninformed choices, potentially exacerbating environmental impact.

The impact of projects on the environment can influence both natural ecosystems and social and cultural conditions. Recognizing the imperative of environmental conservation, many economic establishments are now pursuing social goals alongside economic objectives to contribute to environmental preservation and societal well-being (Christine et al., 2019). While minimizing costs is essential for profit maximization, this should not disregard additional costs borne by society, such as the often-unseen environmental performance costs. These costs reflect the value of resources damaged or impaired by companies, shifting the burden onto others and encompassing issues like water and air pollution and harm to residential and industrial agricultural areas (Huynh & Nguyen, 2024).

The enumeration and measurement of environmental performance costs become meaningful only when they contribute to better decision-making (Elmassri et al., 2022). Addressing the multifaceted purposes of measuring and analyzing costs and environmental performance, the accounting measurement process needs to focus on categorizing and enumerating environmental costs comprehensively (Ismail et al., 2014). Various classification patterns contribute to this process, aiding in identifying the role of environmental costs in accounting measurements. Environmental performance costs, linked to environmental activities, are broadly categorized into two main groups (Gaviria et al., 2023):

1. *Environmental performance control costs*: These encompass activities dedicated to monitoring environmental performance and preventing environmental damage. Spanning from pre-production stages to the product reaching the consumer, these costs are seen as value-adding by reducing other environmental performance costs, thus bolstering company profits and competitiveness.

2. *Costs of failure in environmental performance control*: These arise from activities that fail to prevent environmental damage and are deemed unnecessary costs that do not contribute value. Minimizing or preventing these costs can lead to an overall reduction in environmental performance costs and increased company profits.

The costs of environmental performance fall into three categories based on the mentioned groups (Le et al., 2019):

a) *Ongoing environmental costs (OEC)*: These include expenses directly or indirectly linked to benefits realized during the accounting cycle, such as treating production waste, immediate damage removal, pollution prevention, training costs, and environmental management and auditing activities.

b) *Capital environmental costs (CEC)*: Following generally accepted accounting principles, these costs are recorded if they are expected to yield future economic benefits and are recoverable. Examples include installing filters and equipment, establishing water treatment stations, and designing products for targeted environmental performance quality.

c) *Previous environmental costs (PEC)*: These costs, incurred in previous periods, involve adhering to environmental laws for pollution disposal and addressing production waste from earlier cycles.

2.4. Financial reporting quality

The quality of financial reporting is crucial for various stakeholders, such as management, investors, and regulatory bodies. However, the accounting field has not yet established a clear and comprehensive definition of financial reporting quality. Despite its importance, there is no widely accepted, specific conceptualization of this concept within the accounting discipline (El Qirem et al., 2023). Addressing this gap, a previous study has characterized accounting information quality as the credibility of the information contained in financial reports and its utility for users (Alshehadeh et al., 2023). This involves ensuring that the information is free from distortion and misrepresentation, and adhering to legal, regulatory, professional, and technical standards to fulfill its intended purpose. Another study has also conceptualized financial reporting quality as encompassing the characteristics of the financial information within these reports (Al Omari et al., 2017).

While there is no consensus among authorities on specific characteristics, the essence of these traits stems from the practical utility of accounting information in decision-making. The effectiveness of accounting information hinges on the confidence it instills, the relevance of the information, and its comparability. These three factors collectively enhance the usefulness of accounting information in decision-making processes (Velte, 2022). The characteristics of accounting information establish a foundational framework for the quality of financial reports. From this framework, an appropriate approach emerges to define the concept of quality, emphasizing the utility of financial information for decision-making and the governance aspect, which facilitates stakeholder monitoring of management performance (Elmassri et al., 2022).

Accounting information serves as the conduit through which companies communicate their financial and non-financial status and performance. It is the technical medium employed to present accounting information in financial reports, requiring suitability and meticulous preparation to ensure complete credibility for reliance and informed decision-making (El Qirem et al., 2023). The quality of financial information and reports has drawn significant

attention from various stakeholders due to its profound impact on investment decisions. Parties relying on these reports for economic decisions have persistently expressed concerns about the quality, transparency, and accuracy of disclosed information in financial reports, aiming to reflect the true state of the company (Eyenubo et al., 2017).

Attaining financial reporting quality is intricately tied to the quality of each element within the accounting system. The integrated concept of quality considers the various dimensions associated with each element of the accounting system, as highlighted by several studies (Alshehadeh & Al-Khawaja, 2022; Gelmini & Vola, 2021; Younis, 2020):

1) *Design quality*: Design quality encompasses factors influencing inputs and operational processes within the accounting system. It revolves around the application of standardized and appropriate accounting methods tailored to the activities of the accounting unit. This entails crucial modifications to the structure of accounting recognition and measurement to accommodate events, circumstances, and operations unfolding in both internal and external accounting environments.

2) *Compliance quality*: Compliance quality focuses on the operational aspects of accounting events, emphasizing the accurate and suitable selection of policies, procedures, and accounting rules. These elements govern the manipulation and transformation of accounting data and information to align with the needs of end-users.

3) *Performance quality*: Performance quality emerges as a composite outcome of both design and compliance quality, centering on the satisfaction of users interacting with the accounting system's outputs. This level of quality should prompt a transition in the nature of the information sought, shifting from historical data to future-oriented and predictive information. This shift entails a move from detailed to summarized information relevant to decision-making, with varying information levels tailored to managerial positions within the accounting unit environment. Additionally, it encompasses diversification in disclosure and presentation elements to cater to the nuanced needs of stakeholders.

2.5. Quality metrics for financial statements

Researchers widely agree that the foundational aspect of financial reports hinges on the quality of profit. Essentially, most scholars employ a metric related to profit quality to evaluate the overall quality of financial reports. In a previous study, it was posited that profit quality constitutes a distinct concept within the broader framework of financial reporting quality (Tanputra et al., 2023). Assessing financial reporting quality through the lens of profit quality is deemed appropriate as profit represents the net cash flow derived from a company's utilization of available resources. Consequently, profit is contingent upon factors such as the quantity of resources at the company's disposal, prevailing economic opportunities, and anticipated economic conditions. The interplay between profit, cash flow, and fluctuations in the market value of equity holds significance as indicators of profit quality and, by extension, financial reporting quality (Eyenubo et al., 2017).

The actions of corporations can incur environmental costs and damages, potentially influencing the informational characteristics present in financial statements adhering to generally accepted accounting principles. If environmental costs are objectively quantified, these effects and their outcomes ought to be manifested in the quality of financial reports issued by these companies. This is pertinent for both current and prospective stakeholders within corporate economies (Mbawuni, 2019).

Diverse metrics have been employed in prior studies to gauge financial reporting quality. Noteworthy examples include studies (Hu et al., 2014; Karami & Hajiazimi, 2013; Firmansyah & Estutik, 2020), which adopted accounting conservatism as a metric for financial reporting quality. Their findings suggest that accounting conservatism restricts management's ability to conceal unfavorable information and embellish the financial performance of the company, ultimately reducing information asymmetry. It was observed a correlation between accounting conservatism and the quality of earnings in terms of continuity, predictability, relevance, and timeliness (Firmansyah & Estutik, 2020). On a different note, other studies measured financial reporting quality by scrutinizing earnings management practices (Gelmini & Vola, 2021; Goel, 2012). These studies indicated a negative relationship between earnings management and both earnings quality and financial reporting quality. The adverse effects of earnings management on the informational value available to financial statement users stem from diminished earnings quality and the misrepresentation of actual company performance. Another avenue explored by researchers involves using the income smoothing measure to assess financial reporting quality, with income smoothing regarded as one of the methods of earnings management. A model formulated previously is often preferred in this context (Francis et al., 2004). It utilizes the ratio of cash flow volatility to profit volatility to gauge income smoothing, thereby illustrating the extent to which accrual accounting contributes to mitigating fundamental fluctuations in the economic unit's operations.

2.6. Research hypotheses

In this study, we test the following hypotheses:

H1: There is no statistically significant impact, at the conventional significance level of $\alpha \leq 0.05$, arising from the accounting measurement of environmental performance costs within industrial companies listed on the ASE.

H1a: There is no statistically significant impact, at a level of $\alpha \leq 0.05$, for the accounting measurement of ongoing environmental performance costs in industrial companies on the ASE on the quality of their financial reporting information.

H1b: There is no statistically significant impact, at a level of $\alpha \leq 0.05$, for the accounting measurement of capital environmental performance costs in industrial companies on the ASE on the quality of their financial reporting information.

H1c: There is no statistically significant impact, at a level of $\alpha \leq 0.05$, for the accounting measurement of previous environmental performance costs in industrial companies on the ASE on the quality of their financial reporting information.

3. RESEARCH METHODOLOGY

3.1. Method

In order to ensure the robustness of the obtained results, our study encompasses all 53 industrial companies listed on the ASE, collectively constituting the study population. It is essential to note that the selected sample is reflective of the entire population under consideration. The focal point of our investigation rests on the independent variable, which encapsulates the facets of environmental performance costs. These encompass ongoing environmental costs, capital environmental costs, and previous environmental costs. Correspondingly, the dependent variable in our study is the *financial reporting quality* of industrial companies enlisted on the ASE.

Our research employs a dual-pronged approach, incorporating the descriptive-analytical method. We devised a questionnaire to collect primary data, specifically tailored to gauge the elements constituting the independent variable. This questionnaire comprises two sections: the first section gathers general information about the respondents, while the second section delves into 21 items pertinent to the elements of environmental performance costs (ongoing environmental costs — *OEC*, capital environmental costs — *CEC*, and previous environmental costs — *PEC*).

For the assessment of the dependent variable, we adopt a pragmatic methodology by scrutinizing the financial statements of industrial companies listed on the ASE in 2022. The measurement of the dependent variable revolves around evaluating the income smoothing index (*SI*) as a pivotal indicator of *financial reporting quality*. To quantify income smoothing practices, we lean towards the model formulated by Francis et al. (2004), a preferred choice among many researchers in the field. The calculation of income smoothing adheres to the following equation:

$$SI_{it} = \sigma_i(CFO_{it}/Total\ assets_{it}) \quad (1)$$

where,

- SI_{it} — income smoothing degree for the company j for the period t ;
- σ_i — standard deviation;
- CFO_{it} — net operating cash flows for the company j for the period t ;
- $Total\ assets_{it}$ — total assets of the company j for the previous year for the period t .

Higher values of the *SI* signify a lower degree of income smoothing. This implies that management refrains from manipulating accounting income values, further emphasizing the presence of qualitative characteristics such as relevance, reliability, and comparability. Consequently, this underscores the overall quality of financial reports.

In pursuit of our study's objectives, the subsequent procedures were undertaken subsequent to the acquisition of reports and financial statements from industrial companies, constituting our study population.

- *Step one:* The initial step involved categorizing companies into two groups: those practicing income smoothing and those abstaining from such practices. This classification was executed based on

the model proposed by Francis et al. (2004). Notably, 36 companies from the selected population were identified as engaging in income-smoothing practices.

- *Step two:* Each company, irrespective of its income smoothing status, was assigned a gradual code. Companies practicing income smoothing received a code of 1, while those abstaining from such practices were assigned a code of 0.

The subsequent phase involved utilizing the Statistical Package for the Social Sciences (SPSS) for comprehensive data analysis. This encompassed hypotheses testing through multiple regression and linear regression.

The formulation of an aggregate model for multiple regression testing is as follows:

$$SI_{it} = \beta_0 + \beta_1 OEC_{it} + \beta_2 CEC_{it} + \beta_3 PEC_{it} + \varepsilon_{it} \quad (2)$$

where, ε_{it} — random error, β — regression coefficients, β_0 — constant part of the regression equation.

This analytical framework allowed us to delve into the intricate relationships between income smoothing, as identified through the *SI*, and various factors contributing to the *financial reporting quality* of the selected industrial companies.

3.2. Alternative methods and justification

While our study employs a questionnaire to assess the independent variables (components of environmental performance costs) and utilizes data from the ASE to measure the dependent variable (*financial reporting quality*), alternative methods could have been considered. One such approach is conducting a longitudinal study, where data is collected over multiple years to examine the relationship between environmental performance costs and *financial reporting quality*. This method would allow for the analysis of trends and changes over time, potentially providing insights into the long-term impact of environmental performance costs on *financial reporting quality*. However, our chosen methodology, which focuses on a single year 2022, offers several advantages. Firstly, by collecting data for all variables within the same time period, we ensure consistency and comparability across the dataset. This eliminates potential confounding factors that may arise from using data spanning different years, such as changes in accounting standards, economic conditions, or company-specific events. Secondly, our approach aligns with the objective of capturing a snapshot of the current state of the relationship between environmental performance costs and *financial reporting quality* in the Jordanian context. By focusing on a single year, we can provide a comprehensive and up-to-date analysis of this relationship, which is particularly relevant given the increasing importance of environmental considerations in the business world. Moreover, our methodology combines primary data collection through a questionnaire with secondary data obtained from the ASE. This dual-pronged approach allows us to gather specific information on environmental performance costs directly from the companies, while also leveraging the reliability and objectivity of financial data reported to the ASE. The questionnaire enables us to capture nuanced aspects of environmental performance costs that may not be readily available in public financial statements, enhancing the richness of our dataset.

4. RESEARCH RESULTS

Our initial assertion (*H1*) posits that there is no statistically significant effect, at the conventional significance level of $\alpha \leq 0.05$, arising from the accounting measurement of environmental performance costs within industrial companies listed on the ASE. This effect, if present, would influence the quality of information found in their financial reports.

To scrutinize the validity of *H1*, we conducted a rigorous multiple-regression analysis. The objective was to discern the impact of accounting measurements related to environmental performance costs on the quality of information embedded in the financial reports of industrial entities listed on the ASE.

The comprehensive findings derived from this analysis are succinctly encapsulated in Table 1 providing a clear and organized presentation of the results. This table serves as a valuable reference point for understanding the nuanced relationship between the accounting measurement of environmental performance costs and the quality of information elucidated within the financial reports of companies within the ASE.

Table 1. Results of a multiple regression analysis test of the effect of environmental performance costs on the financial reporting quality

Panel A: Model summary			
Dependent variable		Correlation R	Coefficient of determination R²
SI		0.317	0.274
Panel B: Analysis of variance (ANOVA)			
DF		F-value	p-value
Regression	11	7.957	0.012
Residue	254		
Total	265		
Panel C: Coefficients			
β regression coefficient	T-value		p-value
OEC	0.472	2.572	0.001
CEC	0.254	1.078	0.003
PEC	0.137	1.153	0.000

Table 2. Summary of linear regression analysis for independent variables on the dependent variable

Dependent variable	Independent variables	Correlation R	Coefficient of determination R² (explained variance)	Adjusted R²	Standard error	F-value	p-value
SI	OEC	0.328	0.284	0.079	18091961.37	16.357	0.000
	CEC	0.239	0.172	0.037	17542464.15	8.316	0.001
	PEC	0.182	0.158	0.033	11517364.17	5.971	0.002

Table 2 provides illuminating insights into the impact of various dimensions of accounting measurement for environmental performance costs on the *financial reporting quality* information within industrial companies listed on the ASE.

OEC: This dimension emerges as the most influential, boasting a correlation coefficient of 0.328. Essentially, this indicates a robust positive relationship between the accounting measurement of *OEC* and *financial reporting quality*. The coefficient of determination (R^2) for this dimension stands at 0.284, elucidating that 28.4% of the variance in *financial reporting quality* can be attributed to the accounting measurement of *OEC*.

CEC: Following closely, the accounting measurement variable for *CEC* wields a notable impact, as evidenced by its correlation coefficient of 0.239. This signifies a positive association with the achievement of high-quality financial reporting

information. The corresponding (R^2) value for this dimension is 0.239, indicating that 23.9% of the variance in *financial reporting quality* is explicable through the accounting measurement of capital environmental performance costs.

PEC: The variable measuring previous environmental performance costs, while exerting a somewhat lesser influence, still holds significance with a correlation coefficient value of 0.182. This implies a positive relationship with the attainment of *financial reporting quality*. The R^2 value for this dimension is 0.158, elucidating that 15.8% of the variability in *financial reporting quality* is attributable to the accounting measurement of previous environmental performance costs.

Importantly, all dimensions of the accounting measurement for environmental performance costs exhibit statistical significance at a level of $\alpha \leq 0.05$. This underscores the affirmative link between these

Examining the impact coefficients (β), we find notable values: 0.472 for ongoing environmental costs (*OEC*), 0.254 for capital environmental costs (*CEC*), and 0.137 for previous environmental costs (*PEC*). All these coefficients are positively significant, with a significant level exceeding 0.05. This implies that an intensified focus on measuring environmental performance costs by industrial companies listed on the ASE is correlated with a reduction in income smoothing processes and, consequently, a decline in the quality of financial reporting information for these companies.

Supporting this inference is the significance of the calculated F-value presented in Table 1. This confirms the acceptance of the alternative hypothesis, asserting a statistically significant impact, at a level of $\alpha \leq 0.05$, for the accounting measurement of environmental performance costs on the quality of financial reporting information within industrial companies on the ASE. To further dissect the dynamics, we tested three sub-hypotheses.

In scrutinizing the sub-hypotheses *H1a-H1c*, the correlation coefficient between the characteristics of the accounting measurement of environmental performance costs and the quality of financial reporting information for industrial companies on the ASE was computed, as delineated in Table 2.

dimensions and the quality of financial reporting information. Moreover, the findings suggest that an augmented application of the accounting measurement for environmental performance costs correlates with an enhancement in the quality of financial reporting information among the studied companies.

The F-values associated with each dimension further fortify our conclusions. For the accounting measurement of *OEC*, an F-value of 16.357 supports the acceptance of *H1a*. Likewise, the F-value of 8.316 for the accounting measurement of *CEC* aligns with the acceptance of *H1b*. Lastly, the F-value of 5.971 for the accounting measurement of *PEC* confirms the acceptance of *H1c*. All these values affirm the statistically significant impact of these dimensions on the quality of financial reporting information within industrial companies listed on the ASE.

5. DISCUSSION OF THE RESULTS

In light of the growing local and international community's interest in issuing laws and regulations aimed at protecting the environment from the damages caused by pollution, and the increasing pressure on Jordanian companies, particularly industrial ones, to preserve the environment by eliminating or preventing the harm caused by their economic activities and the impact on the environment and the ecological surroundings in which they operate, this study delves into the intricate relationship between the accounting measurement of environmental performance cost elements and the quality of financial reporting information within industrial companies listed on the ASE. The pressing need to incorporate environmental considerations into accounting practices, covering costs associated with conservation, protection, prevention, and remediation of environmental damages caused by corporate activities, underscores the significance of our investigation.

Environmental accounting, evolving to address these demands, introduces concepts that were previously overlooked. It emphasizes the measurement and disclosure of environmental costs in financial statements and reports, aiming to identify and quantify environmental activities. This approach not only facilitates informed decision-making in environmental management but also provides stakeholders with comprehensive information encompassing both financial and environmental performance data.

The findings of the current study emphasize the necessity of earnestly striving to incorporate the environmental dimension into the field of accounting measurements with greater attention than is currently the case and to disclose them by taking into account the costs of preserving and protecting the environment or preventing and eliminating the damages caused by the activities of the industrial companies under study. The current accounting measurement tools need to be developed to consider accounting for indirect environmental costs, as identifying and measuring environmental activities have become essential for improving the credibility of the information disclosed in the financial reports of these companies.

Our study, contextualized within the broader literature, adds a nuanced layer to the ongoing

debate on the relationship between the accounting measurement of environmental performance costs and the quality of financial reports. A comprehensive review of previous research reveals a spectrum of results, with studies suggesting varying impacts of accounting measurement for environmental performance cost elements on accounting information and financial performance. Specifically, our findings contribute statistical evidence supporting a robust positive impact of accounting measurement for environmental performance cost elements on the quality of financial reporting information within industrial companies listed on the ASE. This contrasts with divergent outcomes in prior studies, emphasizing the importance of considering contextual factors and industry-specific dynamics. In our exploration of the literature, we note distinct findings from prior research. For instance, a previous study highlighted a strong relationship between economic performance, measured by profitability, and the social and environmental performance of companies (Alshehadeh, 2010). The study emphasized the positive correlation between companies successfully reducing pollution rates and achieving higher cash flows. Similarly, Gaviria et al. (2023) identified an inverse relationship between company size and its tendency towards environmental accounting disclosure, suggesting that the type of company activity directly influences its environmental disclosure process. Susanto and Meiryani (2019) and Elrefae et al. (2024) underscored the importance of accurately restricting, measuring, and analyzing environmental performance costs for improving both environmental and economic performance. Our study uniquely focuses on the ASE-listed industrial companies, revealing a strong positive impact of accounting measurement for environmental performance cost elements on financial reporting quality. While the literature showcases diverse perspectives, our findings contribute to the broader understanding of these dynamics, emphasizing the need for industry-specific analyses.

Undoubtedly, the results of this study are important for many parties, primarily the management of these companies. The accounting measurement of environmental performance contributes to producing important data and information for use in making decisions related to the company's activities and its stakeholders. Without an objective accounting measurement of the company's environmental activities, the various effects of the companies' activities related to environmental performance will not be known, thereby impacting the measures taken to protect the environment from harmful negative effects. Conversely, the presence of accounting measurement for environmental performance will assist in comparing companies and thus work to improve resource allocation among them. Ultimately, the existence of environmental performance disclosures will enable companies to conduct environmental feasibility studies to determine whether they achieve a valuable social return for the community. Furthermore, the results of this study also confirm that obligating industrial companies in the Jordanian environment that cause environmental damage to adopt an environmental accounting system that takes into account the accounting measurement of all environmental

costs referred to in the study and works to adhere to the mechanisms and procedures agreed upon by accounting professionals in this regard will facilitate the task of measuring environmental costs due to their specificity and the difficulty of accurately determining them. On the other hand, professional accounting organizations, whether international or national, must play their role by issuing special accounting standards that require companies to measure environmental performance costs and disclose them in financial statements. There is also a need for coordination between accounting and environmental bodies, representatives of industrial companies, and universities, and to activate the role of the latter in training accountants on the applications and skills of environmental accounting. Additionally, granting tax incentives and facilitating the granting of bank loans to companies that comply with environmental laws and regulations and adopt a clean production program should be considered to encourage them to undertake accounting measurements of environmental performance processes and improve the quality of data and information disclosed in the reports and financial statements of these companies.

6. CONCLUSION

This study provides valuable insights into the intricate relationship between the accounting measurement of environmental performance costs and the quality of financial reporting information within industrial companies listed on the ASE. The findings underscore the necessity for cohesive integration between organizational structures and sound accounting principles in the examination and categorization of environmental performance cost elements. Additionally, they stress the importance of disclosing companies' roles in environmental conservation and their efforts to mitigate the adverse environmental impacts of their activities. This implies a critical need for businesses to align their operational strategies with sustainable practices, emphasizing transparency and responsibility in their financial reporting. The study's contribution to the existing literature is twofold. First, it adds statistical evidence supporting a robust positive

impact of accounting measurement for environmental performance cost elements on the financial reporting information quality of industrial companies listed on the ASE. This contrasts with the divergent outcomes reported in prior studies, highlighting the importance of industry-specific and contextual factors in shaping these dynamics. Second, the study provides a comprehensive framework for understanding the various dimensions of environmental performance costs and their influence on the quality of financial reporting information, which can inform future research endeavors.

Despite the study's significant contributions, it is not without limitations. The cross-sectional nature of the financial statement analysis, while providing a snapshot of the current situation, may not capture the dynamic changes in the relationship over time. Future research could address this by employing longitudinal or panel data approaches to examine the long-term implications of accounting for environmental performance costs on financial reporting quality. Additionally, the study's focus on the ASE-listed industrial companies may limit the generalizability of the findings to other industries or geographical contexts. Expanding the research to include diverse sectors or conducting comparative analyses across different countries could yield valuable insights into the contextual factors shaping the interplay between environmental accounting and financial reporting quality. As the global emphasis on environmental responsibility continues to grow, the integration of environmental considerations into accounting practices will be crucial for corporations to demonstrate their commitment to sustainability and transparency. The findings of this study underscore the pressing need for accounting professionals and regulatory bodies to develop comprehensive frameworks and guidelines that facilitate the accurate measurement, presentation, and disclosure of environmental performance costs within financial statements. This, in turn, will enhance the informational value of financial reports, enabling informed decision-making by various stakeholders and promoting sustainable business practices.

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