

Using Environmental Accounting Approach in Assessing Environmental Cost Accounting Impact on Financial Performance

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Abstract—Environmental cost accounting is an arising perception, prompting this investigation into its theoretical framework and its effect on the financial performance of oil industries in the area. Utilizing secondary data spanning from 2020 to 2024, sourced from the annual reports of selected oil industries operating in the Kurdistan Region, this study employs STATA version 12 for regression analysis. Results suggest that environmental cost variables significantly influence the financial performance of these oil industries, as determined by return of asset. This study advocates for the consideration of environmental performance alongside other metrics in evaluating company performance, emphasizing the need for legislation mandating adherence to international environmental protection standards.

Keywords—Environmental Cost Accounting, Oil Companies, Kurdistan Region.

I. INTRODUCTION

Environmental accounting is a field that focuses on gathering and analyzing information on the environmental aspects of a business. It involves tracking and reporting the materials and costs involved with these characteristics. Environmental accounting is closely linked to environmental information and eco-auditing systems. Environmental accounting is a nascent and evolving discipline (Rahman & Islam, 2023). However, in Iraq, the practice of environmental accounting is still in its early stages. The implementation of environmental accounting in organizations, particularly Oil companies, is met with resistance or neglect due to reasons such as a lack of awareness and inadequate education on green and ethical practices. Environmental accounting focuses on accounting and management matters about environmental and social implications, regulations and limitations, safety, environmentally sustainable practices, and economically feasible energy production and supply (Wiredu et al., 2023; Birdawod, 2022). The primary objective of green accounting is to address social and environmental issues, which can have a significant impact on achieving sustainable development and a

healthier environment in any country. It also influences a company's actions when it comes to addressing social and environmental responsibility concerns (Massoudi & Birdawod, 2023).

Environmental cost accounting (ECA) possesses multiple definitions and fulfills diverse objectives, including the preservation of national wealth and the enhancement of financial performance inside industries. This study examines how the implementation of environmental accounting might enhance internal company choices and influence financial performance. Proponents of environmental cost accounting assert that environmentally responsible business decisions can enhance corporate profitability, promote environmental stewardship, and yield significant health advantages for humans. Therefore, for ECA to be a sustainable business practice, it must yield improvements, as companies should not persist with strategies that result in negative cash flow (Massoudi et al., 2019; Al-Delawi & Ramo, 2020). Hence, financial benefits are essential for the viability of environmental cost accounting. This paper aims to assess the impact of environmental expenditures on the performance of oil companies in the Kurdistan Region, providing a foundation for decision-making in investment and contributing to the knowledge in the field of ECA in annual reports, particularly from the perspective of developing countries. It is crucial for firms in the Kurdistan Region to align with the prevailing trend of cost accounting for expenses at the environmental corporate level (Sulaiman, 2023). However, in challenging business environments where favourable economic returns may not be immediate, the question arises whether these businesses can sustain environmental cost accounting practices. It is imperative to consider whether employing environmental accounting methods would contribute to business success. Previous studies on ECA disclosure and its impact on industries' performance in the Iraqi Kurdistan Region have been primarily exploratory and descriptive, lacking empirical analysis. Therefore, this research seeks to empirically determine whether the environmental expenses incurred by Kurdistan Region oil

corporations affect their financial performance. The study examines the performance of listed Kurdistan Region oil industries in relation to environmental expenses, hypothesizing that such expenses have minimal to no impact on the financial efficiency of these corporations. The following hypotheses proposed as a result of the literature study is as follows:

H0: ECA have not a significant influence on the FP of oil industries in the Kurdistan Region.

H1: ECA have a significant influence on the FP of oil industries in the Kurdistan Region.

II. LITERATURE REVIEW

A. Environmental cost accounting concept

Environmental cost accounting is a strategic accounting method that detects, calculates, and assesses environmental impacts together with their associated financial implications. This encompasses expenses connected to environmental compliance, resource conservation, pollution mitigation, and other sustainability initiatives. It seeks to integrate environmental decision-making with financial decision-making to provide a comprehensive perspective on how environmental initiatives impact the overall financial performance of a business. This enables firms to align their financial objectives with their environmental effect, fostering sustainable and responsible practices.

B. Theoretical Framework

1) Environmental Cost Accounting (ECA)

The US Environmental Protection Agency (EPA) described environmental cost accounting as identifying and evaluating the costs associated with environmental materials in 1995, and helping management to make informed decisions related to the environment through this information. ECA functions as a system for tracking and reporting all environmental costs companies incur. It also gives industry a chance to demonstrate its public environmental stewardship. This accounting method seeks to determine the negative environmental impacts of a company's operations and systems. According to the EPA (1995), environmental costs encompass fines for environmental pollution, which have direct financial implications for an industry's performance as well as impacts on individuals, society, and the environment. The definition of ECA and its dimensions served as the basis for the key term used in this paper.

2) Financial Performance

Financial performance refers to the assessment of a company's activities and policies, typically over a specific period, to evaluate its overall financial health. This evaluation allows for comparisons with similar businesses within the same group of industries (Massoudi, 2018; Zaidan et al, 2024). Measures such as ROI, ROA, and ROS are commonly used indicators of financial performance, reflecting how effectively a company utilizes its considered key assets to make revenue. Internal audits conducted following the rules of the Institute of Internal Auditors impact the financial performance of banks in

the Kurdistan Region (Fatah et al., 2021). Fluctuations in crude oil prices, as highlighted by prior research by the IMF, can influence monetary policies, financial markets, corporate profitability, economic activity, and inflation. Asset prices in the stock market reflect both current and anticipated information about a company's financial health, with the present discounted value of future net profits being used to determine asset valuations. While crude oil price fluctuations play a significant role in economic activity, other factors beyond these fluctuations also impact performance. Conversely, Lameira et al. (2012) found that the oil sector exhibited the highest profitability in the European countries from 2005 to 2009, supporting the conclusions of Ramos & Veiga (2013). It has been noted that it is inappropriate to assume significant performance variations among energy firms based solely on their location, although their research did not include crude oil prices as a variable. Instead, they contrasted different sectors within the energy industry.

C. Related Studies

Various studies, both within and outside developing countries, including those conducted by Ghali & Habeeb (2018), have found differing levels of evidence maintaining a relationship between environmental spending and industry performance. Accounting researchers have emphasized the importance of environmental expenditure accounting and disclosures for both internal and external stakeholders. However, research on the reliability of environmental disclosures in financial statements has yielded mixed results (Pandey & Kumar, 2016; Erhinyoja & Marcella, 2019).

Owolabi (2006) investigated the inclusion of environmental expenses in oil and gas accounting in the Kurdistan Region, finding a high level of stakeholder awareness and positive attitudes toward environmental cost and responsibility. Osemene (2007) examined accounting, financial, and environmental challenges related to oil and gas operations in Iraq, highlighting significant obstacles in financial and environmental accounting, including issues with underreporting charges and allocating expenses to environmental elements.

Theoretical frameworks concerning environmental disclosure are typically based on decision-usefulness research (Hamilton, 2005; Meyer et al., 305), which are often challenged by Positive Accounting Theory (PAT) and/or stakeholder and legitimacy theories related to the management of environmental disclosure. Stakeholder theory elucidates how an organization reconciles the demands of many stakeholders, whereas institutional theory delineates how an organization strives to adhere to societal ideals through compliance with established laws and conventions. Therefore, the frameworks seek that are the agents of the target system situated within the concentrated context of resource dependence theory.

This study serves as an eyeglass to this gap and investigates the relationship between ECA and FP in the oil companies of the Kurdistan Region. Many scholars (Al-Mawali, 2021; Qader et al, 2025) have also supported the dominance of legitimacy theory as an explanation for the increase in ECA since the early

1980s. Stakeholder theory, institutional theory, and resource dependence theory are other theoretical families so has been used relating to social and environmental accounting research.

III. METHODOLOGY

The model of the study uses a linear regression equation as a research method. The population of the research includes oil industries working in Iraq, and because it covers massive data, hence the study selected three industries as a sample, which are: Lalas, Dana Gas, and Kar company.

A. Environmental cost accounting concept

The model of the study uses a linear regression equation to evaluate the proposed hypothesis. The model has only one dependent variable, characterised by ROA, and two independent variables: Cost of Environmental Remediation and Pollution Control (ERPC), and Donations and Charitable Contributions (DCC).

$$ROA = \beta_0 + \beta_1 Y_1 + \beta_2 Y_2 + e$$

Where:

ROA = Return on Asset

β_0 = Intercept

β_1 , and β_2 = Coefficient of the independent variables

Y_1 = ERPC

Y_2 = DCC (Measured by Total Donations and Charitable Contributions)

e = Residual or error term

IV. RESULTS AND DISCUSSION

A. Basic Sample Statistics

The descriptive statistics for the sample are initially provided in Table 1, whereas the results of the regression analysis are displayed in Table 2.

TABLE 1:
SAMPLE DESCRIPTIVE STATISTICS

Variables Descriptive Statistics	Total Cost of Environmental Remediation and Pollution Control	Total Donations and Charitable Contributions
Mean	4.93	4.77
Standard Deviation	8744.18	1367.3
Minimum	13.38	286830.8
Maximum	152.58	1392166.8
Probability	0.0000	0.0399

Throughout the research period, the mean values for Environmental Remediation and Pollution Control, and

Donations and Charitable Contributions were 4.93, and 4.77, respectively, as shown in Table 1. Among these, Environmental Remediation and Pollution Control exhibited the highest standard deviation of 8744.18, suggesting a minimal effect on the performance model of the listed oil companies, a finding further supported by the significant t-statistic values in the coefficient table. In contrast, Donations and Charitable Contributions displayed the lowest standard deviation, indicating its greater relevance within the model of the study. This is consistent with the observation that Environmental Remediation and Pollution Control had the highest mean, while Donations and Charitable Contributions had the lowest mean. Furthermore, none of the variables followed a normal distribution, as noted in Table 1.

B. Environmental Costs and Return on Assets of Oil Companies in the Kurdistan Region

The findings from the Ordinary Least Squares (OLS) analysis regarding the impact of environmental costs on the performance of oil companies listed in the Kurdistan Region are examined. Environmental expenditures proxy as Environmental Remediation and Donations and Charitable Contributions in this study. Additionally, Return on Assets - net profit/ net asset value (%) was used as a measure of performance. You can find the regression results below in Table 2.

TABLE 2:
ENVIRONMENTAL COSTS AND PERFORMANCE OF QUOTED OIL COMPANIES IN KURDISTAN REGION

Companies' Performance	Environmental Costs Accounting Variables	
	Total Cost of Environmental Remediation and Pollution Control	Total Donations and Charitable Contributions
Return on Asset (t-Value)	2.97	4.88
Return on Asset (p-Value)	0.004	0.002

The model indicates that two environmental cost variables significantly influence the FP of oil industries, as determined by ROA. ERPC and DCC are found to be important at the 1% level of significance. These results imply that Kurdistan Region-listed oil companies' performance improves with increased expenditure on emissions handling, and compensation for damage to the environment, as well as regulatory compliance costs like operating materials, personnel, taxes, fines, and remediation..

CONCLUSION

Based on the findings of this study, it can be concluded that investing in environmental initiatives positively affects the performance of publicly traded oil firms in the Kurdistan Region. Therefore, organization of oil companies must prioritize their engagement in environmental matters within their local communities to exert a greater positive impact on

both their businesses and their employees' performance. By actively addressing environmental concerns, these companies can enhance their overall performance and contribute to sustainable development in their operating regions. The study recommends that oil industries in the Kurdistan Region should adopt a standardized approach for reporting ECA issues to effectively manage them. Furthermore, it concludes with several suggestions. Firstly, it emphasizes the importance of considering environmental performance as a key factor in evaluating overall company performance, highlighting that the quality of environmental performance significantly impacts other aspects of balanced performance. Additionally, the study suggests the implementation of regulations that compel economic associations to adhere to international standards aimed at protecting the environment and society from pollution. Moreover, it stresses the importance of increasing community awareness among all stakeholders regarding environmental issues, with active involvement from government bodies, ministries, and non-governmental organizations (NGOs) in educating the community about environmental concerns and the related impacts of institutional actions.

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