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# Business Resilience and Business Innovation for Sustainability

The Double-Edged Role of Artificial  
Intelligence and Other Disruptive  
Technologies

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# Preface

Scholars, practitioners, and professionals consider business innovation as a necessity to minimize business risk. Through technological innovation, businesses can adapt to societal changes and reduce the impact of both internal and external threats and risks. Business resilience is the ability to deal with challenging conditions by ensuring the existence and prosperity of the organization. In today's rapidly evolving global landscape, businesses face unprecedented challenges and opportunities. The twin imperatives of building resilience against disruptions and driving innovation for sustainable growth have become paramount for long-term success. This book delves into the complex and often paradoxical role of artificial intelligence (AI) and other disruptive technologies in navigating this intricate terrain.

While AI and related technologies offer transformative potential for enhancing business resilience—from predictive analytics for risk mitigation to automated systems for operational continuity—they also present significant challenges. Ethical considerations, potential biases in algorithms, job displacement concerns, and the environmental impact of technology development all demand careful consideration. This double-edged sword requires a nuanced understanding to harness the benefits while mitigating the risks.

This book aims to provide a comprehensive exploration of this dynamic interplay between technology, resilience, and sustainability. It is targeted towards a diverse audience, including academics, students, researchers, business practitioners, policy-makers, and anyone interested in the intersection of technology, business strategy, and sustainable development.

We explore a range of critical topics, including but not limited to technological innovation and inclusivity, sustainable educational planning and integrating technology into educational development strategies, the impact of data analytics on business intelligence, financial technology and inventory management efficiency, augmented reality and digital marketing, and many more.

This work is intended to inspire critical thinking, foster collaboration, and contribute to a more informed and responsible approach to harnessing the power of technology for the benefit of both businesses and society.

Our hope is that this book will serve as a valuable resource for navigating the complex challenges and opportunities presented by AI and other disruptive technologies in the pursuit of sustainable business excellence.

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# The Impact of Green Accounting Disclosure on the Financial Performance of European Industrial Companies During the Period 2010–2022



Ghassan Daas and Nour Abu Ridi

**Abstract** This study examines the impact of green accounting disclosure on financial performance indicators of European industrial companies during the period 2010–2022, as eight indicators of green accounting disclosure were used as independent variables, and these indicators were considered dummy variables with an amount of (0, 1), and the ROA, ROE and EPS dependent variables, and the data were extracted from the DataStream database for 1050 firms. Using multiple regression analysis, the results of the study showed a variation in the effect of green accounting disclosure indicators on the financial performance indicators of industrial companies. Environmental Expenditures Investments, Environmental Expenditures, Environment Management Team, Policy Energy Efficiency, Renewable Energy Use, Policy Emissions, and Environmental Supply Chain Management have a positive effect on the ROA, ROE, and EPS with different level. The firm size as control variable affects the impact of the green accounting disclosure on the financial performance. Finally, the study recommended a set of recommendations, including that regulations and instructions related to green disclosures and sustainability disclosures be taken into account within the company's internal strategies, and disclosures should be provided periodically to stakeholders to preserve the company's funding sources, which fundamentally affect the companies' financial performance indicators.

**Keywords** Green accounting · Financial performance indicators · ROA · ROE · Green accounting disclosure indicators

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## 1 Introduction

The environmental disturbance is increasing significantly day after day, and what helped intensify this is the industrial revolution that occurred in the late eighteenth century, when the most difficult technological or mechanical system was authorized to carry out traditional work instead of human hands [1]. We do not deny that companies provide financial reports, but at the time they failed to recognize the extent of the impact of their economic activities on the surrounding environment [2]. The concept of green accounting emerged, which calls for the process of integrating environmental costs and financial operations in a way that serves the interest of the institution and the surrounding environment, which reflects the possibility of achieving a balance between making money, people's lives, and the health of the planet [3].

Disclosure is one of the basic and necessary methods that help decision-makers make the correct decisions and thus follow green accounting standards disclosing them in the company's financial reports is one of the most important ways to know the extent of the company's responsibility toward the environment [4]. As a result of the increasing environmental risk, it has become one of the most important ways to know the extent of the company's responsibility towards the environment. It is necessary to implement environmentally friendly measures by institutions and disclose them [5].

The goal of green accounting, known as environmental accounting, is to take into account the environment and its sustainability by including environmental impacts in financial reports, and the fact that the industrial sector is one of the most important economic sectors that has the greatest impact on the environment, as it includes the manufacture of many products, some of which have environmental emissions and environmental damage. It has become a must to find out whether there is a relationship between green accounting disclosure and the financial performance of industrial companies [5].

The financial performance indicators only provided insight into an organization's financial well-being through measures such as liquidity and profitability. However, the concept of financial health has evolved and is now evaluated by considering the effective allocation of resources that incorporates both environmental costs and profitability. This approach supports sustainable growth. According to [2] highlights the importance of evaluating financial and environmental performance to achieve profitability. However, the disclosure of green accounting is still voluntary as there are no specific accounting standards regulated for this purpose. Nevertheless, SFAS No. 1 of 2009 allows companies to provide additional services in financial reports related to the environment and value-added services, especially in specific industries [6].

The unique role of social responsibility allows companies to acquire strategic resources for development, which in turn helps them earn the trust of consumers. By assessing their environmental costs and estimating their resource losses within the country, companies can demonstrate their commitment to social responsibility. It is important to note that disclosing social responsibility, whether through financial

reports or company websites, can significantly increase transparency and positively impact the long-term sustainability of the company [7].

Water and air pollution are major environmental disasters that need to be addressed. Striking a balance between environmental development and the economy is important, and this can be achieved through the use of green accounting strategies. Recently, it has been recommended that the environmental and economic accounting systems be linked by connecting natural assets accounts to income and production accounts. This follows the basic principle of national accounts and allows for the evaluation of natural resources and productive capital at any given time [4].

Green accounting, and according to previous studies [1] the concentration were on the disclosure of Environmental Expenditures Investments, Environmental Expenditures, Environment Management Team, Policy Energy Efficiency, Renewable Energy Use, Policy Emissions, Environmental Supply Chain Management and Environmental R&D Expenditures. Which is the main components collected in a formal procedure from the European firms and accordingly disclosed in the published database (**DataStream** data).

## 2 Problem Statement

According to [8] the industrial revolution that took place in the late eighteenth century has caused significant environmental damage worldwide. Due to the conflicting interests of institutions and the local communities in which they operate, it has become essential to strike a balance between economic and environmental interests. This is why accounting contribute for, specifically green accounting, which is crucial in reducing the ecological footprint of companies and demonstrating their environmental responsibility. By disclosing their green activities in their financial reports, companies can show their commitment to the environment.

Green accounting is a type of accounting that attempts to factor environmental costs into the financial results of operations, and companies that disclose environmental information are, on average, larger in terms of total assets and income, owe more and provide a higher return on investment. So, environmental disclosure is a determinant of the company's profitability or value [9]. Accordingly, this study try to examine the green accounting disclosure and the firm's performance, and the study problem aimed to answer research question of "What is the impact of green accounting disclosure on the financial performance of European industrial companies listed on the European Stock Exchange for the period 2010–2022?"

### 3 Objectives of the Study

This study aims to investigate the effects of green accounting disclosure on the financial performance of European industrial companies listed on the European Stock Exchange for the period 2010 to 2022. The study aims to achieve the following objectives:

- Determine whether companies are capable of making green accounting disclosures either within their financial reports or in a separate report.
- Analyze the impact of green accounting disclosure on the return on assets, return on equity, and earnings per share.
- Identify the impact of green accounting disclosure on the financial indicators, considering company size and quality management as control variables.

### 4 Research Importance

Green accounting is a comprehensive field that is utilized at all levels of accounting. Its primary goal is to provide accounting information to the makers and users of internal and external financial reports. This type of accounting is also utilized to identify different environmental investments to gain profits and avoid environmental accountability [10]. Many countries are still struggling to balance environmental preservation with economic development. To achieve this balance, it would be beneficial for them to adopt accounting practices related to green accounting and incorporate disclosures related to environmental impact in their financial reports [3].

All business looks for sustainability, to survive and to be going concern. So, it is important to investigate whether there is a correlation between green accounting disclosure and a company's performance. Recently, financial accounting has been a major topic of research due to its role in sustaining the environment by striking a balance between development and environmental protection while also achieving societal returns [11].

### 5 The Theoretical Framework and Hypotheses Development

Financial indicators play a crucial role in providing information about a company's financial performance and its ability to meet its obligations. They also help evaluate the company's work, determine the level of its administrative success, and ensure legal compliance.

**Legitimacy theory:** according to [12] "Legitimacy theory is crucial in explaining the organization's behavior in implementing and developing social responsibility

policies, and then communicating its results. It treats corporate social and environmental performance and disclosure of this information as a way to fulfill the organization's social contract that enables the recognition of its objectives." Also, "Theory of legitimacy asserts that the organization seeks to ensure that they are perceived as operating within the bounds and norms of their respective societies, that is they attempt to ensure, that their activities are perceived by outside parties as being "legitimate" [13]

**Green accounting:** according to [14] companies need to understand environmental reports to increase their knowledge and awareness of their responsibilities towards the environment. The local government can also use these reports to understand an organization's environmental practices. Green accounting is viewed as an accurate source of information on an organization's impact on the environment. It is often disclosed in the company's environmental report or through collective disclosure [1].

**Return on assets:** The rate of return on assets is one of the most important traditional financial indicators that are used to measure a company's performance and indicate the extent of its ability to achieve an appropriate return on assets [1, 15]. It was found that there is a close and positive relationship between environmental disclosure and the rate of return on assets [16, 17]. So, the first hypothesis can be set as:

*H01: There is positive impact of disclosing green accounting on the return on assets of European industrial companies listed on the European Stock Exchange for the period 2010–2022.*

**Return on equity:** according to [18] this indicator has great importance in attracting investors and plays a vital role in comparing institutions, especially in the industrial sector. Green accounting and practices lead to an increase in company profits, making this indicator one of the most crucial financial indicators. Social spending can also lead to an improved return on equity. Therefore, the disclosure of green social practices has a positive relationship with the return on equity [15–17]. So, the second hypothesis can be set as:

*H02: There is positive impact of disclosing green accounting on the return on equity of European industrial companies listed on the European Stock Exchange for the period 2010–2022.*

**Earnings per share:** Earnings per share is a crucial financial indicator that investors use to calculate expected profits and revenues from investing in a company's ordinary shares. The disclosure of green accounting significantly impacts the EPS. A positive disclosure of green accounting can boost demand for the company's shares and increasing its trading value. Therefore, companies should prioritize disclosing their green accounting practices to attract more investors and improve their financial performance [17]. So, the third hypothesis can be set as:

*H03: There is positive impact of disclosing green accounting on the earnings per share of European industrial companies listed on the European stock exchange for the period 2010–2022.*

**Company size:** Large companies have access to multiple financing sources, which gives them the ability to perform better and have stronger support. This strength can be reflected in the level of disclosure they provide. For instance, industrial companies, being large in size, have higher disclosures and more accurate information compared to smaller companies. This positive relationship between company size and disclosure can be useful for companies that are committed to green environmental practices [19]. So, the fourth hypothesis can be set as:

*H04: There is positive impact of green accounting disclosure on the financial performance of European industrial companies listed on the European Stock Exchange for the period 2010-2022 in light of the presence of company size as a control variable.*

**Quality Management:** according to [11], it is crucial to prioritize quality management within an organization. This administrative task is aimed at upholding a high level of product quality, which in turn plays a positive role in preserving the environment. Quality management is not limited to the product itself but also extends to the workers who are trained to produce high-quality products. The quality of these products is measured by the amount of expenses incurred, both on the product and on the workers. So, the fifth hypothesis can be set as:

*H05: There is positive impact of green accounting disclosure on the financial performance of European industrial companies listed on the European Stock Exchange for the period 2010-2022 in light of the presence of quality management as a control variable.*

## 6 Methods and Procedures

### 6.1 Data collection methods

The study collected data from the DataStream database (DataStream is a global financial and macroeconomic time-series database, providing data on equities, stock market indices, currencies, company fundamentals, fixed income securities and key economic indicators for 175 countries and 60 markets) [20], which covered the period (2010 to 2022). The companies had to be listed on European stock exchanges for the period 2010 to 2022. Data for 1050 firms were collected. Moreover, all information and disclosures related to green accounting indicators and financial indicators had to be available. For each of the green accounting disclosure the sample was selected on the data availability by each green accounting disclosure variable. Table 1 illustrates the number of observation through the study period (2010–2022) for each

**Table 1** Study sample

Variable	Observations	Variable	Observations
1.EEI = Environmental expenditures investments	5192	2-EE = Environmental expenditures	1109
3-EMT = Environment management team	5642	4-PEE = Policy energy efficiency	5648
5-REU = Renewable energy use	5640	6-PE = Policy emissions	5948
7-ESCM = Environmental supply chain management	5640	8-ERD = Environmental R&D expenditures	277

variable. No consistent disclosure for all variables. So, each variable was analyzed independently for its impact of the financial performance indicators

## 6.2 Variables

Table 2 Presents the Study Variables, Their Types, Scientific Terms, Measurement Mechanisms, and Sources of Information.

A regression model was developed to determine the effect of green accounting disclosure on the financial performance of European industrial companies listed on the European Stock Exchange.

Regression model —  $FP = \alpha_0 + \beta_1 GACC + \beta_2 FSIZ + \beta_3 QMAN + \varepsilon$ .

Where: FP: Financial performance indicator, GACC: Green accounting disclosure variable, FSIZ: Firm size, QMAN: Quality Management.

## 7 Results

The total number of 1050 European industrial companies for the period (2010 to 2022) were surveyed. The study examined a set of green accounting disclosure indicators and financial performance indicators. The selected period was based on the availability of data related to green accounting disclosure indicators, which was only available from the year 2010.

To ensure that the data used for the statistical analysis was complete and error-free, any missing data was excluded from the sample. The green accounting disclosure

**Table 2** variables definition and measurement

Variable	Variable type	Definition of variable	Measurement mechanism	Source of information
Green Accounting disclosure 1- EEI = Environmental Expenditures Investments 2-EE = Environmental Expenditures 3-EMT = Environment Management Team 4-PEE = Policy Energy Efficiency 5-REU = Renewable Energy Use 6-PE = Policy Emissions 7-ESCM = Environmental Supply Chain Management 8-ERD = Environmental R&D Expenditures	Independent	It is the impact of human activity on the Earth's environmental systems and resources, and it is an accounting that calls for a balance between the organization's interest and the environmental interest [1]	The impact of green accounting disclosure is measured by examining a group of environmental indicators within companies' reports and giving the code (1) to companies that disclose these indicators and the code (0) to companies that do not disclose these indicators	Data published in (DataStream)
Return on assets	Dependent	It is an indicator used as a measure to determine the amount of profits generated on average per unit of assets	Calculated through the following equation: net profit after tax / total assets [21]	Data published in (DataStream)
Return on equity	Dependent	It is an indicator used as a measure to determine the returns of shareholders and the potential growth of their investments	Net profit after tax / Equity [21]	Data published in (DataStream)

(continued)

**Table 2** (continued)

Variable	Variable type	Definition of variable	Measurement mechanism	Source of information
Earnings per share	Dependent	It is the ratio that indicates shareholders' profits	(Net profits after tax - dividends on preferred shares)/number of common shares [22]	Data published in (DataStream)
Quality Management	Control	It is a measure used to express the extent of the company's interest in the degree of efficiency of its products and their distinction from other products	It is measured by all expenses spent on the product and also by workers to produce the best they can [11]	Data published in (DataStream)
Company size	Control	Large companies enjoy a high volume of financing sources, and therefore they have great strength in support and great strength	Natural logarithm of total assets, [19]	Data published in (DataStream)

indicators were then organized to measure their impact on the financial performance indicators. And, additionally, the study examined the impact of company size and quality management as control variables. All the regression models for the eight independent variable indicates VIF less than 5, which indicates no multicollinearity problems.

## 8 The Impact of Disclosing Environmental Expenditure Investments (EEI) on Financial Performance (ROA, ROE, EPS)

Firms through its social and environmental responsibility have to invest in environmental protection, such investment will gain the reputation of the firm's equity. Results in Table 3 indicates that there is a significant positive impact of the of the environmental expenditure investment on the financial performance indicators (0.88, 9.975, and 0.117) for ROA, ROE, and EPS respectively. The most positive impact was for the ROE. The values of R square before and after the inclusion of the control variables are significant, then the model is fit.

By adding the control variables (Firm size) and (Quality management), the results were show significant impact of on ROA and ROE belongs to the firm size, and the

**Table 3** The Regression analysis on the impact of disclosing environmental expenditures Investments (EEI) on financial performance) ROA, ROE, EPS)

Dependent variable	Coefficient	R square/Sig	Sig coefficient	Result				
ROA	0.880	0.002/0.001	0.001 < 0.05	Significant impact				
ROE	9.975	0.001/0.026	0.026 < 0.05	Significant impact				
EPS	0.117	0.002/0.001	0.001 < 0.05	Significant impact				
<b>In the presence of QM and company size as control variables</b>								
Dependent variable	R square/Sig		Quality management			EEI		
	Coefficient	Sig	Coefficient	Sig	VIF	Coefficient	Sig	VIF
ROA	1.407	0.00	0.00	0.396	1.487	0.043	0.884	1.155
ROE	12.928	0.005/0.00	0.000	0.862	1.487	1.686	0.725	1.155
EPS	0.045	0.004/0.00	0.090	0.351	1.487	0.082	0.032	1.155

quality management insignificant for all dependents. The overall impact of the control variable on EEI, only significant for EPS. The results indicate the control variables affect the results of ROA, and ROE.

### ***8.1 The Impact of Disclosing Environmental Expenditure (EE) on Financial Performance (ROA, ROE, EPS)***

Firms through its social and environmental responsibility have to pay expenses for environmental protection, such expenses if disclosed will gain the reputation of the firm's equity. Results in Table 4 indicates that there is light significant positive impact of the environmental expenditure on the financial performance indicators (very low impact) for ROA, ROE. Compared to the environmental expenditures investment, the investment is more impact and seen on the ground. The values of R square are insignificant for all models before the inclusion of the control variables.

By adding the control variables (Firm size) and (Quality management), the results show that the values of R square are significant for ROA and EPS, then the model is fit when it is significant by adding the control variables. The results also show significant impact of on ROA belongs to the firm size, and the quality management significant for ROA and EPS. The overall impact of the control variable on EE, only significant for EPS. The results indicate the control variables affect the results of ROA, and EPS.

## **9 The Impact of Disclosing Environment Management Team on Financial Performance ROA, ROE, and EPS**

Managing the environmental impact with its policies, investment, and procedures needs to be driven by highly qualified team. Results in Table 5 indicates that there is a significant positive impact of the of the environmental management team on the financial performance indicators of ROA and EPS (1.013, and 0.89) for ROA, and EPS respectively, but with no significant impact for ROE.. The most positive impact was for the ROE even it insignificant. The values of R square are significant for ROA and EPS models before the inclusion of the control variables.

By adding the control variables (Firm size) and (Quality management), the results show that the values of R square are significant for all dependents. The results also show significant impact of on ROA and ROE belongs to the firm size, and the quality management insignificant for all models. The overall impact of the control variable on EMT, insignificant all dependents. The results indicate the control variables affect the results of ROA, and EPS. Table 5

**Table 4** The Regression results on the impact of disclosing environmental expenditures (EE) on financial performance) ROA, ROE, EPS)

Dependent variable	Coefficient	R square/Sig	Sig coefficient	Results						
ROA	7.212E-13	0.001/0.384	0.384	No significant impact						
ROE	2.371E-13	0.000/0.994	0.994	No significant impact						
EPS	1.468E-15	0.000/0.985	0.985	No significant impact						
<b>In the presence of QM and company size as control variables</b>										
Dependent variable	R Square/Sig	With size		Quality management			Independent			
		Coefficient	Sig	VIF	Coefficient	Sig	VIF	coefficient	Sig	VIF
ROA	0.026/0.00	-0.975	0.014	1.795	-4.239E-12	0.000	1.795	7.2 E-13	0.373	1.000
ROE	0.006/0.091	28.412	0.060	1.795	6.181E-12	0.984	1.795	1.62 E-13	0.996	1.000
EPS	0.018/0.00	-0.072	-0.14	1.795	6.381E-13	0.000	1.795	2.09 E-15	0.000	1.000

**Table 5** The Regression results on the impact of **disclosing Environment Management Team (EMT)** on financial performance) ROA, ROE, EPS)

Dependent variable		Coefficient	R square/Sig	Sig coefficient	Results				
ROA		1.013	0.003/0.00	0.000	Significant impact				
ROE		5.806	0.000/0.138	0.138	No significant impact				
EPS		0.89	0.001/0.04	0.004	Significant impact				
<b>In the presence of QM and company size as control variables</b>									
Dependent variable	R Square/Sig	With Size		Quality Management		Independent EMT			
		Coefficient	Sig	Coefficient	Sig	coefficient	Sig	VIF	VIF
ROA	0.015 / 0.00	1.450	0.000	-4.2E-12	0.315	0.247	0.349	1.482	1.143
ROE	0.005/0.00	12.889	0.000	6.14E-12	0.927	-1.348	0.747	1.482	1.143
EPS	0.003 /0.001	0.04	0.102	6.38E-13	0.231	0.062	0.062	1.482	1.143

## **10 The Impact of Policy Energy Efficiency on Financial Performance (ROA, ROE, and EPS)**

Managing the environmental impact with its policies, investment, and procedures that driven by highly qualified team is one side, but the impact of the pollution resulted from energy providers also highly considered. The implementation of policies in efficient manner shall be examined Results in Table 6 indicates that there is a significant positive impact of the of the Policy Energy on the financial performance indicators of ROA and EPS (4.420, and 0.224) for ROA, and EPS respectively, but with negative significant impact was for the ROE. The values of R square are significant for ROA and EPS models before the inclusion of the control variables.

By adding the control variables (Firm size) and (Quality management), the results show that the values of R square are significant for all dependents. The results also show significant impact of on ROA and ROE belongs to the firm size, and the quality management insignificant for all models. The overall impact of the control variable on PEE, significant ROA and EPS. The results indicate the control variables have no affect the results of ROA, and EPS. Table 6

## **11 The Impact of Renewable Energy Use on Financial Performance (ROA, ROE, and EPS)**

To protect the environment from the pollution impact, the clean sources of energy will decline the pollution percentage, so, the use of renewable energy will affect the protection. Results in Table 7 indicates that there is a significant positive impact of the of the renewable energy use on the financial performance indicators (2.336, 0.109) for ROA, and EPS respectively. The most positive impact was for the ROA resulted from cost reduction on the use of energy sources. The values of R square are significant for ROA and EPS models before the inclusion of the control variables.

By adding the control variables (Firm size) and (Quality management), the results show that the values of R square are significant for all dependents. The results also show significant impact of on ROA and ROE belongs to the firm size, and the quality management insignificant for all models. The overall impact of the control variable on REU, significant ROA and EPS. The results indicate the control variables have no affect the results of ROA, and EPS.

**Table 6** The Regression results on the impact of **disclosing Policy Energy Efficiency (PEE)** on financial performance) ROA, ROE, EPS)

Dependent variable	coefficient	R Square/ Sig	Sig coefficient	Result						
ROA	4.420	0.027/0.00	0.000	Significant impact						
ROE	1.992-	0.000 / 0.724	0.724	No significant impact						
EPS	0.224	0.004/0.00	0.000	Significant impact						
<b>In the presence of QM and company size as control variables</b>										
Dependent variable	R Square/ Sig	<b>With Size</b>		<b>Quality Management</b>			<b>Independent PEE</b>			
		Coefficient	Sig	VIF	Coefficient	Sig	VIF	coefficient	Sig	VIF
ROA	0.034/0.00	1.302	0.000	1.556	-1.620E-12	0.698	1.472	3.839	0.000	1.069
ROE	0.005/0.00	13.779	0.000	1.556	9.589E-13	0.989	1.472	-9.952	0.088	1.069
EPS	0.006/0.00	0.031	0.195	1.556	6.900E-13	0.193	1.472	0.200	0.000	1.069

**Table 7** The Regression results on the impact of Renewable Energy Use (REU) on financial performance) ROA, ROE, EPS)

Dependent variable	coefficient	R Square/ Sig	Sig coefficient	Results						
ROA	2.336	0.014/0.00	0.000	Significant impact						
ROE	0.012	0.000/0.998	0.998	No significant impact						
EPS	0.109	0.002/0.001	0.001	Significant impact						
<b>In the presence of QM and company size as control variables</b>										
Dependent variable	With Size		Quality Management			Independent REU				
	R Square/ Sig	coefficient	Sig	VIF	Coefficient	Sig	VIF	coefficient	Sig	VIF
ROA	0.022/0.00	1.156	0.000	1.471	-3.146E-12	0.453	1.601	1.750	0.000	1.111
ROE	0.005/0.00	14.086	0.000	1.471	1.524E-12	0.982	1.601	-7.520	0.084	1.111
EPS	0.003/0.00	0.039	0.108	1.471	6.008E-13	0.251	1.601	0.082	0.018	1.111

## **12 The Impact of Policy Emissions on Financial Performance**

To protect the environment from the pollution impact, a policy's effectiveness depends on its ability to exploit possibilities for reducing (energy-related) CO<sub>2</sub> emissions across the economy which will decline the pollution percentage, so, the use of a policy's effectiveness of emissions will affect the protection. Results in Table 8 indicates that there is a significant positive impact of the Policy Emissions on the financial performance indicators (2.725, 0.111) for ROA, and EPS respectively. The most positive impact was for the ROE (6.527) even if it is insignificant. The values of R square are significant for ROA and EPS models before the inclusion of the control variables.

By adding the control variables (Firm size) and (Quality management), the results show that the values of R square are significant for all dependents. The results also show significant impact of on ROA and ROE belongs to the firm size, and the quality management insignificant for all models. The overall impact of the control variable on PE, significant ROA. The results indicate the control variables have an effect on the results of EPS.

## **13 The Impact of Environmental Supply Chain Management on Financial Performance (ROA, ROE, and EPS)**

Environmental supply chain management recognizes the crucial role to be played by the purchasing and the function's involvement in activities that include reduction, recycling, reuse and the substitution of materials. Results in Table 9 indicates that there is a significant positive impact of the Environmental supply chain management on the financial performance indicators (1.466, 8.750) for ROA, and ROE respectively. The most positive impact was for the ROE (8.750). The values of R square are significant for ROA and ROE models before the inclusion of the control variables.

By adding the control variables (Firm size) and (Quality management), the results show that the values of R square are significant for all dependents. The results also show significant impact of on all dependents belongs to the firm size, and the quality management insignificant for all models. The overall impact of the control variable on ESCM, significant ROA. The results indicate the control variables have an effect on the results of ROE. Table 9

**Table 8** The Regression results on the impact of Policy Emissions (PE) on financial performance) ROA, ROE, EPS)

Dependent variable	coefficient	R Square/ Sig	Sig coefficient	Results						
ROA	2.725	0.011/0.00	0.000	Significant impact						
ROE	6.527	0.000/0.224	0.224	No Significant impact						
EPS	0.111	0.001/0.010	0.010	Significant impact						
<b>In the presence of QM and company size as control variables</b>										
Dependent variable	With Size		Quality Management			Independent PE				
	R Square/ Sig	coefficient	Sig	VIF	Coefficient	Sig	VIF	coefficient	Sig	VIF
ROA	0.020/0.00	1.198	0.000	1.604	-2.317E-12	0.582	1.479	1.969	0.000	1.103
ROE	0.005/0.00	12.846	0.000	1.604	6.492E-12	0.923	1.479	-1.854	0.742	1.103
EPS	0.003/0.001	0.043	0.073	1.604	6.247E-13	0.240	1.479	0.077	0.085	1.103

**Table 9** The Regression results on the impact of Environmental Supply Chain Management (ESCM) on financial performance) ROA, ROE, EPS)

Dependent variable	coefficient	R Square/ Sig	Sig coefficient	Results						
ROA	1.466	0.005/0.00	0.000	Significant impact						
ROE	8.750	0.001/0.040	0.040	Significant impact						
EPS	0.031	0.000/0.368	0.368	No significant impact						
<b>In the presence of QM and company size as control variables</b>										
Dependent variable	With Size		Quality Management			Independent ESCM				
	R Square/ Sig	coefficient	Sig	VIF	Coefficient	Sig	VIF	Coefficient	Sig	VIF
ROA	0.016/0.000	1.354	0.000	1.710	-3.250E-12	0.445	1.500	0.626	0.032	1.175
ROE	0.005/0.00	12.336	0.000	1.710	1.040E-11	0.877	1.500	0.825	0.858	1.175
EPS	0.002/0.003	0.059	0.019	1.710	5.122E-13	0.339	1.500	-0.010	0.783	1.175

## **14 The Impact of Environmental R&D Expenditures on Financial Performance (ROA, ROE, and EPS)**

Previous research found a positive association of environmental performance with financial performance [23]. Results in Table 10 indicates that there is insignificant impact of the Environmental R&D Expenditures on the financial performance indicators. Also the results still insignificant through adding the control variables. This result due to the role and responsibilities of the firms to pay not to be part of R&D activities. The values of R square are insignificant for all models before and after the inclusion of the control variables. Table 10

## **15 Conclusions and Recommendations**

### ***15.1 Conclusions***

The results of the current study showed that environmental expenditure investments and expenditure have a positive impact on the financial performance indicators. The results of the study was in agreement with the study of [22] proving the existence of an impact of green accounting disclosure on both assets and equity the study also showed the positive impact of the index on earnings per share, and therefore the results of the current study agreed with the results of the study of both [17, 2, 24], Which all found a positive impact of green accounting disclosure on financial performance indicators.

The current study also found that there was an impact of the Environment Management Team, which is one of the indicators of green accounting disclosure consistent with. [6], which found an impact of green accounting disclosure on financial performance indicators. The current study concluded that Policy Energy Efficiency affects the return on assets and EPS. The result agreed with a study of [8] that found an effect of green accounting disclosure on the return on assets. Also, the result of the current study differed with the [5], which found an impact of green accounting disclosure on both return on equity and return per share.

The current study found an impact of Renewable Energy Use on financial performance indicators, this agreed with [19], the results. The study also concluded that there is an impact of Policy Emissions on the return on assets, and this study agreed with [18], in that it reached the same result. For the effect of both Environmental Supply Chain Management has an impact on financial indicators, whereas Environmental R&D Expenditures indicates no effect on the financial performance indicators, Therefore, the results of this study [1] agreed with the study that concluded the same result.

The overall conclusion of the results that firms intersted with the envirnmental disclosure that be sensitive and attractive to the readers of the reports which mailly consentated on the investment, expenditures, renewable energy, redusing the pollution

**Table 10** The Regression results on the impact of Environmental R&D Expenditures (ERD) on financial performance) ROA, ROE, EPS)

Dependent variable	Coefficient	R square/Sig	Sig coefficient	Results						
ROA	1.227E-10-	0.002/0.557	0.557	No significant impact						
ROE	7.598E-10	0.003/0.421	0.421	No significant impact						
EPS	-1.244E-11	0.000/00.793	0.793	No significant impact						
<b>In the presence of QM and company size as control variables</b>										
Dependent variable	With Size		Quality Management			Independent ERD				
	R square/Sig	coefficient	Sig	VIF	Coefficient	Sig	VIF	coefficient	Sig	VIF
ROA	0.007/0.664	-0.940	0.258	2.523	1.337E-11	0.539	6.214	-1.9E-10	0.628	3.722
ROE	0.010/0.545	-2.189	0.559	2.523	1.163E-10	0.237	6.214	-1.12E-9	0.538	3.722
EPS	0.010/0.530	-0.264	0.162	2.523	3.118E-12	0.528	6.214	-2.01E-11	0.826	3.722

and managing the environmental activities. The overall effect of the control variables indicates that the firm size has an impact on the results due to the capacity of the researched firms, whereas the quality management as control variable have no effect.

## 16 Recommendations

It is clear that most of the green accounting disclosure components have an impact on the financial performance indicators, so, the research recommend that firms shall enhance expenditures to protect environment as social responsibility for both operating expenses and investments. It is recommended to get more emphases on the reporting issues that disclose the environmental impact as green accounting practices.

Issuing legislations through which bodies can force companies to integrate environmental costs into the companies' strategic and operational plan, in addition to publishing accounting standards and guidelines issued by standard-setting accounting bodies, whether local or international, in order to be held legally accountable for them.

Disclosing costs and matters related to the environment and making stakeholders constantly aware of them that will increase the confidence of investors, whether current or potential, and thus leads to an increase in the company's investments to achieve significant returns.

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