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Green Accounting Practices and Economic Value Added: An Applied Study on Companies Listed on the Qatar Stock Exchange

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ABSTRACT

The purpose of this study is to reveal the reality of green accounting practices and their effects on economic value-added (EVA) of the listed companies on the Qatar Stock Exchange (QSE). Content analysis was used to gather study data. The sustainability reports and all other materials related to green accounting subject published by the study sample during the period (2014-2019) was deeply viewed. The study applied on seven sectors consists of 47 companies listed in the Qatar exchange selected based on data availability. The study concluded that the quality of green accounting practices in the listed Qatar companies was weak, was its average in the banking and financial services sector and the telecommunications sector, whereas it's weak in the insurance and real estate sectors. The study also found that there is a statistically significant effect of green accounting on the EVA of listed Qatari companies. The study also found that there is a statistically significant effect of green accounting on EVA of listed Qatari companies. Moreover, energy, materials, and emissions variables have a negative effect on EVA.

Keywords: Green Accounting, Water, Materials, Emissions, Energy, Economic Value-Added

JEL Classifications: Q4, Q53

1. INTRODUCTION

It has become a well-known fact that industrial companies have contributed to pollution and have thus destroyed many natural resources. Calls for attention to environmental issues have increased particularly in the last two decades of the last century, pressures that require companies to shoulder their responsibilities to society and the environment. As a result, in 1987 the United Nations formed a body known as the Brundtland Commission, chaired by former Prime Minister Gro Harlem Brundtland, with the aim of reviewing the deteriorating global environment, living conditions, health, and natural resources of life. Our Common Future emphasizes the need to create healthy, environmental, and social systems for the continuity of economic development. Since then, there has been the talk of social and environmental responsibility, followed by sustainability in its final chapter.

The current financial information provided by the accounting to the community in its annual financial statements is no longer sufficient for the environment and the community. This has forced the accounting profession to change its traditional role of maximization of the wealth of owners to achieve welfare to the society as a whole. According to that, companies have to respond to stakeholders' expectations for greater transparency on how environmental, social, governance and other non-financial measures affect their strategies, operations, and long-term prospects.

In this regard, the State of Qatar is the world's largest gas exporter. As the United Nations noted in its report under the title of (United Nations Framework Convention on Climate Change) published in 2011 stated: Qatar ranks first in the world in terms of carbon emissions per individual consumption. On the ground, Qatar's efforts in the field of environmental sustainability should be

mention. since 2008 State of Qatar move towards the concept of sustainable development as a general strategy (Vision 2030) aimed to achieve a balance between economic, human, social and environmental development by supporting international efforts to reduce the adverse effects of climate change, and adopt preventive measures to mitigate the negative effects of pollution caused by economic activities on the environment and society.

The current study seeks to achieve two main goals:

- i. To investigate the quality of green accounting practices by the listed Qatari industrial companies.
- ii. To examine the effect of green accounting indicators on creating economic value added (EVA) of the listed Qatari industrial companies.

2. LITERATURE REVIEW AND PREVIOUS STUDY

Green or environmental accounting is one of the modern concepts in accounting thought, which has attracted great interest among many researchers, scientific bodies, and government agencies. This concern is the result of pressure exerted by government agencies and associations that care about the well-being of society as well as not harming the environment.

International Federation of Accountants (IFAC) defined green accounting as a process of identification, collection, analysis, and use of physical information on the use, flow, and destinies of energy, water, and materials and monetary information on environment-related costs, earnings, and savings. Also, the IFAC definition focused on the accountant and auditor roles in tracking or verifying environment-related information in financial and other reports (IFAC, 2005). While the Environmental Protection Agency (EPA) was more specific in its definition of environmental accounting concept to include: (1) National income accounting, (2) Financial accounting, (3) Internal business managerial accounting (EPA, 1995). In this context, the United Nations (UN) referred to green accounting as an economic and environmental information system used to measure the contribution of the environment to the economy, and the impact of the economy on the environment (UN, 2014).

According to the Global Reporting Initiative (GRI), the environmental dimension concerns an organization's impacts on living and non-living natural systems, including land, air, water, and ecosystems (GRI, 2016). Besides, the environmental dimension can be measured using the following aspects:

- i. **Materials:** Consists of all raw materials used in the manufacturing and packaging process. In this regard, the organization's contribution to resource conservation can be indicated by its approach to recycling, reusing, and reclaiming materials, products, and packaging.
- ii. **Energy:** Consists of all energy consumed by an organization such as fuel, electricity, heating, cooling, or steam. The organization's contribution to energy conservation can be indicated by using energy more efficiently and opting for renewable energy sources are essential for combating

climate change and for lowering an organization's overall environmental impact.

- iii. **Water and Effluents:** Deals with how an organization is concerned with water consumption how and where water is withdrawn, consumed, and discharged linked to the organization's activities, products, or services as a shared resource.
- iv. **Biodiversity** are all operational activities of organizations that are adverse effects directly or indirectly on biodiversities, such as construction, or use of manufacturing plants, mines, and transport infrastructure.
- v. **Emissions:** Consists of all emissions have significant adverse impacts on ecosystems, air quality, agriculture, and human and animal health. Including greenhouse gas (GHG), ozone-depleting substances (ODS), and nitrogen oxides (NOX), and sulfur oxides (SOX). The organization's contribution to this matter can be indicated by any efforts toward emission reduction.
- vi. **Effluents and Waste:** This includes water discharges; the generation, treatment and disposal of waste; and spills of chemicals, oils, fuels, and other substances that can to human health and the environment. the organization's contribution in this matter can be indicated by efforts to effluents and waste reduction such as waste minimization strategies emphasize prioritizing options for reuse, recycling, and then recovery over other disposal options to minimize ecological impacts.
- vii. **Environmental compliance:** Is the extent of the organization's compliance with environmental laws and regulations, including international declarations, conventions, and treaties, as well as national, sub-national, regional, and local regulations.

Through reviewing previous studies, most of them found that there is a relationship between environmental and financial performance. Yang et al. (2020) study found that the disclosure of environmental information positively affected the value of listed Chinese companies. Also, Murdiawati and Akuntansi (2019) pointed out that the disclosure of greenhouse gas emissions and environmental performance positively affects the financial performance of listed Indonesian companies. In this line, Lu and Taylor (2018) conducted a study on 500 big-size US companies that included 20 sectors. Study results indicated that services companies have good environmental practices, in addition, there is a positive relationship between environmental performance and financial performance. Di Pillo et al. (2017) conducted an investigation study on the relationship between CO₂ emissions and the financial performance of 236 Italian companies. The study pointed out that the paper and food sector have less CO₂ emissions comparing with other sectors, also the study reveals a positive relationship between CO₂ emissions and the ROI and ROE. In addition, Muhammad et al. (2015) conducted a study on Australian listed companies, the study found there is a strong positive relationship between environmental and financial performance through (2001-2017) and no relationship between environmental and financial performance through financial crisis (2008-2010). Ong et al. (2014) applied a study on 100 Malaysian companies listed on the stock exchange to reveal the relationship between environmental accounting indicators and financial performance. The study revealed that service and commercial companies have a good level of environmental

accounting implementation, moreover the study found that there is a weak relationship between environmental accounting indicators and financial performance, and it also found a positive relationship between water, energy, and water with ROA and ROE. In contrast, Yuliarin et al. (2017) conducted a field study on a sample of managers in some Malaysian companies. The study pointed out that the environmental accounting practices in Malaysian companies are weak due to the lack of a framework governing environmental accounting practices. Also study of (Budiharjo, 2019) found there is an effect of environmental performance on the company value of Indonesian listed companies, but it not significant.

On the other hand, some studies have found that there is a negative relationship between environmental and financial performance. Where the study of (Alexopoulos et al., 2018) pointed out Greek manufacturing companies with good environmental practices tend to have low financial performance due to high environmental costs. In addition, Deswanto and Siregar (2018) found both environmental performance and disclosure do not affect Indonesian firms' value. Moreover, the Study of (Raju, 2018) pointed out environmental accounting practices in Indian companies are not strong, due to the inability of Indian companies to measure environmental performance and costs, in addition to that there are no laws requiring this or bodies regulating these practices. As well as, the study of (Zhang and Chen, 2017) concluded environmental performance negatively affects financial performance in the short-term and positively in the long-term of listed Chinese companies.

3. STUDY HYPOTHESES

In order to meet the study objectives, the following hypotheses were formulated:

- H_{0.1}: The listed Qatari companies have a weak application of green accounting.
- H_{0.2}: There is no statistically significant impact of green accounting application on creating economic value added (EVA) of the Qatari industrial sector.

The sub-hypotheses are derived as follows:

- H_{0.2.1}: There is no impact of materials consumption on creating economic value added (EVA) of the Qatari listed companies.
- H_{0.2.2}: There is no impact of energy consumption on creating economic value added (EVA) of the Qatari listed companies.
- H_{0.2.3}: There is no impact of water consumption on creating economic value added (EVA) of the Qatari listed companies.
- H_{0.2.4}: There is no impact of emissions on creating economic value added (EVA) of the Qatari listed companies.

4. VARIABLES AND MODEL OF STUDY

In order to examine the impact of green accounting on creating economic value-added (EVA), the following indicators were developed:

4.1. Independent Variables

Green accounting indicators were developed through a deep study of all Global Reporting Initiative (GRI) reports and sustainability reports published by the study samples, Moreover, the study relied on the Qatar stock exchange sustainability and ESG dashboard as a source of data as follow in Table 1.

For test whether the company applies good green accounting practices, the researcher developed the following measurements in Table 2.

4.2. Dependent Variable

Traditional accounting techniques used to assess an entity's position are based on multiple accounting profits - such as return on assets (ROA), return on equity (ROE), earnings per share (EPS), and cash flow from operations (CFO). These measures have been criticized for their estimation and are influenced by the accounting methods used, thus the inability to accurately measure the economic value of entities (Kaur et al., 2019). The need for more accurate tools

Table 1: Green accounting indicators

Dimension	Sub-components	Measurement
Materials	Plastic bottles consumption	• [(Plastic bottles consumption last year - Plastic bottles consumption current year)/Plastic bottles consumption last year * 100]
	Paper consumption	• [(Paper consumption last year - Paper consumption current year)/Paper consumption last year * 100]
Energy	Fuel consumption	• [(Fuel consumption last year - Fuel consumption current year)/Fuel consumption last year * 100]
	Electricity consumption	• [(Electricity consumption last year - Electricity consumption current year)/Electricity consumption last year * 100]
Water	Water consumption	• [(Water consumption last year - Water consumption current year)/Water consumption last year * 100]
Emissions	Emissions consumption	• [(Emissions consumption last year - Emissions consumption current year)/Emissions consumption last year * 100]

Table 2: Test the extent of quality of green accounting practice

Materials	Energy	Water	Emissions
Plastic bottles consumption 12.5%	Paper consumption 12.5%	Fuel consumption 12.5%	Electricity consumption 12.5%
		Water consumption 25%	Emissions consumption 25%
Each disclosed aspect of green accounting, it will give a score of 25%, thus the quality of green accounting practices it will score as follows:			
Excellent 76-100%	Good 51-75%	Intermediate 26-50%	Weak 0-25%

has become urgent by relying on various standard methods such as Value Based Management (VBM), which provides a high perception of stock value and also Cash Value Added (CVA) and Economic Value Added (EVA) developed by Stern. In 1989, Stern Stewart and Co. provided more accurate standard methods than conventional and inaccurate accounting methods (Al-Afeef, 2017). According to the previous, the economic value added (EVA) was used to measure entities' performance and as a dependent variable. The calculation of EVA illustrated as follows:

$$EVA = NOPAT - (WACC * Capital Invested)$$

Where, NOPAT = Net Operating Profits after Tax, WACC = Weighted Average Cost of Capital and Capital invested = Equity + long-term debt at the beginning of the period.

4.3. Study Model

In purpose examine the impact of green accounting application on creating economic value-added, the following multiple linear regression equation was formulated:

$$EVA_{it} = \alpha_0 + \beta_1 MC_{it} + \beta_2 EC_{it} + \beta_3 WC_{it} + \beta_4 EM_{it} + \varepsilon_{it}$$

Where, $\beta_1, 2, 3, 4$ = Coefficient of independent variables, EVA = Economic Value-added, MC = Material consumption, EC = Energy consumption, WC = Water consumption, EM = Emission, ε = Random error.

5. RESULTS

5.1. Study Sample and Data

Content analysis was used to gather study data. The sustainability reports and all other materials related to green accounting subject published by the study sample during the period (2014-2019) was deeply viewed. The study applied on seven sectors consists of 47 companies listed in the Qatar exchange selected based on data availability, and three companies were excluded because its listed date is after 2014.

5.2. Hypotheses Test

Pearson correlation coefficient was used to test the relationships between study variables to know the nature of the direction and strength of the relationship between these variables. The results show that all relationships between study variables are positive and statistically significant at the level of significance (0.05), and it is noted that the relationships ranged between (0.708-0.505), where the highest value of the correlation coefficient (R) between the two variables (materials and water) was (Table 3).

5.2.1. Test of first main hypothesis

Table 3 shows the result of the first-main hypothesis test as it indicates that the quality of green accounting application in the companies listed in the Qatar market was weak (15.74%), and this result can be explained by the application of green accounting indicators in the State of Qatar is not mandatory as there is no agreed framework of apply green accounting. also, the results showed that the quality of green accounting application was average in the banking and financial services sector and the telecommunications

Table 3: Pearson correlation coefficient

#	Variable	1	2	3	4
1	Materials	1.00			
2	Energy	0.64	1.00		
3	Water	0.708 *	0.601	1.00	
4	Emissions	0.505 *	0.592	0.634	1.00

*Statistically significant at the significance level of 0.05

Table 4: Quality of green accounting application

Sector	Mean (%)	Green accounting quality
Banks and financial services	52.3	Intermediate
Consumer goods and services	12.2	Weak
Industrials	8.8	Weak
Insurance	2.1	Weak
Real Estate	1	Weak
Telecoms	28.1	Intermediate
Transportation	5.7	Weak
Overall average	15.74	Weak

Table 5: Multiple linear regression test of the second-main hypothesis

Correlation coefficient (r)	R ²	Sig. F	P-value	Decision
0.636	0.453	67.913	0	Reject

sector as it reached 52.3% and 28.1%, respectively, which is the highest among other sectors (Table 4). In contrast, the quality of green accounting applications in the insurance and real estate sectors was the lowest as it reached 2.1% and 1%, respectively.

5.2.2. Test of second main hypothesis

The second-major hypothesis aims to test the effect of environmental accounting variables on the economic value-added (EVA) in Qatari listed companies. The following Table 5 shows the results of the multiple linear regression test.

Table 5 shows the significance of (f) reached (67.493), which is significant at ($\alpha \leq 0.05$). It is clear that the value of the multiple correlation coefficient (r) of the effect of green accounting variables on the economic value-added (EVA) reached (0.636), and it is also clear that the R² coefficient value reached (0.453), and this indicates that the green accounting variables as a whole were explained of (45.3%) of change in the independent variable. To determine the direction of the statistically significant variables, the simple linear regression is shown in the following Table 6.

From the Table 6, we can see that the energy variable has a negative effect on the economic value-added (EVA), where the value of the beta coefficient β is (-0.001) and (t) value is (-17.023) at the level of significance (Sig = 0.000), which is less than the level of significance ($0.05 \geq \alpha$). This means that the increase in energy consumption increases operating expenses, thus operating income decreases, which negatively affects the economic value-added (EVA) of the company. This is consistent with a study (Murdiawati and Akuntansi, 2019), (Budiharjo, 2019) and (Ong et al., 2014). Accordingly, the null hypothesis is rejected and we accept the following alternative hypothesis: There is an impact of materials consumption on creating economic value-added (EVA) in the Qatari listed companies.

Table 6: Simple linear-regression

Variables	β	Standard error	t-tests	Significance	Decision
Energy	-0.001	0.0004	-17.023	0.000	Reject
Materials	-0.294	0.0001	-6.60	0.000	Reject
Emissions	-0.181	0.0005	-2.25	0.026	Reject
Water	0.127	0.0010	1.380	0.180	Accept

Besides, materials variable negatively affected economic value-added (EVA), where the value of the beta coefficient β is (-0.294) and (t) value is (-6.60) at the level of significance (Sig = 0.000), which is less than the level of significance ($0.05 \geq \alpha$). This means an increase in materials consumption leads to decreases in economic value-added (EVA). This result is consistent with a study (Murdiawati and Akuntansi, 2019), (Budiharjo, 2019) and (Ong et al., 2014). Accordingly, the null hypothesis is rejected and instead, we accept the following alternative hypothesis: There is an impact of materials consumption on creating economic value-added (EVA) in the Qatari listed companies.

Also, as a Table 6 mentioned that the emissions variable has a negative effect on economic value-added (EVA), where the beta coefficient β is (-0.181) and the t-test is (-2.25) at the level of significance (Sig. = 0.026), which is less than the level of significance ($0.05 \geq \alpha$). This means an increase in emissions leads to decreases in economic value-added (EVA). This result is consistent with a study by Pillo et al. (2017) and Murdiawati and Akuntansi (2019). Accordingly, the null hypothesis is rejected and instead, we accept the following alternative hypothesis: There is an impact of emissions on creating economic value-added (EVA) in the Qatari listed companies.

In contrast, there is no statistical effect of water variable on economic value-added (EVA), where the beta coefficient β is (0.127) and the t-test is (1.380) at the level of significance (Sig. = 0.180), which is more than the level of significance ($0.05 \geq \alpha$). This result disagrees with the study (Murdiawati and Akuntansi, 2019), (Budiharjo, 2019) and (Ong et al., 2014). Accordingly, we accept the null hypothesis.

6. CONCLUSION

The study concluded that the quality of green accounting practices in the listed Qatar companies was weak (15.74%). Also, the results showed that the quality of green accounting practices was average in the banking and financial services sector and the telecommunications sector as it reached 52.3% and 28.1%, respectively, which is the highest among other sectors. In contrast, the quality of green accounting applications in the insurance and real estate sectors was the lowest as it reached 2.1% and 1%, respectively. The study also found that there is a statistically significant effect of green accounting on the EVA of listed Qatari companies. The study also found that there is a statistically significant effect of green accounting on EVA of listed Qatari companies. Moreover, energy, materials, and emissions variables have a negative effect on EVA. Whereas, there is no statistical effect of the water variable.

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