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Dear Authors,

We are pleased to inform you that your research article No. **jgsr15920066** entitled; "***The Role of Environmental Accounting in Achieving Sustainability for Industrial Companies***" has been accepted for publication in *Journal of Global Scientific Research in Social Sciences and Humanities*. The manuscript will appear online in Volume 7, Issue 4 of April (2022).

Thank you for publishing your work with *Journal of Global Scientific Research in Social Sciences and Humanities*.

Sincerely Yours

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The role of environmental accounting in achieving sustainability for industrial companies

Abstract:

Environmental degradation has become a major global issue that much attention has been drawn to it from researchers, policymakers, lawmakers, environmental activists and the general public. The current review presents a survey of the job of natural bookkeeping on feasible advancement like methodology, estimating maintainable turn of events, and assessing the effect of components on the utilization of ecological representing supportable turn of events. the information of industrial companies was chosen to be used in this study. Structural equation modelling (SEM) was used to analyze the recorded data. The outcomes uncovered that familiarity with investors and senior administration, business elements of the organizations, accentuation on submitting to natural assurance rules, monetary, data and official obstructions, and business benefits on ecological bookkeeping significantly affected creating natural representing practical turn of events.

Key words: Environmental accounting, sustainable development , industrial companies, PLS-SEM

Introduction:

Rapid industrialization and intensive globalization had has caused harmful and widespread impacts on the natural environment, including pollution, environmental pollution, and high reduction 'of natural resources . Companies, as the main source of environmental degradation (Jahanshahi and Berm, 2018), are enduring a great amount of pressure to implement the required corrections and ensure conserving the environment besides achieving financial goals (Zhou *et al.*, 2018). So, sustainable development is essential for conserving any organizations in the modern age (TU *et al.*, 2015). Among different concepts presented by researchers to promote sustainable development, environmental accounting (green) is one of these concepts to consider the ecological effects of companies' activities on the common accounting systems.

First topic: Research methodology

1-1- Problem statement

According to Schaltegger and Burritt (2000), environmental accounting is introduced as “a branch of accounting that deals with activities, methods and systems, recording, analysis and reporting, environmentally brought financial effects and ecological effects of a defined economic system”. Therefore, environmental accounting is considered to be the main part of the environmental decision-making process in the organizational section (Buddi, 2020). The current study aimed to evaluate the performance of environmental accounting in achieving sustainability for industrial companies.

2-1-The importance and necessity of the research

The importance of environmental accounting is obvious in recent expansions of laws and rules which made companies implement EA methods and disclose environmental information for the reference of interested parties (TU *et al.*, 2015). Countries such as Denmark and the Netherlands, the United States, and Japan are required by special laws to disclose environmental information to the government. Nowadays, multinational corporations evaluate that their suppliers have disclosed green accounting information before proceeding with transactions (TU *et al.*, 2015; Park *et al.*, 2014).

3-1-Research objectives

The implementation of the best methods (environmental accounting methods) in different parts of a company depends on several factors including the political, monetary and lawful conditions of nations, and mental variables of the administrations (Thoradeniya, 2015; Manrique, 2017). Since determining key factors are necessary to make and apply policies, an accurate evaluation of these factors is undeniable.

4-1- Research hypotheses

The main hypotheses of this study are as follows: The awareness of shareholders and senior management, business features of the companies, emphasis on obeying environmental protection rules, financial, information and official barriers, and business benefits on environmental accounting is significantly effective in developing environmental accounting for sustainable development.

5-1- Research sample

The research community is a sample of Iraqi industrial companies, and the question of general managers and accountants working in these companies was targeted.

Second topic: Research theoretical foundations

2-1- The role of accounting in sustainable development

Despite many quantities of economical improvement and sustainable development plans, the absence of norms, rules, and comparable plans has made difficulties for the current manageable turn of events. Accounting requires a more representative answer to sustainable development. It facilitates the formation of government policies and institutions in the field of sustainability and also some issues including Carbon accounting and sustainable accounting develops to study the challenges of climate change (Ngwakwe, 2012). It's needed for each company to have a sustainable and clear report. In addition, the company must focus on preparing environmental accounting reports as well as the obligation to disclose information related to bribery, corruption, human rights and human capital management. The future sustainability of the company should be the basis of the decision-making process of the company, this should lead to the improvement and development of not only the individual companies but also the quality of the market Securities (Raghu & Rao, 2016).

2-2- Content of environmental sustainability accounting

Excessive exploitation of natural resources, waste and greenhouse gas emissions are due to direct or indirect use of them, which has led humans to approach or even cross important planetary boundaries. Strong knowledge based on social metabolism is the physical exchange between society and the natural environment and the associated production and consumption processes necessary to promote more sustainable resource use strategies. The flow of raw materials at the level of the economy is defined as a framework that provides an unchanging set of input materials to national economies, changes in the material reserves of the economic system, and the beginning of their embodiment to other economies and environments. To describe the components of the natural environment (minerals, fuels, animals and plants, ecosystems), the term "natural resources" has been used extensively. Therefore, the serious need to implement more efficient methods of accounting for "natural resources" for their management is currently not reflected in the standard accounts. These issues should be included in relevant economic and environmental policies (Teramaet al., 2015).

2-3-Sustainable accounting - approach and measure

In the European natural commission's fifth activity program, the job of business and representing supportable advancement is reflected and entitled as Towards Sustainability (European Commission, 1992). Because of the modern tension on ecological results from two primary elements, business and bookkeeping are associated with a practical turn of events: creation and utilization level, and natural strain on every creation unit and consume. To make this decrease compelling is required powerful estimation through the acknowledgement and task of costs and expenses for normal assets. Since bookkeeping data guides arrangement and choice administration exercises and moves business conduct, it should be an instrument for expected administration to propel the organization's ecological management(Ngwakwe, 2012).

Third topic: Research methods

3-1-Statistical population of the study

The industrial companies were the statistical population of the study. The collected data was analyzed using SmartPLS and SPSS software. Cochran's formula was used to sample and determine the sample size. Cochran's formula is calculated as follows:

$$n = \frac{\frac{z^2 pq}{d^2}}{1 + \frac{1}{N} \left(\frac{z^2 pq}{d^2} - 1 \right)}$$

3-2-Data collection tools

The questionnaire was the main instrument for collecting data in the present study. The questionnaire is the main instrument for collecting data in survey research. It is a set of standardized questions used to gather data from respondents about their attitudes, experiences, or opinions to evaluate them. After preparing the selected questionnaire and choosing the selected samples, the validity and reliability of the questionnaire were assessed and it was distributed.

3-3- Measuring study variables

The research questionnaire is based on the literature review of the second chapter. This questionnaire was a 5-point Likert-type scale with 18 items. The organizational capability was separately measured using it.

Table (1-3): Components and items of the organizational capability questionnaire

Number	Studied components	Items related to each component	overall
1	Awareness	1-3	18
2	Business features	4-6	
3	Awareness of senior managers	7-9	
4	Emphasis on obeying rules	10-12	
5	Financial, information and official barriers	13-15	
6	Business benefits	16-18	

To help for the study research, the Likert scale was utilized. The format of five-point Likert scale is : 1 = “very low”; 2 = “low”; 3 = “medium”; 4 = “high”; 5 = “very high”.

3-4-Data analysis

The collected data from the questionnaire were analyzed using structural equation modelling with partial least squares (PLS) and SmartPLS software. Smart PLS is a practical software for designing structural equation models, in which users can use graphical cursors instead of writing long and complicated orders.

Evaluating the hypotheses of structural equations

Analyzing the recorded data using the approach of structural equations consists some assumptions as follows:

Table (1): Kolmogorov-Smirnov test to evaluate the research variables

Variable	Value of test statistics	Significant level (<i>p</i>)
Awareness	1.44	0.000
Business features	1.48	0.000
Awareness of senior managers	1.41	0.000
Emphasis on obeying rules	1.60	0.000
Financial, information and official barriers	1.36	0.000
Business benefits	1.72	0.000

Since the significant level for research variables were less than 0.05, it can be concluded that the recorded data for the research variables are abnormal. Because the data of the present study were abnormal, the partial least squares (PLS) was used to evaluate the research model.

Hypotheses test using linear structured relationships

The results of evaluating the hypotheses are reflected in the figure.

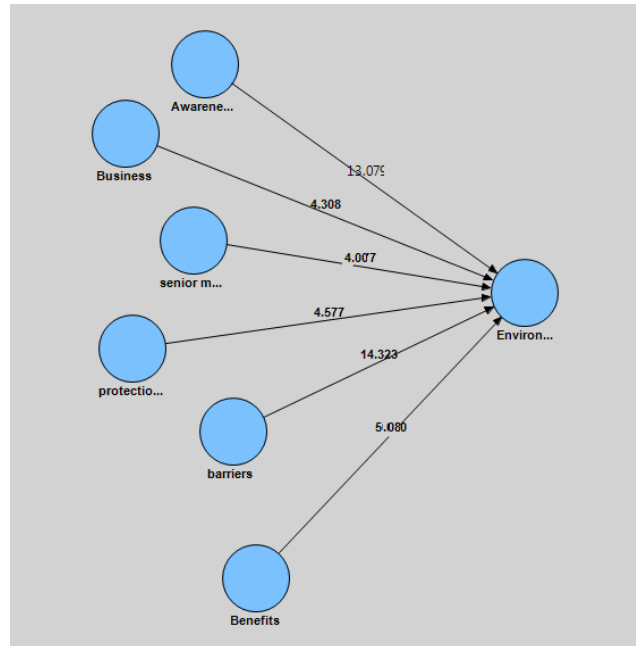


Figure (1): T-coefficients of the tested research model

Reliability

The reliability of the index is evaluated by two criteria including:

1. Cronbach's alpha
2. Combined reliability
3. Convergent validity

Table (2): Cronbach's alpha test

Variables	Alpha value	CR	AVE
Awareness	0.62	0.77	0.46

Business features	0.71	0.82	0.54
Awareness of senior managers	0.63	0.81	0.47
Emphasis on obeying rules	0.69	0.79	0.58
Financial, information and official barriers	0.60	0.86	0.68
Business benefits	0.89	0.92	0.63
Environmental accounting	0.69	0.78	0.64

Evaluate the overall model fit

The GOF criterion is related to the general section of structural equation models. This means that by this criterion, the researcher can also control the fit of the general part after examining the fit of the measurement section and the structural part of the general research model.

Table (3): The GOF criterion

Variable	Communality	R square
Awareness	0.46	
Business features	0.54	
Awareness of senior managers	0.47	
Emphasis on obeying rules	0.58	
Financial, information and official barriers	0.68	
Business benefits	0.63	
Environmental accounting	0.64	0.92
Mean	0.57	0.92

According to the value of R^2 , communality is recorded 0.57. So, the GOF value in the present research model is as follows:

$$GOF = \sqrt{0.57 \times 0.92} = 0.72$$

According to 0.01, 0.25, and 0.36 values that indicate weak, moderate, and strong overall fit, respectively, a GOF of 0.72 shows strong evaluating of the model. Considering strong evaluation of the overall fit of the model, the research hypotheses can be now examined.

Investigating the hypotheses

The cause-and-effect relationship of the research components was evaluated using SmartPLS software, after the standard had been estimated.

Table (4): the results of the hypotheses

Hypotheses	Standard	Significant level	Result
The awareness of shareholders had a positive effect on environmental accounting for sustainable development	0.166	13.079	Confirmed
The awareness of senior managers had a positive effect on environmental accounting for sustainable development	0.210	4.007	Confirmed
Business features of the companies had a positive effect on environmental accounting for sustainable development	0.210	4.308	Confirmed
Emphasis on obeying environmental protection rules had a positive effect on environmental accounting for sustainable development	0.516	4.577	Confirmed
Financial, information and official barriers had a positive effect on environmental accounting for sustainable development	1.079	14.323	Confirmed
Business benefits had a positive effect on environmental accounting for sustainable development	0.079	5.080	Confirmed

*Source: Research findings

It was respectively claimed in the six hypotheses that awareness of shareholders and senior managements, business features of the companies, emphasis on obeying environmental protection rules, financial, information and official barriers, and business benefits on environmental accounting is significantly effective on developing environmental accounting for sustainable development. based on tables (4-11), the statistical analysis revealed that significant values (13.097, 4.007, 4.308, 4.577, 14.323, and 5.080) were the paths among two variables larger than 1.96. therefore, this hypothesis is confirmed. Since the recorded number was positive, so this impact is direct.

Fourth topic: Conclusion and suggestions

Companies have a significant role in economic, environmental, and social comfort. The companies' activities are greatly effective in long-term sustainability of the economy and society. Shown in the outcomes applying natural representing practical advancement might be subject to different variables. Some of the most important factors are as follows: The managers' point of view on benefits and values of implementing environmental accounting, business scale, awareness of senior manager about uncertainly, and changing environment. Our findings are

similar to Naemeka *et al.*, (2017). According to the present study, some suggestions can be provided as follows:

- Environmental accounting for sustainable development needs to carry out the control to diminish energy expenses and use energy most productively. Energy reviews with city spending plans or public-private associations can work with the execution of this arrangement.
- In occupation, the public authority should absolve charge for money produced from proficient and energy-effective exercises.
- The necessity of issuing an accounting system that clarifies the benefits, costs and sources of environmental wealth.

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