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Challenges Disclosure of Environmental Accounting Performance and its Impact on Supply Chains and Sustainable Development of Companies-Experiences of Some Companies in the (GCC) Countries-2024

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Abstract: In response to the growing environmental concerns and sustainability imperatives in the (GCC) and the world in general, companies are increasingly being urged to integrate environmental accountability into their core strategies and operations by accounting for environmental performance in their financial statements and the impact on supply chains and sustainable development. The problem of the study is to identify the impact of environmental accounting disclosure challenges on supply chains and sustainable development in companies. By taking the experiments of 20 companies and representatives of the study community interested in the topic, and using the heuristic research approach through the questionnaire tool and a set of key variables, including the adoption of disclosure on environmental accounting performance (DEAP), supply chain sustainability performance(SP), Sustainable Development Index(SD), and using the (PLS) program, in the statistical analysis, the study reached the most important results: The study revealed a positive relationship between the disclosure of environmental accounting performance, improved supply chains and sustainable development in the companies represented by the study sample in the (GCC), where both financial performance and environmental performance contribute to achieving the Sustainable Development Goals and supply chains. Accordingly, the study recommends many recommendations, the most important of which are: the need for companies to be encouraged to disclose the performance of environmental accounting as a strategic necessity, promote more sustainable supply chain management, improve financial performance, and effectively contribute to achieving the Sustainable Development Goals, thereby enhancing sustainability within companies and across supply chains, the study also recommends the need to continue studies in this aspect, especially in the (GCC) and East Asian countries, to urge companies to disclose the performance of environmental accounting in their financial statements.

Keywords: challenges of disclosing; environmental accounting; environmental performance; financial performance; supply chains; sustainable development; GCC countries

1. Introduction

Environmental accounting can be traced back to the late 20th century when environmental issues gained prominence on the global agenda [1]It is essentially an extension of traditional financial accounting, focusing on the measurement, quantification, and reporting of environmental impacts associated with a company's activities [2]. Environmental accounting allows for a structured assessment of the environmental costs and benefits of various operations, products, and processes. This integration of environmental considerations into financial and managerial decision-making processes is pivotal in enabling companies to make informed choices that align with sustainability objectives, environmental accounting is a cornerstone of the Supply Chain and sustainability journey, as it provides a structured framework for assessing and managing the environmental aspects of business operations [3]. this approach extends beyond merely quantifying environmental costs and

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benefits; it informs companies on how to minimize negative environmental impacts and optimize positive ones [4].

Environmental accounting also plays a pivotal role in influencing supply chains, as the supply chain concept is becoming more complex than ever in the struggle to meet the globalization of the supply base and the diversification of products to meet the change in customer needs and expectations [5]. The supply chain is currently a competitive arena for businesses both domestically and internationally, which has forced businesses to rely on supply strategies as the cornerstone of strategic supply management [6]. companies face challenges when trying to implement supply chain management. These challenges stem from the complexity of the supply chain, the unpredictability of the corporate product market, the absence of coordination and cooperation between various stakeholders to ensure effective communication, risk management in connection with price hikes and policy changes, and the lack of human resource capabilities that companies have in terms of technological competence [7]. The claim is that enterprises face uncertainty in the production process because market demand undergoes sudden changes and the demand for products depends on certain events [8].

In a rapidly evolving global landscape, characterized by increasing environmental concerns, businesses are facing a pressing need to integrate sustainability into their core strategies and operations [9]. This imperative arises from the recognition that the traditional approach to business, which often prioritized short-term economic gains without accounting for the long-term environmental consequences, is no longer tenable. Climate change, resource scarcity, and other ecological challenges demand that companies adopt a more responsible and sustainable approach to their activities [10], The companies have predominantly focused on economic growth and profit maximization as primary objectives, often overlooking or underestimating the long-term environmental costs associated with their operations. However, the last few decades have witnessed a significant shift in this paradigm. Sustainability has emerged as a critical consideration for businesses across sectors, and environmental responsibility has become a defining feature of corporate behavior [11]

Several key factors have driven this transformation in the business-sustainability landscape. Regulatory Pressure: Governments and international bodies have recognized the urgency of environmental issues and have introduced a slew of regulations to curb emissions, manage waste, and encourage responsible environmental practices [12]. Non-compliance with these regulations can lead to legal and financial consequences for companies. Consumer Awareness and Expectations: Today's consumers are more informed and environmentally conscious [13], They increasingly expect the brands and products they engage with to be environmentally responsible. Companies that fail to meet these expectations may face reputational damage and loss of market share [14]. Investor and Shareholder Influence: Institutional investors and shareholders are also playing a pivotal role in driving sustainability initiatives within companies [15] Sustainable practices that reduce resource consumption are seen as a way to mitigate these risks. Climate Change Concerns: The increasing urgency of climate change, manifested through more frequent and severe weather events, has underlined the significance of greenhouse gas emissions [16]. Businesses are facing mounting pressure to reduce their carbon footprint.

In response to these converging forces, companies are embracing sustainability as a strategic imperative, seeking to harmonize economic growth with environmental and social well-being [17]. This approach extends beyond merely quantifying environmental costs and benefits; it informs companies on how to minimize negative environmental impacts and optimize positive ones [4].

Environmental accounting informs product design and material selection by highlighting the environmental impacts of different choices [18]. It encourages companies to develop eco-friendly products and choose materials with lower environmental footprints, contributing to the reduction of overall environmental impact.

Through accounting for environmental performance, companies can identify areas where waste can be minimized, resource consumption reduced, and processes made more efficient [19]. Cost reduction and improved efficiency often go hand-in-hand with sustainability efforts.

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Environmental accounting is not just a reporting tool; it is an essential aspect of responsible business practice that influences supply chain decisions and fosters sustainable development [20]. Its significance can be viewed through several lenses. Quantification of Environmental Costs and Benefits: At its core, environmental accounting enables the systematic measurement and quantification of the environmental impacts associated with business operations [21]. Environmental accounting provides insights into areas where businesses can reduce their environmental footprint, A traditional accounting system does not provide a specific view of environmental impacts and their related costs but focuses instead on financial performance [22]. By examining the data generated through environmental accounting, companies can identify inefficiencies, areas for improvement, and resource optimization opportunities.

The problem of this study was to identify the challenges of disclosing environmental performance accounting and its impact on supply chains and sustainable development in companies in the GCC, through the research question: What is the impact of disclosing environmental performance accounting on supply chains and sustainable development? To identify the research gap in this study, the authors referred to some previous studies on the subject of the study as follows:

The researchers ortas, E., M. Moneva. believe that this study contributes to the discussions of supply chain management, environmental practices, and drivers of the environmental and financial success of companies, as their study aimed to investigate the relationship between sustainable supply chain and the financial performance of companies [23], the researchers Jui-Che Tu and Hsieh-Shan Huang also see in their study, the European countries, the U.S., Japan, the UN, and Taiwan have successively promoted environmental accounting guidelines and required enterprises to disclose environmental improvement information, to improve the environment through production that will unavoidably impact product manufacturing [24], As a study indicated by Suaad Jassem, Anna Azmi, and Zarina Zakaria the process of making an investment decision based on aspects of sustainability is gaining importance among organizations around the world. In this context, there is a need to make good investment decisions, which require sufficient knowledge among managers of organizations about sustainability management information to achieve environmental goals that meet the expectations of stakeholders [25], In the study of researchers Thi Tam Lo, Thi Mai Anh Nguyen, and Thi Thu Hin van they see that construction materials manufacturing enterprises in Vietnam with medium and large scales, which is considered one of the industries that cause significant negative impacts on the environment, and therefore environmental efficiency can positively affect financial efficiency, so innovative solutions to reduce environmental pollution can enhance the profitability of enterprises [22], The study Panagiotis travels, Georgios malindritos and Panagiotis rekletis aims to explore the relationship between green supply chain management practices and three different performance aspects, namely supply chain, green (environmental) and business performance, and environmental dynamic control [26], In A study conducted by researchers (Mohammed Shoaib, Aamer Aslam, and Anam Aslam), This research also highlighted that environmental accounting disclosure practices have a positive impact on the company's performance and that these disclosure practices are highly dependent on company characteristics such as company size, profitability, listing time, leverage, board size and ag company [27], The researchers ' study also explored Maoli Ji, Yuguang Ji, and Shulan Dong factors that drive environmental accounting information disclosure (EAID) among corporations in China, and nvironmental accounting information disclosure and provides important insights for Chinese regulators into effective ways of fostering disclosures of environmental accounting information and raising corporate awareness of CSR fulfilment to ensure sustainable development [28], The study Agus Joko Pramono, suarno, Firdaus amiar, and Rene Fresca, also aims to implement the Sustainable Development Goals in the manufacturing sector in Indonesia , through the relationship between sustainability management accounting and environmental management systems to determine if these two variables can improve organizational performance in the Indonesian manufacturing sector [29], In a recent study, the researchers studied Suhaib, Seyyed Amir Babak Rasmi, and Metin Türkay, Their monograph titled (Sustainability analysis of cement supply chains considering economic, environmental and social effects) Effects Integration of sustainability indicators in cement supply chains in the framework of triangular

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accounting Sustainability using multi-objective optimization [30]. The study of Jennifer Davies et all, explores and discusses how NFTs, analyzed through the lens of the Technology Organisation Environment (TOE) framework, can drive supply chain sustainability and overcome the barriers to Blockchain Technology (BCT) adoption [31].

The authors believe that this study is looking towards covering the research gap in the GCC countries by identifying the challenges of disclosing environmental accounting performance and its impact on supply chains and sustainable development in companies.

This study is structured to delve deeper into the impact of environmental accounting on supply chains and sustainable development in companies in the GCC countries. The Literature Review section will offer an in-depth examination of the existing body of knowledge on environmental accounting, its methodologies, and its influence on supply chains and sustainable development. The Data and Method section will elucidate the research methods employed to investigate the impact of environmental accounting [32]. It will describe the data sources, research approach, and methodologies used in the research process. The Results and Discussion section will present the findings of the research, showcasing how environmental accounting influences supply chains and contributes to sustainable development. It will explore real-world examples and case studies to illustrate the practical applications of environmental accounting [15]. The Conclusion will synthesize the key findings and their implications for businesses and sustainability practitioners. It will underscore the significance of environmental accounting as a tool for promoting sustainability within companies and across supply chains [33].

In short, this study is a comprehensive exploration to identify the impact of environmental accounting disclosure challenges on supply chains and promoting sustainable development in companies in the GCC countries. As the business world adapts to the imperatives of sustainability and the urgent need to address environmental challenges, environmental accounting stands as a cornerstone in this transformative journey [34]. By integrating environmental considerations into financial and managerial decision-making, companies can make informed choices, reduce their environmental footprint, enhance their reputation, and contribute to global efforts to mitigate environmental challenges and promote sustainable development.

2. Background of GCC Countries

The Gulf Cooperation Council (GCC) comprises six nations: Kuwait, Qatar, the Sultanate of Oman, the United Arab Emirates, Bahrain, and the Kingdom of Saudi Arabia. Member states share common characteristics such as Arab ethnicity, Islam, monarchy, culture, and traditions [35].GCC member countries have high GDP per capita due to their abundant oil and gas deposits [36]. Assad and Alshurideh (2020) and Callen et al. (2014) report that the region's economy rapidly develops due to increased oil and natural gas income and a construction and investment boom. Regional oil and natural gas output and growing worldwide prices have led to significant public and private investment over the last two decades [37]. Global events, including the Dubai World Expo 2020 in the UAE and the FIFA World Cup 2022 in Qatar, have led to significant expenditures. Saudi Arabia's Vision 2030 highlights the significant investments made by the GCC economies. Over the past two decades, oil-rich nations' financial markets have rapidly expanded, attracting domestic, regional, and foreign direct investments [38]. This study explained the challenges related to the disclosure of industrial companies in the GCC on the accounting of environmental performance and its impact on supply chains and the sustainable development of companies [39].

3. Letter Review and Hypothesis Development

3.1. Development of the First Hypothesis: Disclosure of Environmental Accounting Performance (DEAP), and Supply Chain Performance (SCP)

To develop this hypothesis, the authors will discuss the independent variable disclosure of environmental accounting performance, which deals with financial performance and environmental

 doi:10.20944/preprints202410.0800.v1

performance, and the extent of its impact on the dependent variable, which is supply chains, as follows:

3.1.1. Disclosure of Financial Performance (DFP)

Financial performance disclosure is a fundamental aspect of corporate governance, providing stakeholders with insights into a company's profitability, liquidity, solvency, and overall financial health [40] . By transparently reporting financial results, companies demonstrate their commitment to accountability and integrity, thereby building trust among stakeholders and fostering investor confidence [41].Transparent disclosure of financial performance instills confidence in investors by providing them with accurate and reliable information to make informed investment decisions [42], disclosure of financial performance allows companies to maintain positive relations with creditors by demonstrating their ability to fulfill debt obligations and effectively manage financial risks [43]compliance with regulatory requirements for financial reporting ensures that companies comply with accounting standards and governance principles, enhance credibility, and avoid legal sanctions [44]. finally, public disclosure of financial performance affects market perceptions of the company's value, growth potential, and competitiveness, which affects stock prices and market sentiment [45].

3.1.2. Challenges of Financial Performance Disclosure

The complexity of Financial Reporting Standards and systems can make it difficult for companies to ensure compliance and provide clear and concise disclosures [46], some financial metrics, such as fair value measurements and impairment assessments, include subjective judgments and estimates, which leads to possible discrepancies in reported results [47]. companies are reluctant to disclose certain sensitive financial information, such as ownership statements or strategic plans, due to competitive concerns or speculative risks in the market, ensuring the accuracy and reliability of financial statements requires strong internal controls, data validation, and independent audits, which can be resource-intensive and time-consuming [48].

3.1.3. Disclosure of Environmental Performance (DEP)

Environmental Performance Disclosure has gained prominence in response to growing concerns about climate change, resource depletion, and environmental degradation. This makes companies increasingly aware of the importance of transparency and accountability in managing their environment. [49].One of the benefits of disclosure is that transparent disclosure of environmental performance allows stakeholders to accurately assess the company's environmental impacts, risks, and mitigation efforts, disclosure of environmental performance also promotes dialogue and cooperation with stakeholders, including investors, customers, employees, regulatory bodies and communities, thereby enhancing trust and building positive relationships [50], as well as comprehensive reporting allows companies to proactively identify and address environmental risks, reduce potential liabilities, regulatory non-compliance, and damage to reputation, and also benefits companies that demonstrate strong environmental performance and sustainability commitments can gain a competitive advantage by attracting investors and customers And environmentally conscious talents [32].

3.1.4. Challenges of Disclosure Environmental Performance

Perhaps the most prominent of these challenges is the collection of accurate and reliable environmental data, which may be difficult due to the complexity of environmental impacts, measurement methodologies, and data sources. [10]Compliance with various environmental reporting standards and frameworks, such as the Global Reporting Initiative, the Committee for Development Policy, and the Supreme Council for Standardization and Metrology, requires companies to navigate a complex landscape of reporting requirements and guidelines. The identification of physical and stakeholder-related environmental metrics indicators and business processes requires careful consideration and stakeholder participation [31].

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3.1.5. Supply Chain Performance (SCP)

The concept of supply chain refers to the degree to which the supply chain meets or exceeds the expectations and requirements of customers and regulatory bodies. They include various aspects of the supply chain, including the quality of products or services, processes, relationships, and overall performance. [51] The concept of supply chain also refers to a well-organized network of interconnected entities and processes that effectively cooperate to provide goods or services to customers while meeting or exceeding their expectations.

The quality of the products or services provided by the supply chain. It involves meeting specifications, standards, and customer expectations regarding features, performance, durability, reliability, and safety. [52]. Process quality also focuses on the effectiveness, efficiency, and consistency of processes and processes within the supply chain, as it includes the use of best practices, quality management techniques, and continuous improvement methodologies to improve processes, reduce waste, and enhance productivity [20]. Supplier quality refers to the quality of materials, components, and services provided by suppliers to the supply chain, and includes the selection and management of suppliers based on their ability to meet quality standards, deliver on time, and maintain consistent performance. as the quality of the relationship, It's about strength, trust, and cooperation between supply chain partners, including suppliers, manufacturers, distributors, and customers [53]. As for performance, it measures the overall performance of the supply chain in terms of key performance indicators such as delivery lead times, inventory turnover, order fulfillment rates, customer satisfaction, and financial performance. It involves monitoring, measuring, and optimizing performance to achieve the desired results and goals [21]. In the aspect of regulatory compliance and performance, the supply chain operates by legal and regulatory requirements, industry standards, and ethical principles, including adherence to quality standards, safety regulations, environmental policies, and ethical guidelines to mitigate risks, protect stakeholders, and preserve reputation [54]. the issue of continuous improvement is a key aspect of supply chain quality, including continuous efforts to identify, analyze, and address areas for improvement. It includes the implementation of corrective actions, preventive measures, and innovation initiatives to enhance quality, efficiency, and competitiveness [55]. Supply chain contributes to sustainable development by promoting economic growth, social equity, and environmental conservation [56]. Efficient supply chains minimize waste, reduce costs, and enhance product quality, leading to increased competitiveness and profitability for companies.

Overall, the concept of supply chain emphasizes the importance of delivering high products or services, optimizing processes, building strong relationships, achieving performance goals, ensuring compliance, and continuously improving performance to meet the evolving needs and expectations of customers [31].

3.1.6. Disclosure of Environmental Accounting Performance (DEAP), and Supply Chain Performance (SCP)

Disclosure of Environmental Accounting Performance affects the supply chain by influencing sourcing decisions, production processes, and distribution channels. Companies with strong environmental performance standards are likelier to partner with suppliers and vendors who prioritize sustainability [57], leading to a higher quality and more resilient supply chain. Additionally, environmentally conscious practices such as resource efficiency, waste reduction, and product innovation can enhance supply chain operations' overall efficiency and effectiveness [58].

Based on the above discussion about the disclosure of the performance of the accounting environment and the extent of its impact on supply chains, and through the challenges facing companies about this, the authors developed this hypothesis:

H$_1$: There is a statistically significant relationship between the disclosure of environmental accounting performance (DEAP) and, the supply chain performance (SCP) of the company.

3.2. Development of the second hypothesis: Disclosure of Environmental Accounting Performance (DEAP), and Sustainable Development (SD).

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To develop this hypothesis, the authors will address the independent variable disclosure of environmental accounting performance, which addresses financial performance, environmental performance, and the extent to which it affects the dependent variable, which is sustainable development, as follows: The Independent was discussed in the first hypothesis so the authors will directly address the dependent variable as follows:

3.2.1. Sustainable development (SD)

The term sustainable development is often referred to as the long-term preservation of prosperity for future generations, contingent upon the responsible utilization of natural resources [59]. Sustainable development embodies a business practice that embodies the concept of satisfying economic and environmental demands for the betterment of the broader community [60]. The term sustainable development is often referred to as the long-term preservation of prosperity for future generations, contingent upon the responsible utilization of natural resources [15]. It was defined by the World Commission for Sustainable Development in in1987 as: "meeting the needs of the present without destroying the ability of future generations to meet their own needs [56]". The United Nations Conference on Environment and Development (Rio de Janeiro, 1992) defined it as:" managing economic resources in a way that preserves or improves resources and the environment to enable future generations to live a better decent life [49]. The concept of sustainable development has become a reference for scientific research on the environment and has acquired a paradigm character for development since its appearance in the Brundtland Report in 1987, Since the Rio de Janeiro Earth Summit, the concept has become hegemonic and has been incorporated in international treaties and the national constitutions and laws of many countries around the world [61] It has also been used in issues related to business, the agricultural production industry, and urban development and has become the conceptual foundation of theoretical approaches like green [62]., and circular economy. It has become a part of the common sense of a large proportion of the world's population and environmental defense political slogans [60]. Moreover, sustainable supply chain practices, such as ethical sourcing, fair labor practices, and community engagement, contribute to social well-being and stakeholder trust. By integrating sustainability principles into supply chain management, companies can achieve long-term viability while minimizing their environmental footprint [52].

3.2.2. Disclosure of Environmental Accounting Performance (DEAP), and Sustainable Development (SD)

Sustainability has been widely accepted since the olden days, especially in rural societies. The world’s ancient cultures combine worship and religious convictions with environmental preservation, which calls on people to take care of the planet and keep it in good condition; this may be considered a demonstration of sustainability in the ancient ages [63], sustainability and its policy corollary, sustainable development, have inspired intense scholarly [15]. The link between environmental accounting performance and sustainable development lies in the pursuit of environmental conservation and resource stewardship to support long-term prosperity and well-being. By improving environmental accounting performance, organizations contribute to the broader goal of sustainable development by minimizing negative environmental impacts, conserving natural resources, and promoting resilience to environmental changes [64].

Based on the above discussion on the disclosure of the performance of the accounting environment and its impact on Sustainable Development, and through the challenges facing companies on this topic , the authors have developed this hypothesis:

H_2 There is a statistically significant relationship between the disclosure of environmental accounting performance (DEAP) and, sustainable development (SD) in the company.

To determine the extent to which the independent variable affects the dependent variable this model was developed, according to which:

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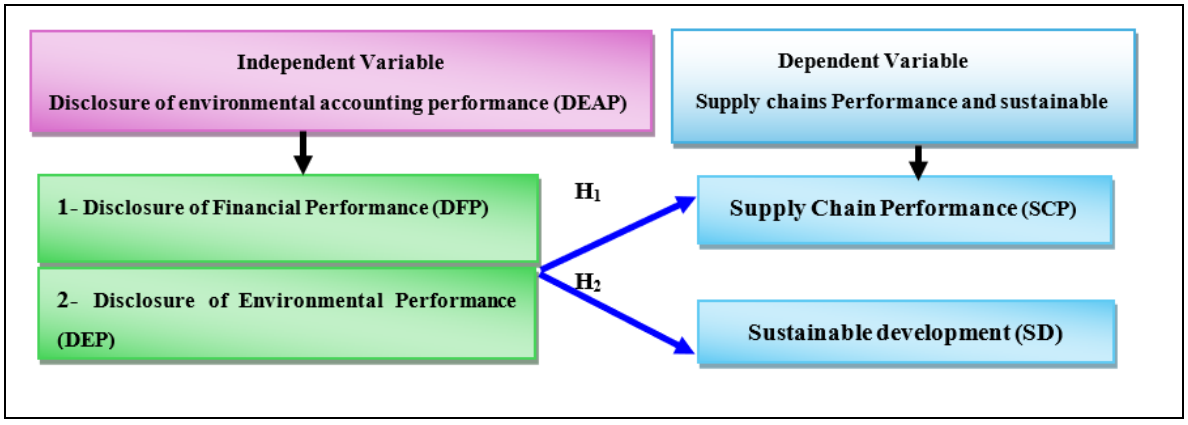

Figure 1. Research Model.

This model is designed after a thorough review of the theoretical literature on the subject of research, in which an adequate definition and explanation of both independent and dependent variables will be presented. The mechanisms of correlation between independent and dependent variables will also be clarified, relying on the theoretical literature and the results of the field.

4 Methods

The questionnaire was used to survey (20) companies and factories most interested in revealing the performance of environmental accounting and its impact on supply chains and sustainable development in the GCC, as these companies represent the study community realistically, and the number of usable questionnaires reached (200), resulting in a response rate of 90%.

4.1 Analysis of Data

The data was analyzed using the partial least squares program (PLS), to find out the challenges of detecting the performance of environmental accounting and its impact on supply chains and the sustainable development of industrial companies in the GCC countries.

4.2 Demographic Information Analysis

Table 1 explains the analysis of the demographic information of the sample.

Table 1. Demographic information analysis.

Demographic	Elements	Frequency	%
qualification	Doctorate	25	12.5%
	Master's	50	25%
	Bachelor's degree	125	62.5%
	Total	**200**	**100%**
Specialization	Management	80	40%
	Accounting	22	11%
	Economic	42	21%
	Other	56	28%
	Total	**200**	**100%**
Experience	Less than 5 years	30	15%
	From 5 and less than 10 years	60	30%
	From 10 and less than 15 years	49	24.5%
	From 15 years and less than 20 years	31	15.5%

 doi:10.20944/preprints202410.0800.v1

	From 20 years and over	30	15%
	Total	**200**	**100%**
Position	Director	20	10%
	Managing director	60	30%
	Staff	120	60%
	Total	**200**	**100%**

4.3 The Outer Loading Test& Collinearity Statistics (VIF) of the Model

Table 2 shows the final path of loading the results of the proposed model of study variables (DFP, DEP, SCP, SD), From Table 2 the outer loadings represent the strength of the relationship between each indication (survey question) and the underlying, outer loadings greater than 0.70, were considered adequately significant in the suggested model [65].

The VIF values for all variables in this dataset are significantly lower than the frequently accepted threshold of 5, suggesting that multicollinearity is not a significant issue.

The maximum observed VIF value is 2.918 for (DEP4), which is far below the threshold, indicating that the indicators in the model exhibit a rather high level of independence. The measurement model demonstrates the absence of collinearity concerns, as seen by the lowest VIF score of 2.114 for (SD4).

Table 2. The Outer loading test& Collinearity Statistics (VIF) of the model.

Variables	**Item**	**Outer Loading**	**Vif**
Disclosure of Financial Performance (DFP).	DFP1	0.841	2.135
	DFP2	0.846	2.409
	DFP3	0.873	2.411
	DFP4	0.832	2.189
Disclosure of Environmental Performance (DEP).	DEP1	0.816	2.513
	DEP2	0.856	2.905
	DEP3	0.871	2.515
	DEP4	0.823	2.918
Supply Chain Performance (SCP)	SCP1	0.818	2.315
	SCP2	0.858	2.590
	SCP3	0.826	2.141
	SCP4	0.838	2.891
Sustainable development (SD)	SD1	0.817	2.290
	SD2	0.849	2.370
	SD3	0.837	2.287
	SD4	0.843	2.114

4.4. The Reliability and Validity Test of the Model

Table 3 shows the reliability (Cronbach's alpha, Composite reliability (rho_a), and (rho_c)) and validity average variance extracted (AVE), showing that construct reliability can be accepted if Cronbach's alpha value is greater than 0.70 [65] Furthermore, accept convergent validity if the Composite reliability (rho_a) and (rho_c) is greater than 0.70 [65], and the AVE analyses are greater than 0.50. As a result, every item passes the reliability and validity tests.

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Table 3. The reliability and validity test of the model.

Variables	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Disclosure of Financial Performance (DFP).	0.885	0.877	0.913	0.785
Disclosure of Environmental Performance (DEP).	0.912	0.916	0.901	0.748
Supply Chain Performance (SCP).	0.881	0.879	0.910	0.790
Sustainable development (SD).	0.901	0.920	0.906	0.723

4.5. R-Squared Value

Table 4 shows the outcomes of the path quantity method for the proposed model using the R-squared value. The reliability of the R-squared assessment for the variable Disclosure of environmental accounting performance (DEAP) on the effects of Supply chain Performance and sustainable development (SCSD) is 0.860, according to Table 4. As a result, if the R-squared value is greater than 0.25, the suggested model's predictive validity is based on the orientation [65].

Table 4. R-squared value.

Factor	R-square
Challenges Disclosure of Environmental Accounting Performance and its Impact on Supply Chains and Sustainable Development of Companies -Experiences of Some Companies in the (GCC) Countries -2024	0.860

4.6. Hypotheses Testing.

The results obtained from the PLS-SEM analysis have the data in Table 5 indicates a positive relationship between the Disclosure of environmental accounting performance and supply chains and the sustainable development in Companies, this is as follows:

H_1 Disclosure of environmental accounting performance (DEAP)-> Supply Chain Performance (SCP), Original sample (O) = 0.198, Sample mean (M) = 0.196, Standard deviation (STDEV) = 0.051, T statistics (O/STDEV) = 3.861, P values = 0.000.

H_2 Disclosure of environmental accounting performance (DEAP)-> Sustainable development (SD), Original sample (O) = 0.195, Sample mean (M) = 0.191, Standard deviation (STDEV) = 0.050, T statistics (O/STDEV) = 3.822, P values = 0.000.

Table 5. Hypotheses Testing.

Variables	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values

 doi:10.20944/preprints202410.0800.v1

Ethical values of disclosure of environmental accounting performance (DEAP)-> Supply Chain Performance (SCP)	0.198	0.196	0.051	3.861	0.000
Ethical values of disclosure of environmental accounting performance (DEAP) -> Sustainable development (SD)	0.195	0.191	0.050	3.822	0.000

4.7. Bootstrapping Analysis

Figure 2 shows the T-value of the proposed model of the bootstrap program with partial least squares 3.3.3 (pls 3.3.3) it was used to evaluate the (H_1) of the study, the result of the T-value test of the Ethical values of Disclosure of environmental accounting performance (DEAP) variable test, in Supply chain Performance (SCP).

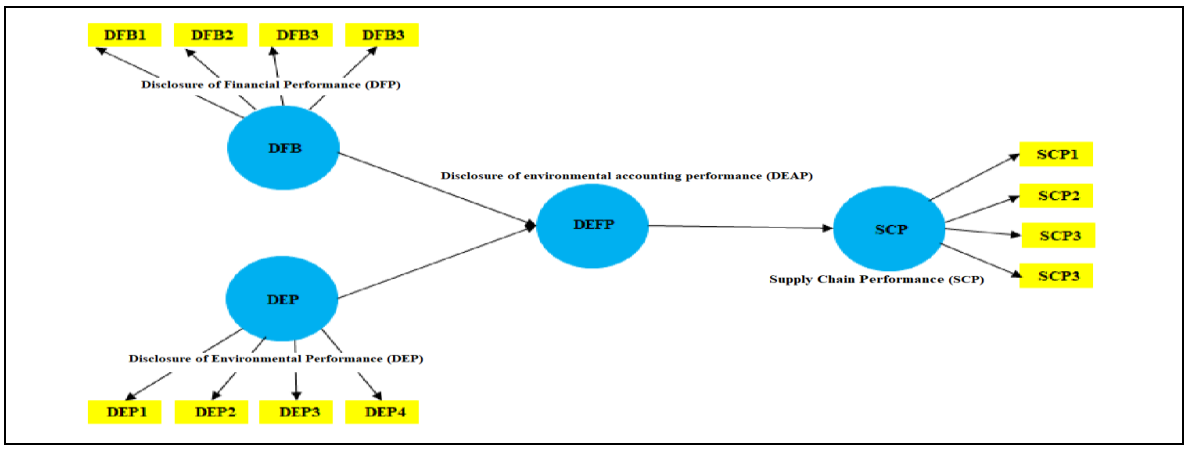

Figure 2. Bootstrapping Analysis – **H_1**.

Figure 3 shows the T-value of the proposed model of the bootstrap program with partial least squares 3.3.3 (pls 3.3.3) it was used to evaluate the (H_2) of the study, the result of the T-value test of the Ethical values of Disclosure of environmental accounting performance (DEAP) variable test, in sustainable development (SD).

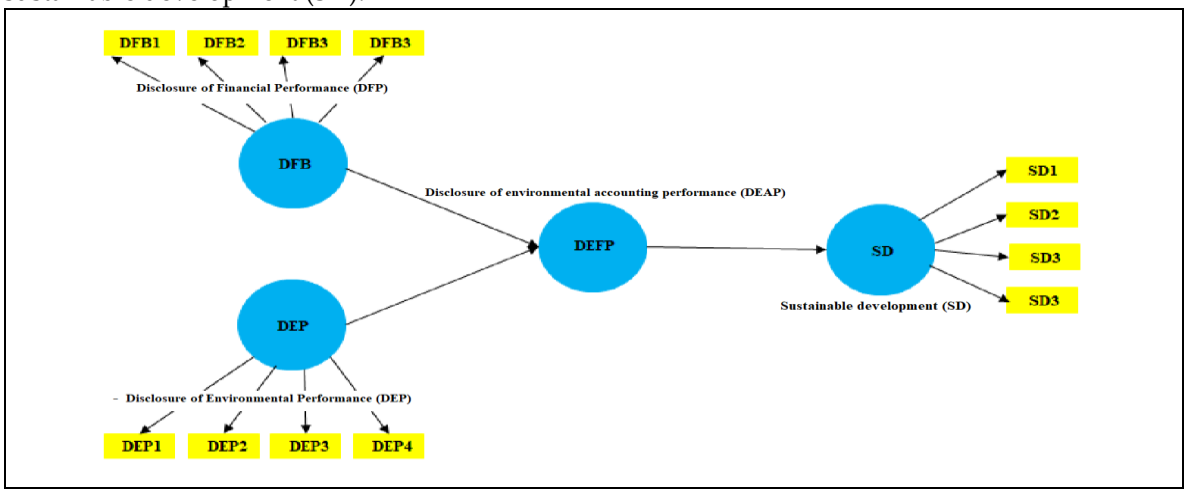

Figure 3. Bootstrapping Analysis - **H_2**.

5. Discussions and Results

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The main objective of the study is to study the challenges related to accounting disclosure of environmental performance and its impact on the performance of supply chains and sustainable development of companies in the GCC countries, by addressing the intake of the most interested companies and factories, the study reached the following results:

The study model of PLs analysis with all dependent variables (DEAP) and independent variables (SCP, CD) showed the values of the Outer loading test and the statistics of the nested linear relationship above 0.70.

The results of the study of hypothesis (H1) testing showed a correlation between the disclosure of environmental accounting performance (DEAP) and the supply chain performance (SCP), according to the values original sample (O) = 0.198, Sample mean (M) = 0.196, Standard deviation (STDEV) = 0.051, T statistics (O/STDEV) = 3.861, P values = 0.000.

The results of the study showed that all the figures of the variable (DFP, SCP) with Outer loading test and the statistics of the nested linear relationship above 0.70. The results of the variable (DFP1, SCP1) confirmed that the Disclosure of financial performance by companies helps the variable performance of supply chains. The results of the variable (DFP2, SCP2) showed the identification of strengths and weaknesses in the disclosure of financial performance leads to the continuous improvement of the company's variable supply chain performance. The results of the variable (DFP3, SCP3) confirmed company regularly evaluates the disclosure of financial performance to raise the variable performance of supply chains. The results of the variable (DFP4, SCP4) showed that Disclosure of financial performance is an important tool for making financial decisions to achieve the variable performance of the company's supply chains. Our study in this aspect is consistent with what is stated in the studies [27,45,46,51,52].

The results of the study showed that all the figures of the variable (DEP, SCP) with Outer loading test and the statistics of the nested linear relationship above 0.70. The results of the variables (DEP1, SCP1) The Environmental Performance model of the company helps achieve better performance of supply chains, as confirmed by the results through variables (DEP2, SCP2) That the company separates environmental costs from economic costs to increase the efficiency of supply chain management. The results also showed through variables (DEP3, SCP3) The company is interested in educating those interested in environmental accounting to achieve better performance of supply chains. The results also confirmed the variables (DEP4, SCP4), which is that the company's top management encourages the development of green supply chain performance. Our study in this aspect is consistent with what is stated in the studies. [10,20,32,49,50,54] It also varies with studies [27–29].

The results of the study of hypothesis (H2) testing showed a correlation between disclosure of environmental accounting performance (DEAP) and Sustainable development (SD), according to the values original sample (O) = 0.195, Sample mean (M) = 0.191, Standard deviation (STDEV) = 0.050, T statistics (O/STDEV) = 3.822, P values = 0.000.

The results of the study showed that all the figures for the variable (DFP, SD) with the Outer loading test and the statistics of the nested linear relationship were above 0.70. The results of the variable (DFP1, SD1) That companies disclose environmental performance practices in the financial statements to the variable achieve sustainable development. As The results showed the variable (DFP2, SD2) is related there is the impact of measuring the financial performance of the company in the variable achieving sustainable development. The results of the variable (DFP3, SD3) Measuring the financial performance of environmental costs reduces damage to the environment and the variable achieves sustainable development. The results for the variable (DFP4, SD4), state that the financial performance of companies is influenced by their practices toward variable sustainable development. This is indicated by some studies such as [45,46,59], [15,49,60].

The results of the study showed that all the figures of the variable (DEP, SD) with Outer loading test and the statistics of the nested linear relationship above 0.70. The results were confirmed by variables (DEP1, SD1) The environmental performance of the company is monitored to achieve the Sustainable Development Goals. The results are also shown for variables (DEP2, SD2) The accounting disclosure of environmental performance is a mechanism for judging the company's performance

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and achieving sustainable development. The results were also confirmed by variables (DEP3, SD3) The environmental performance of companies is improved by paying attention to sustainable development. Finally, the results were shown for the variables (DEP4, SD4) That companies suffer from a lack of concepts of the environmental dimension, which affects sustainable development. Our study in this aspect is consistent with the studies [32,49,50], [10,63,64].

6. Recommendations

Based on the applied study procedures and the theoretical literature and previous studies, the study made the following recommendations:

Our study underscores the critical role of environmental accounting adoption in driving sustainable development and enhancing supply chain sustainability within companies. By examining a comprehensive set of variables, including disclosure of financial performance(DFP), Disclosure of Environmental Performance(DEP), supply chain performance (SCP), and Sustainable development (SD), we have contributed to a holistic understanding of sustainability in the business context of the GCC countries.

Our findings are consistent with previous research, with which we agree that environmental accounting practices provide a path to achieving environmental and financial goals. Such practices not only improve environmental performance but also contribute to the development of sustainable supply chains. Moreover, our research highlights the competitive advantage of large companies in the GCC countries achieving supply chain sustainability, reflecting the importance of economies of scale. This is indicated by the following studies [26–31]

As companies continue In the GCC countries, specifically Saudi Arabia to face mounting pressure to address environmental and social responsibilities, our research provides valuable insights. It underscores the business case for environmental accounting practices, showcasing how they can drive sustainable development and foster sustainable supply chains. This not only benefits the companies themselves by enhancing their financial and environmental performance but also contributes to the broader societal goal of achieving sustainability, That's according to a study [23–25,31]

To remain competitive and fulfill their corporate social responsibility, companies must consider the adoption of environmental accounting practices as an integral component of their sustainability strategies. As the sustainability landscape evolves, embracing these practices will be crucial for companies seeking to navigate the complex terrain of environmental responsibility and economic viability.

Our research serves as a testament to the potential benefits of this approach, highlighting how it can catalyze sustainable development, the cultivation of sustainable supply chains, and, ultimately, a more sustainable future, Not only in the GCC countries but also the generalization of this to all countries of the world.

Our study also recommends that researchers in this field cover the research gap, There should be studies that focus on identifying the challenges facing companies when disclosing financial and environmental performance and its impact on supply chains and sustainable development in companies operating in the entire GCC, North African countries, and companies operating in East Asia, where studies are still needed, although there are few of them. So are Europe, Australia, and the Americas.

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