A proposed Framework for the effects of professional assurance of reporting climate change on stock prices (An applied study)

An extract from PhD thesis in accounting titled

A proposed Framework for measuring the disclosure and professional assurance about climate change and its impact on Firm Value (An applied study)

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Abstract

This research deals with presenting a proposed framework for auditor's professional assurance on firms' reporting of climate change that is appropriate for the nature of companies listed on the Egyptian Stock Exchange. Also, the main objective of this study is to investigate the effect of the auditor's professional assurance on firms' reporting of climate change on stock price. This research depends upon the two basic approaches in the research methodology: the inductive approach and the deductive approach. The researcher conducted an applied study was conducted on a sample of stock investors in brokerage firms and securities trading firms. These results of experimental study conclude that there is a positive impact of professional assurance on the disclosure of climate change-related information by firms listed on the Egyptian Stock Exchange on its stock price.The researcher recommends the need to activate the role of auditors in ensuring the reporting of climate change information, which will assist stakeholders in making decisions related to these companies. This can be achieved by qualifying and training auditors in providing professional assurance on climate change-related reporting, and by developing their skills and professional competence to perform this service. The researcher also recommends the issuance of an Egyptian standard for the assurance of climate change information, in light of the recommendations and guidelines of local and international professional and academic organizations.

Key words: Reporting Climate Change**,** climate change risks, climate change opportunities, Professional Assurance**,** and Stock price

المستخلص

يتناول هذا البحث تقديم إطار مقترح للتأكيد المهني لمراقب الحسابات بشأن تقارير الشركات عن تغير المناخ بما يتناسب مع طبيعة الشركات المدرجة في البورصة المصرية. كما يهدف البحث بشكل رئيسي إلى دراسة تأثير التأكيد المهني لمراقب الحسابات على تقارير الشركات عن تغير المناخ على سعر السهم. يعتمد هذا البحث على منهجين أساسيين في منهجية البحث: المنهج الاستقرائي والمنهج الاستنباطى. أجرى الباحث دراسة تطبيقية على عينة من مستثمري الأسهم في شركات الوساطة وشركات تداول الأوراق المالية. خلصت نتائج الدراسة التجريبية إلى وجود تأثير إيجابي للتأكيد المهني لمراقب الحسابات على إفصاح الشركات المدرجة في البورصة المصرية عن المعلومات المتعلقة بتغير المناخ على أسعار أسهمها.يوصي الباحث بضرورة تفعيل دور مراقبى الحسابات فى التوكيد على التقرير عن معلومات تغير المناخ، مما يُساعد الجهات المعنية على اتخاذ القرارات

المتعلقة بهذه الشركات. ويمكن تحقيق ذلك من خلال تأهيل وتدريب مراقبى الحسابات على تقديم توكيد مهني بشأن التقرير عن تغير المناخ، وتطوير مهاراتهم وكفاءتهم المهنية لأداء هذه الخدمة. كما يوصي الباحث بإصدار معيار مصري للتوكيدعلى معلومات تغير المناخ، في ضوء توصيات وإرشادات الهيئات المهنية والأكاديمية المحلية والدولية.

الكلمات المفتاحية: التقرير عن التغيرات المناخية، مخاطر التغيرات المناخية، فرص التغيرات المناخية، التوكيد المهنى، سعر السهم

1. Introduction:

Financial reports are significantly impacted by climate change threats. When examining financial reports that contain non-financial data, such as sustainability, governance, social, and environmental reports, which are regarded as a component of corporate reporting, auditors ought to take climate change concerns into account. These reports also offer non-financial data that aids stakeholders in choosing which investments to make. (Kamarudi et al., 2023)

The goal of the audit process is to get a reasonable assurance from the auditor that there are no material misstatements in the financial statements as a whole. This will allow the auditor to report on whether the financial statements accurately reflect all relevant information in compliance with the relevant financial reporting framework. The external auditor may have to examine whether the financial statements accurately depict the impact of climate change on the company (that is, in light of the risks of material misstatement pertaining to amounts and disclosures that may be affected depending on the firm's actual circumstances). As a result, auditors must comprehend how risks associated with climate change relate to their obligations under applicable laws and regulations as well as professional standards. (Lombardi et al., 2021& Tian, 2022)

2. Research problem:

External assurance of climate change disclosures, which verifies the accuracy of a firm's sustainability data, can positively impact a firm's value (stock price). Studies have shown that assurance helps increase the level of climate change disclosures, which in turn enhances a firm's reputation and attractiveness to investors, ultimately leading to a higher valuation of a firm(stock price) (Astuti et al., 2023).

According to the Public Firm Accounting Oversight Board's auditing standards, the auditor must perform a risk assessment, which entails learning about the firm's environment and nature by determining its goals and strategies as well as the risks and threats that could result in a material misstatement. Climate change risks and their possible effects on the firm's financial statements are then included in this assessment. (IASSB, 2020).

In addition to affirming the auditor's confidence regarding climate changes and their financial impact on enterprises in the audit report, the CalPERS, Schroders, and DWS firms requested in 2020 that accountants highlight climate-related risks in financial reports. This follows British Petroleum's financial reports disclosing climate-related risks. (EL Soufani, 2023).

Numerous studies have examined the relationship between external assurance and firm value, with consistent findings indicating a positive relationship. For example, a study using data from Indonesia found that independent assurance and carbon emissions disclosure positively impact firm value. Another study in Nigeria showed that external assurance significantly increases the impact of carbon emissions disclosure on firm value (Issa et al., 2024).

An independent third party's expert assurance services are crucial in boosting the capital market's gain from environmental information disclosure and climate change disclosure is regarded as environmental information. These advantages could include improving a company's environmental reputation (Birkey et al., 2016), safeguarding a company's reputation (Gillet Monjarret, 2018), and boosting confidence in its environmental disclosure (Corrado et al., 2019), all of which lower agency costs and information asymmetry. Higher market value (Fazzini & Dal Masso, 2016), lower capital costs (Martínez Ferrero et al., 2017a), and increased investor willingness to invest in the company are all possible outcomes of the increased transparency and credibility of environmental information reported through environmental assurance (Cheng et al., 2014).

In the light of the above discussion, the researcher seeks to study and analyze the effect of the auditor's professional assurance on firms' reporting of climate change on stock price. So the study problem can be formulated in the following questions: Does the auditor's professional assurance on firms' reporting of climate change affect the stock price of the firm?

3. Research objective

“The main objective of this research is to study the effect of the auditor's professional assurance on firms' reporting of climate change on stock price of the companies listed on the Egyptian Stock Exchange”. With the aim of achieving the following sub-objectives:

- Identify framework for auditor's professional assurance on firms' reporting of climate change that is appropriate for the nature of companies listed on the Egyptian Stock Exchange

- The study analyze the content of assurance statements on climate change reporting to examine the extent of external assurance on climate change reporting in Egyptian listed firms and identify their impact on stock price.

4. Research importance:

The increasing interest in climate change reporting and the professional assurance of the auditor on climate change reporting has had a significant impact on accounting literature recently, as it has become one of the main issues of accounting research at the present time. Therefore, this study derives its importance from the vitality of studying the subject itself.

The Arab environment needs more studies on the effects of climate change reporting and the auditor's assurance on firms ' reporting of climate change in general and the impact on stock price in particular, especially since it has not received sufficient attention compared to foreign studies that focused on studying this topic.

This study contributes to reducing the existing research gap resulting from the inconsistency of the results of previous studies on the nature of the relationship between climate change reporting, auditor's assurance on climate change, and stock price, and then to determine the extent to which climate change reporting and auditor's assurance on companies' reporting of climate change and firm value can be used.

5. Research Hypothesis:

In light of the research problem, and striving to achieve its objective, and based on the extrapolation and analysis of relevant previous studies related to the research variables, the research hypothesis can be theoretically derived as follows, which will be empirically tested later:

H1:.Professional assurance on the reporting of information related to climate change by firms listed on the Egyptian Stock Exchange has a positive impact on its stock price.

6. Research plan

To achieve the research objective, address its problem, and within its scope, the research will proceed as follows:

6.1 concept and professional description of the professional assurance service on climate change reporting

6.2 The proposed framework of professional assurance of reporting of climate change and its impact on the stock price of the firm

6.3 Research methodology

6.4 Research results and recommendations

6.1 concept and professional description of the professional assurance service on climate change reporting

In order to improve the quality of the information and its production environment, the professional assurance service also seeks to obtain reasonable assurance regarding whether the information pertaining to the assignment area is free of material errors. Additionally, it seeks to express a conclusion regarding the results of measuring or evaluating the assignment area through a written report, according to appropriate and specified measurement criteria, where the conclusion is communicated to the intended user (IAASB , 2013).

Regarding the service of professional assurance on companies' disclosure of their environmental performance regarding climate change; the researcher can define this service in comparison to (ISAE No 3000: IAASB, 2013; Musa; 2018) as a professional certification service, carried out through an organized process of collecting and objectively evaluating sufficient evidence regarding management's claims regarding companies' environmental performance related to climate change, with the aim of the auditor expressing a neutral and positive technical conclusion regarding the credibility and fairness of those claims according to specific measurement standards, and communicating the results to stakeholders in the firm, including management itself, in the form of a written report, with the aim of improving the quality of information.

- **Regarding the motives for the demand for this service;**

The perception of credibility by stakeholders, the firm's organizational and industrial characteristics, including its size, the industry it operates in, its listing on the stock exchange, media pressure, the firm's legal environment, its culture (stakeholder-driven or shareholder-driven), and the investor protection system are the most significant external drivers of demand for assurance services, according to some (Yan et al., 2022).

Additionally, Shen et al. (2020) noted that independent, external certification of carbon emissions preserves the accuracy of their data, helps businesses to enhance internal operations, spot opportunities and risks, enhances their reputation, and gives them a major competitive edge. Additionally, it allows them to communicate their proactive approach and dedication to cutting carbon emissions to the financial markets.

Regarding the level, scope, and extent of assurance, suitable professional standards for assurance, criteria for evaluating the veracity of management's claims in the report, and the professional description of the professional assurance service on climate change disclosure in terms of service providers:

- **Regarding assurance service providers:**

According to a study (Kordecki & Grant, 2023), accounting firms—the majority of which are part of the Big Four—may offer better quality assurance services than non-accounting firms because they have more experience with testing and analytical procedures as well as methods for gathering and analyzing data about various industries and multiple account types. Accounting firms are better equipped to spot errors in CSR reports because they are subject to stringent ethical codes of conduct, disciplinary procedures to safeguard their independence, and quality control systems. Additionally, the focus on CSR disclosures involves looking at a wider range of topics with acceptable and non-standard reporting and assurance standards (Reverte, 2021).

Large accounting firms have a competitive advantage due to their strong brand, relationships with current clients, and economies of scale, according to studies (Reverte, 2021; Datt et al., 2022; Kordecki & Grant, 2023). They also have specialized departments and multidisciplinary teams that enable them to provide a more specialized and diverse service. They also have experience in financial auditing, the ability to provide comprehensive services, dependable ethics, quality control, and adherence to professional standards for auditing and assurance, as well as a commitment to independence, continuing professional education, and the use of qualified specialists when necessary. Their services are rather more expensive, though, particularly when it comes to verifying reports of greenhouse gas emissions. Others have concurred. (Reverte et al. 2020) that an accounting firm's provision of external assurance benefits the capital market, and that financial market participants' perceptions of the reliability of social and environmental data are enhanced when verified by a qualified auditor. As a result, businesses with an accounting firm's confirmation of their sustainability report will be valued higher on the market than businesses with a non-accounting firm's confirmation. As a result, the researcher in the experimental study will restrict this service to being rendered by an external auditor because of the advantages it offers the financial markets.

❖ **Regarding the level of assurance;**

Based on the data gathered on the environmental information that was given, the assurance report clearly concludes how the assurance process turned out. For practitioners adhering to ISAE 3000, the level of assurance might vary from reasonable (positive) to limited (negative), whereas practitioners adhering to AA (1000AS) have "high/medium" assurance (Reverte, 2021; Yan et al., 2022).Because of the constraints of internal control systems and the assurance process itself, "reasonable/high" assurance seeks to communicate a high level of assurance that is not absolute. A positive statement from the practitioner stating that the environmental data in the environmental report satisfies the given requirements in all material respects offers this assurance. Confidence in the environmental disclosure is increased and strengthened by the conclusion of reasonable assurance. The risks associated with "limited/medium" assurance are tolerable, although they are higher than those indicated by the "reasonable/high" conclusion. As a result, the conclusion is negative, meaning that the service provider has not discovered any evidence that the material is not given honestly or in compliance with the established standards. This indicates that the report's data does not accurately and impartially cover the overall performance. (Reverte, 2021)

According to some, information with a reasonable or high level of assurance is more trustworthy, has a positive impact on market capital, and improves shareholders' perceptions of the environmental information that companies disclose. As a result, companies with a reasonable or high level of assurance are valued higher on the market than those with a limited or medium level of assurance (Reverte, 2020; Radhouane et al., 2020).

❖ **Regarding the field of assurance**

Management's claims regarding the opportunities and hazards related to climate change are included in the assurance scope. claims made by management regarding the company's management approach, the effectiveness with which it uses its resources, its future target indicators, and the results obtained from them (IFRS S1:S2, 2023; WRI and WBCSD, 2004).

This is on top of the management's claims about the impact of environmental performance data on the financial statements, including net carbon trading revenue, environmental and social expenses and obligations, bonuses and incentives for the Board of Directors, environmental compensation and compensation for greenhouse gases, fines and compensations avoided due to adherence to work-related laws and regulations, funds allotted to implement environmental protection programs and support adherence to labor laws, fines incurred by the company due to non-compliance with environmental, social, or governance laws and regulations, and the cost of implementing clean development mechanisms. The Metwally (2022) study also showed that the quantities or information provided in the financial statements are either directly or indirectly impacted by climate-related hazards. The following categories of climate-related hazards can have an impact on the company's financial statements: (1) Physical risks: such as the possibility that the company's facilities could be damaged by extreme weather or that it will have to relocate them away from low-lying coastal areas. These physical hazards brought on by climate-related disasters, along with additional effects and hazards associated with the shift away from goods and practices that emit greenhouse gases, can lower the value of businesses' assets and cause them to deteriorate(2) Risks of the shift to a low-carbon economy, such as regulatory risks related to the modifications needed for the company's operations or the effect of the company's responsibilities on management's evaluation of the asset's decline in value or productive life (since these risks influence the company's assumptions about the asset's usefulness or life for the purposes of calculating depreciation expenses). They may also have an impact on the extent and necessity of liability provisions.

- **Regarding the scope of assurance**

The scope of the professional assurance service on the climate change report includes the proper procedures to gather adequate and relevant evidence that allows the external auditor to ascertain whether the climate change report is free from material misstatements and whether these misstatements are the result of fraud or errors, according to certain studies (ISAE 3000, ISAE, 2013; Ali et al., 2017; Musa, 2018).The procedures required to verify the validity of management's environmental assertions are determined by the scope of the service. To achieve this goal, a series of basic tests will need to be conducted, and their timing, nature, and extent will be prepared based on the results of his assessment of the risks of material misstatements, as well as the requirements of professional organizations, assurance standards, applicable laws and regulations, the terms of his assignment, and, finally, the requirements for preparing his assurance report.

According to the study by Appelbaum et al. (2022), which focused on environmental information, the evidence gathered during the financial statement audit can be utilized to confirm the environmental information revealed in the ESG report. The following are examples of this evidence: (1) ascertaining whether the management of the company has considered environmental risks and opportunities, such as climate change, and adherence to pertinent laws and regulations; (2) the effects of these environmental issues on the company, society, and industry; (3) implementing an environmental management strategy by identifying areas of the company's operations, suppliers, or markets that might be impacted by shifting consumer preferences for eco-friendly products and the shift to low-carbon economies;(4) What steps has management taken to make sure the company complies with new environmental legislation and recommendations and satisfies the requirements for disclosures about them in the company's financial statements? Additionally, the trustworthiness of the environmental data that has been disclosed can be evaluated or predicted using statistical modeling or machine learning approaches based on auditors' evaluations of the efficacy of internal control. In order to accomplish the general audit objective, which is to provide reasonable assurance of the financial statements and disclosure of environmental considerations, as well as to perform analytical procedures and objective tests to ensure the validity and completeness of environmental disclosures, the "double materiality" approach to financial auditing and environmental assurance is also being applied. Additionally, a team of environmental affairs specialists is being used to give the auditor expertise and knowledge unique to the field.

❖ **Regarding the international professional standards:**

The International Standard for Professional Assurance Services for Assurance Engagements on the Disclosure of Greenhouse Gases (ISAE 3410, 2013) and the International Standard for Assurance Engagements Other than the Review and Review of Historical Information (ISAE 3000, 2013) both serve as representatives of these standards.

Under the ISAE 3000 umbrella, this standard seeks to provide limited or reasonable assurance for the absence of major misstatement in greenhouse gas data due to fraud or error. The legislation or laws in effect in a given nation, or the firm attempting to gain the assurance, define the mandatory standards. This standard does not require companies to receive any reasonable or restricted assurance. Also, the updated International Standard on Auditing No. 720(IAS 720 ,2015) pertaining to the auditor's responsibility for other financial or non-financial information (other than the financial statements and the auditor's report thereon) is included in the firm's annual report (Datt et al ,2022).

Due to their inability to be updated to conform to international standards, the related Egyptian auditing standards deviate from these standards. This practice gap could potentially impact the anticipated advantages of implementing these standards.

This is in addition to a few technical standards about assurance assignments that have been produced by non-accounting organizations. The most significant of these is the Assurance Standard (AS1000AA), which was released by the Accountability Organization in 2008 and revised in 2020. Based on the efficient application of the organization's principles, it is a technical framework based on principles that ensures sustainability information for businesses of all kinds. It gives businesses the option to select their own assurance framework and designate a specialized service provider or an audit and assurance services firm for carbon emissions disclosures (Datt et al., 2022). Additionally, the International Organization for Standardization's third section of ISO Standard No. 14064 of 2018

❖ **Regarding the criteria for measuring the validity of management's assertions disclosed in the climate change report**

These standards fall into two categories: technical standards and accounting standards. When conducting the assurance process, the auditor uses the following accounting standards published by professional accounting authorities as a foundation for assuring the accuracy of the measurement and disclosure of this information in the report: (Hales, 2023):

- Businesses must declare their greenhouse gas emissions in compliance with the Greenhouse Gas Protocol, according to the 2000 Carbon Disclosure Project (CDP) Guidelines.

- Various environmental topics, including emissions, materials, energy, water, wastewater, biodiversity, and forest programs, are included in the Global Reporting Initiative (GRI), a global reporting initiative that offers a framework for reporting on economic, environmental, and social performance. Environmental performance is one of these dimensions (GRI, 2021).
- The primary guidelines for reporting on climate-related environmental financial disclosures are the Financial Stability Board's Task Force on Climate-Related Financial Disclosures (TCFD) 2017 and 2021 recommendations, which concentrate on revealing the financial effects of climate-related opportunities and risks(TCFD; ٢٠١٧;2021).
- The European Commission released the Corporate Sustainability Reporting Directive (CSRD) in November 2020. It mandates that businesses reveal more specific information about sustainability and highlight the information that is revealed, which includes social and environmental issues, employee treatment, human rights protection, fighting bribery and corruption, and diversity on corporate boards of directors.
- The International Sustainability Standards Board (ISSB) of the International Financial Reporting Standards Board (IASB) released the International Financial Reporting Standard on Sustainability (IFRS S1) and the International Financial Reporting Standard on Climate-related Disclosures (IFRS S2) in 2023.

Along with the relevant applicable laws and regulations, this is in addition to the guidelines for listing and delisting from the Egyptian Stock Exchange, the requirements of the Egyptian Corporate Responsibility Index 30 EGX, the guidance manual for listed companies to disclose sustainability performance, and the Financial Regulatory Authority No. (01089 of 2021) regarding the controls for disclosure by listed companies on the Egyptian Stock Exchange of environmental, social, and governance practices related to sustainability and the financial impacts of climate change.

Additionally, the International Organization for Standardization (ISO) published ISO Standard No. 14064 of 2018 on the assurance service for the disclosure of greenhouse gas emissions in 2006 and 2018. In its two sections, Part 1 and Part 2, it outlines the fundamentals, specifications, and rules for quantifying and disclosing the quantity of greenhouse gas emissions and removals at the company level. Part 2 of the standard addresses measuring and reporting emission reductions brought about by the firm's operations, whereas Part 1 concentrates on quantifying and reporting greenhouse gas emissions and their reductions (Limpitlaw et al., 2017).

6.2The proposed framework of professional assurance of reporting of climate change and its impact on the stock price of the firm

6.2.1 The proposed framework of professional assurance of disclosure of climate change

6.2.1.1 The role of the auditor in professional assurance of climate change:

In this section, the researcher addresses the role of the auditor in professional confirmation of companies' disclosure of climate changes. Description of the professional assurance service on companies' disclosure of climate change, defining management's responsibilities regarding this service, determining the auditor's responsibilities for it, the auditor are planning and performance for the assurance process, and finally how to prepare his report on it. This is as follows:

6.2.1.2 Description of the professional assurance service on firms' disclosure of climate change:

The auditing profession is considered one of the professions most characterized by constant development and continuous modernization, as well as intense competition among practitioners of the profession as a result of the rapid developments surrounding auditing firms, Which entails that these firms keep pace with current developments, especially with regard to changes in environmental activities, so that they can improve the performance of their auditors to ensure the provision of audit services efficiently and effectively in order to support the confidence of users of audit reports and meet the requirements of stakeholders and users of reports. (Beisland et al., 2015).

The professional assurance service on firms' disclosure of climate change can be defined as external assurance (by an independent third party) of non-financial information including information related to climate change as well as other sustainability information (in order to add credibility and reliability to the information disclosed and enhance stakeholder confidence) (Metwally & EL gareb, 2023).

Therefore, from the previous definition, the goal of the professional assurance service on firms' climate change disclosure can be determined as follows:

- Providing an impartial technical opinion regarding management's assertions about the results of activities related to climate change, both risks and opportunities.
- Obtain assurance about whether information about the results of activities related to climate change is free of material misstatement.

- Improving the disclosure process and increasing its quality to achieve greater credibility and benefit for stakeholders.

6.2.1.3 Determine management responsibilities:

When it comes to climate change, management and auditors have significant obligations. The following points can be used to establish management responsibilities: (Ross, 2021):

- Describe climate risk and examine how risk adaptation and reduction affect organizations, finances, and strategy.
- Create unbiased, practical cost and liability estimates and make sure all legal requirements are met.
- The disclosure function (disclosure of risk related to the effects of climate change).
- Including interested parties in the disclosure process for climate change.
- A letter designating the auditor to ensure that companies disclose climate change.
- The terms and scope of the task are agreed upon with the auditor.
- Giving the auditor the resources he needs to gather the required data and carry out the required tests in order to reach his decision

6.2.1.4 Defining the responsibilities of the auditor in serving the professional assurance of companies' disclosure of climate change.

One could argue that the terminology created by the disclosure of climate change reflects anticipated shifts in the duties and obligations of auditors with reference to climate change reviews. We conclude from the information presented in (CAQ, 2023) that the duties and obligations of auditors with relation to disclosure may change. Climate change falls into one of the following categories:

1. The auditor's duty to evaluate climate change information during the financial statement audit:

- In order to determine how and when management expects climate-related risks to affect an entity, as well as how management intends to account for these risks when preparing financial statements, the auditor may feel compelled to ask management, including staff members outside the financial department (such as the chief sustainability officer, office of general counsel, risk, compliance, or sustainability 40 committees), questions in order to assess the potential impact of climate-related risks.
- A financial statement auditor must do a risk assessment in accordance with PCAOB audit requirements, which include learning about the company and its surroundings. The firm's goals and plans, pertinent

industry, regulatory and other external factors, and business hazards that could be expected to result in the risk of material misstatement are all taken into account in the auditor's risk assessment. Climate-related risks and their possible effects on the company's financial statements are part of the risk assessment. The auditor must create an audit response that addresses the risk of substantial misrepresentation in the affected financial statement accounts and disclosures if they find a risk associated with climate.

- When assessing the suitability and sufficiency of audit evidence gathered in response to material misstatement risks, including those pertaining to climate change, the auditor also considers any contradicting information that comes to his attention during the audit process.
- Management will be in charge of creating financial reports for internal control to accurately identify and account for climate-related risks, to the extent that these risks materialize as the possibility of material misstatements that could have an impact on accounting or disclosure. In situations where the auditor is hired to perform an audit of internal control financial reporting, the auditor will also evaluate whether the firm's controls are set up and functioning efficiently to help prevent or identify fundamental errors in the firm's financial statements, as well as how the firm's internal control financial reporting relates to climate-related information included or disclosed in the financial statements. Auditor's responsibility for assessing climate change disclosure as part of an engagement, which are:
- Engagements involving examinations (also known as reasonable assurance engagements): The practitioner provides an unbiased assessment of whether or not information pertaining to climate change complies with the Standards in all relevant ways. More thorough than a review engagement, an audit engagement is the closest thing to the reasonable assurance found in a financial statement audit. A review engagement entails gaining enough knowledge about the topic and other engagement circumstances to recognize and evaluate the risks of material misstatement and to serve as a foundation for creating and carrying out procedures to address the risks that have been identified. This entails learning about internal controls, assessing how pertinent controls are designed, and figuring out if they have been put into place. If the auditor plans to use the operational effectiveness of controls to determine the scope, timing, and nature of other processes, as well as in some other situations, they must design and conduct tests of the operating effectiveness of pertinent controls.

- Limited assurance engagements, often known as audit engagements: In order to make climate-related data consistent with the standards, the practitioner makes a determination about whether any significant changes need be made. Although the auditor's assurance in an interim examination of the financial statements is equal to the practitioner's limited assurance in a review engagement, a written report is always issued for an attestation review engagement (as opposed to an interim audit of financial statements). The breadth of the actions carried out in a screening engagement is significantly smaller than that of a screening engagement. Finding and concentrating on areas where there is a higher chance that the subject is significantly misstated is part of the audit engagement. Although the practitioner may decide that other methods are more effective or efficient for gaining limited assurance, audit evidence gathered through inquiry and analytical techniques will typically give the practitioner a reasonable foundation for doing so. In review engagements, testing of controls is less frequent.

1. Changes related to the personal characteristics of the auditor:

The following personal qualities are essential for auditors to have in order to fulfill their function when examining changes in environmental activities:

- They have a lot of experience working alone and have a long history. Gather proof to assess the accuracy and dependability of data and information utilized in decision-making and external reporting.
- Through their knowledge of financial statements and internal control over financial reporting audits, they are adept at comprehending the company, its business cycles and operations, and how the company generates value.
- Take advantage of having access to experts in a range of ESG topics, including those pertaining to climate change, such greenhouse gas emissions.
- According to established independence criteria for such attestation services, they must be independent from the companies they audit.
- Planning and carrying out assurance engagements with professional skepticism is required by applicable standards.
- Possess expertise in creating reports on adherence to several relevant frameworks and standards.
- They must keep up a quality control system that gives the audit company assurance that its auditors have followed set guidelines and that the reports they have produced are suitable.
- They must follow the rules for ethics, experience, and continuous professional education, which include specialized training. Specialists in a variety of environmental, social, and governance domains,

particularly those pertaining to climate change such greenhouse gas emissions, are available to auditors.

6.2.1.5 Planning & performing the process of assuring firms' disclosure of climate change:

According to the Alter, a number of criteria determine whether the auditor's function is activated throughout the design and execution of the auditing process connected to climate change. The most significant of these aspects are as follows:

- When learning about the firm and its surroundings, the auditor may take climate-related risks into account.
- Identifying the type of environmental regulations and rules that apply to the company's activities in order to ascertain whether or not the firm's climate-related environmental operations lead to infractions.
- To audit the firm's climate-related environmental operations and the degree to which it assumes responsibility for climate-related environmental performance, make sure senior management is on board.
- Determining the types of materials and operating procedures utilized in the firm's operations and activities, as well as the sources from which they are obtained, in order to assess the environmental harm they cause.
- If the firm has any, ascertain its objectives and plans for adapting to climate-related environmental activities.
- Establish the goals and scope of the firm's climate-related environmental auditing efforts.
- Create a plan to audit the firm's environmental actions related to climate change and assemble a team to complete the assignment.
- The procedure of auditing the firm's climate-related environmental operations is being put into practice.
- Among other aspects of the firm's internal control system, the auditor needs to learn about the firm's risk assessment procedure that is pertinent to financial statement production. A firm's comprehension of its capacity to recognize climate-related business risks that are pertinent to its financial reporting goals, evaluate the importance of such risks (including their probability of happening), and take appropriate action may be impacted by climate change. In order to confirm the efficacy of the firm's environmental management system, the auditor must investigate and assess the climate-related hazards and internal control systems of firm and gather adequate and pertinent data.
- In order to learn how and when management anticipates that climate-related risks could affect the firm, as well as how management intends to take these risks into account in its preparation, the auditor may feel compelled to question management, including staff members outside

the financial department (such as the chief sustainability officer, office of general counsel, risk and compliance, or sustainability committees).

- Comprehending the control environment in order to gauge management's stance and level of awareness on internal controls pertaining to environmental processes associated with climate change and their significance. Maintaining an information system appropriate for the audit purpose while keeping an eye on adherence to the firm's climate-related environmental regulations.

6.2.1.6 Report on the results of the professional assurance service on firms' disclosure of climate change:

As a fundamental requirement to verify the auditor's assurances, the auditor's report has become increasingly important when auditing the financial accounts. In order to grow and improve the quality of the form and substance of this report, numerous professional bodies that oversee the auditing profession have attempted to set up numerous rules and norms (Maso et al., 2020) . It is important to note that the preparation, presentation, and subsequent audit of the financial statements have been clearly impacted by the company's environmental operations. As a result, the auditor's attention must be partially focused on the firm's environmental considerations throughout the entire audit process, from planning to implementation to reporting.

Given the crucial role auditors play in using the independent review process to strengthen the credibility of financial statements, auditors are able to thoroughly evaluate the implications of climate change concerns and any possible repercussions on financial reports. Regarding this, the Big 4 corporations have declared that the modifications Since the Big 4 showed how the auditor can verify information pertaining to the disclosure of climate change risks within the social governance framework; climate change is a significant audit issue in the annual reports of these companies' clients (Kannan Y. H. et al., 2021).

As the revised International Standard on Auditing ISA 570 explained in the first paragraph, the tasks and responsibilities of the auditor regarding auditing data, the study (Read et al., 2018) states that auditors will issue reports related to continuity, which would express whether the firm is at risk of bankruptcy or not. In certain instances, a climate-related risk may also result in an occurrence or circumstance that prompts the auditor to express professional skepticism about the firm's viability. Additionally, certain institutions run the possibility of lawsuits that could impair their capacity to the firm of a set of climate damage risks necessitates that the firm continues its operations going forward. Thus, if it is demonstrated to the auditor that the company is not dedicated to following environmental regulations, Based on the study of Alter's publications, it can be concluded that the disclosure of climate change has resulted in a vocabulary that reflects anticipated changes in the phases of climate change review. The audit report illustrates these changes as follows:

- This further confirms the transparency of financial reports regarding current and future climate-related obligations that are made. The auditor must obtain written declarations that management has disclosed to him all cases of non-compliance with known or potential environmental laws and regulations, the impact of which will be taken into account when preparing the financial statements. Businesses do it.
- The appropriateness or sufficiency of the disclosures must be mentioned in the auditor's report. For instance, despite the fact that these disclosures are likely to influence the choices made by those who use the financial statements, an entity may not have sufficiently disclosed the impact of climate-related risks in the financial statements.
- In addition to evaluating whether the firm's controls are set up and functioning properly to help prevent or identify any material errors in the firm's financial statements, the auditor's report must also detail the extent to which the internal control systems are able and efficient to implement related environmental obligations.
- The application of the firm's accounting policies must be included in the auditor's report. For instance, improper asset recognition and measurement due to the impact of climate-related risks not being sufficiently considered in the applicable impairment calculations.
- In some situations, the pertinent risks might result in an incident or situation that raises questions about the firm's capacity to operate as a continuing concern. Therefore, the firm's ability to continue in the event that it does not adopt environmental principles and rules must be included in the auditor's report.

6.2.2 The impact of proposed framework of professional assurance of reporting of climate change on the stock price of the firm

The favorable effect of the auditor's professional assurance service on financial and non-financial information on capital markets, particularly choices to assess the market value of firm shares, has been explained by accounting literature using a number of accounting theories. The information asymmetry theory, the legitimacy theory, the agency theory, and the signaling theory are the most significant of these theories. (Datt et al., 2022; Reverte, 2021; Fan et al., 2021).

The role that auditing plays in addressing agency issues, lowering agency costs, lowering information asymmetry, and giving credibility to environmental performance data is explained by theories of agency and information asymmetry. In order to deliver more transparent and trustworthy information, which improves stock performance by raising analyst forecast accuracy and lowering the cost of capital, shareholders require this service. (Reverte, 2021; García-Sanchez et al., 2022)

However, according to signaling theory, businesses that are highly committed to social and environmental responsibility will receive a lot of attention for their reports. This is done to increase the credibility of the information in these reports and give the market a good indication of how successful these businesses are at their commitment to corporate social responsibility and how appropriate their actions are when it comes to sustainability and environmental conservation (Clarkson et al., 2019; Reverte, 2021).Legitimacy theory states that investors will appreciate positive affirmation that validates a firm's information and practices in front of the public because external validation of environmental reports' structure and content will lessen users' mistrust of them, which lowers the possibility of significant errors and omissions (Reverte, 2021).

Whether this focus is on environmental performance data included in integrated business reports, sustainability reports, or corporate social and environmental responsibility reports, accounting literature has examined the effect of stressing the disclosure of a company's environmental performance on investors' choices and assessments in this context and in light of these theories. There are those who concur. In light of these theories, accounting literature has examined how investors' decisions and assessments are affected when a company's environmental performance is emphasized, whether this focus is on environmental performance data found in sustainability reports, integrated business reports, or corporate social and environmental responsibility reports.

The market value of stocks, stock liquidity, and the accuracy of financial analysts' expectations are all positively impacted by external assurance on integrated business reports, according to several studies (Reimsbach et al., 2018; Caglio et al., 2019; Reverte, 2021; Sanchez-Gar et al., 2022). Additionally, the cost of capital is decreased. According to the study by Caglio et al. (2019), the assurance on integrated reports lessens the negative effects of poor textual features, and the beneficial effect of emphasis increases when integrated reports are brief and easy to read. If businesses release integrated reports that are hard to read but verified by an impartial third party, this lessens the detrimental effect of reading difficulty on market value; if long integrated reports are prioritized, this lessens the detrimental effect on stock liquidity and analysts' expectations are less dispersed, suggesting that assurance serves as a mechanism to increase credibility for external users.

The International Auditing and Assurance Standards Board (IAASB) (International Federation of Accountants (IFAC), 2012) released ISAE 3410 Assurance Engagements on Greenhouse Gas Emissions in response to the growing demand for assurance of corporate climate change disclosures. This is despite the existence of ISAE 3000 (Revised) Assurance Engagements Other Than Audits or Reviews of Historical Financial Information, which pertains to the assurance of general sustainability information (Zhou et al., 2016). As part of the assurance of a sustainability report or annual report, or on a stand-alone GHG report, ISAE 3410 highlights the necessity of implementing the assurance of carbon emissions disclosure (Datt et al., 2019).

According to the Kalita & Maji 2022 study, there is a positive and strong correlation between external audit fees and climate disclosure, which means that the market value of the stock rises as climate disclosure levels rise.

So, and in the light of the previous presentation of previous studies and the study problem, the study hypothesis can be formulated as follows:

HI: Professional assurance on the reporting of information related to climate change by firms listed on the Egyptian Stock Exchange has a positive impact on its stock price.

6.3 Research method:

This part discusses the selection process of the research sample, the criteria that affect the sample selection process. Also, it includes the sources of data that are used in this research. In addition, it contains the main research variables and how to measure these variables as well as the research models applied to test the hypotheses in order to achieve the research objectives.

6.3.1 Data and sample selection

The study population consists of professional investors, including investment trustees from certain commercial banks and their assistants, investment managers in equity investment funds, and financial analysts working in brokerage and securities trading companies. A sample of 100 investors was drawn. By analogy with (Ali, 2019 ؛ Reimsbach et al., 2018 ؛ Hoang & phang 2021), the number and percentage of valid responses that were statistically analyzed was 76%.

6.3.2 Experimental Task and Design:

The researcher employed an experimental design to examine the effect of the auditor’s professional assurance on the reporting of climate change-related information by firms listed on the Egyptian Exchange, and its effect on the firm’s stock price.The experimental design consisted of the following sections:

Section One: Demographic Data

This section includes participants' demographic information, such as their level of experience and professional qualifications as investors.

Section Two: First Experimental Case

This case presents actual financial statements for a publicly listed joint stock firm operating in the chemical industry for the years 2023 and 2024. The financial statements were reformatted into summarized financial reports, accompanied by the firm's disclosure of climate change-related information.

Section Three: Second Experimental Case

This case includes the same data as the first case, with the addition of a professional assurance report from the auditor regarding the firm's climate change-related disclosure

6.3.3Variables' measurement:

The following table shows the characterization and measurement of study variables as follows:

Table (1) Variables' definition

Variables	*Measurement*
Independent variable	
Professional assurance on the reporting of information related to climate change	This was achieved by presenting respondents with information concerning the firm's disclosure of climate change-related matters, accompanied by a professional assurance report attesting to the credibility of the disclosed information (Muhammad 2020 :Moses 2018:Mamman et al ., 2021) This variable was measured by providing the auditor's professional assurance report on the firm's performance report (S) on climate change.
Dependent variable	
Stock price	It is measured by the sample participants' estimation of the firm's share closing price at the end of the next period and their decision regarding investment in the firm's shares. (The Financial Regulatory Authority, 2017 : Rikkert , 2014 & Shawky , 2014)

6.3.4 Data analysis and Hypotheses testing:

The researcher used a set of statistical tests program (SPSS 25) to conduct the necessary statistical analysis of the observations collected from the survey list to reach statistical results that support the acceptance or rejection of research hypotheses. These tests included:

6.3.4.1 Reliability Testing:

To ensure the reliability and internal consistency of the items and questions that constitute each variable in the study, as addressed in the distributed questionnaire, Cronbach's Alpha test was conducted. This statistical test is widely recognized as appropriate for assessing the reliability of measurement instruments. It indicates the degree of consistency in respondents' answers to the experimental scenarios. The minimum acceptable value for Cronbach's Alpha is 0.60, while the optimal range lies between 0.70 and 0.80. Higher values of this coefficient indicate greater reliability of the data, thereby enhancing the generalizability of the sample results to the study population. Referring to the results in Table (2), the Cronbach's Alpha coefficient for the experimental case questions was found to be 0.897, which indicates a high level of data reliability.

Table (2) Cronbach's Alpha Coefficient for the Study Sample

Reliability Statistics	
Cronbach's Alpha	N of Items
.897	12

6.3.4.2 Wilcoxon Signed-Rank Test:

The Wilcoxon Signed-Rank Test was employed to examine the effect of auditor professional assurance on the firm's reporting of climate change-related information and its stock price. This test is one of the non-parametric methods used to determine whether there are statistically significant differences between the medians of two related samples. Accordingly, the statistical hypotheses for this test can be formulated as follows:

- **Null Hypothesis (H_0): MA = MB**
  There are no statistically significant differences between the medians of the same sample regarding the variation in professional assurance on climate change-related disclosures and its impact on their decisions.

- **Alternative Hypothesis (H_1): MA ≠ MB**
  There are statistically significant differences between the medians of the same sample concerning the variation in the practice of internal audit roles and its influence on their decisions.

According to this test, if the **p-value** is less than 5% at a 95% confidence level, the null hypothesis is rejected and the alternative hypothesis is accepted. Conversely, if **the p-value** is greater than 5%, the null hypothesis is accepted, and the alternative is rejected.

6.3.5 Descriptive Statistics:

The researcher relied on 76 responses .As shown in Table (3), the distribution of the research sample of investors by educational qualification indicates that bachelor's degree holders represent 31.6% of the total sample. They are followed by holders of diplomas and professional certificates, who also represent 31.6%. Master's degree holders account for 26.3%, while PhD holders represent the smallest group at 10.5% of the total research sample.

Table (3) Descriptive Statistics (Investor Qualification)

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Bachelor's Degree	24	31.6	31.6	31.6
Diplomas and Professional Certificates	24	31.6	31.6	63.2
Master's Degree	20	26.3	26.3	89.5
Ph.D	8	10.5	10.5	100.0
Total	**76**	**100.0**	**100.0**	

As shown in Table (4), the distribution of the research sample of investors based on years of experience indicates that investors with 10 years or more of experience represent 72.3% of the total sample. Those with 5 to less than 10 years of experience account for 17.1%, while investors with less than 5 years of experience represent 10.5% of the total research sample.

Table 4: Descriptive Statistics (Investor Experience)

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 5 years	8	10.5	10.5	10.5
From 5 to less than 10 years	13	17.1	17.1	27.6
From 10 to less than 15 years	27	35.5	35.5	63.2
15 years or more	28	36.8	36.8	100.0
Total	**76**	**100.0**	**100.0**	

6.3.6 Hypothesis Testing:

To test the first research hypothesis (H1), which states that "Professional assurance on the reporting of information related to climate change by firms listed on the Egyptian Stock Exchange has a positive impact on its stockprice".

The researcher employed **the Wilcoxon Signed-Rank Test** for two related samples in this context. Table (5) below presents the results of this test.

Table (5) Wilcoxon Signed-Rank Test Results for H1

		N	Mean Rank	Sum of Ranks
Investors' Perception of the Impact of Professional Assurance on the Disclosure of Climate Change Information on stock price (BC) - Investors' Perception of the Impact of Corporate Disclosure of Climate Change Information on stock price (A)	Negative Ranks	4[a]	14.13	56.50
	Positive Ranks	**62[b]**	34.45	2154.50
	Ties	10[c]		
	Total	76		
a. BC < A				
b. BC > A				
c. BC = A				

Test Statistics

	BC - A
Z	-6.790[b]
Asymp. Sig. (2-tailed)	.000
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

Referring to the results of the statistical analysis in Table (6), it is observed that 62 out of 76 respondents (i.e., 81.5% of the total sample) demonstrated a higher level of perception regarding the professional assurance provided by the auditor under the second experimental condition compared to the first. Conversely, 4 respondents (5%) exhibited a lower level of perception under the second condition compared to the first. The remaining 10 respondents (13%) showed no difference in perception between the two experimental conditions. These results indicate a predominant trend among respondents **toward a higher perception** of the role of professional auditor assurance on the disclosure of climate change information.

Furthermore, the results of the Wilcoxon Signed-Rank Test show that the p-value was 0.000, which is below the 5% significance level, leading to the rejection of the null hypothesis that the two-group means are equal. Consequently, the alternative hypothesis is accepted, indicating a statistically significant difference in favor of the condition with the higher mean—namely, investors' perception in the second experimental condition. This finding supports **the acceptance of the first research hypothesis (H1),** which states that investors perceive a greater impact of auditor professional assurance on stock price in the second condition compared to the first. The mean perception score in the second condition was 4.52, compared to 4.07 in the first condition.

The present finding is consistent with previous studies Gianarakis et al., 2018; Radhouane et al., 2020). Whereas independent third-party assurance enhances the credibility of non-financial disclosures (such as climate change reporting) and thus establishes firm reputation and improves stock price. Also, Independent assurance of environmental initiatives prevents companies from manipulating the dissemination of climate change information. Furthermore, external assurance plays an important role in assessing risks and concerns related to climate change, thereby improving the transparency of environmental reporting related to the level of climate change-related disclosures and enhance stock price.

6.4 Research results and recommendations

6.4.1 Research results

Also , The theoretical study states that investors perceive a greater impact of auditor professional assurance on stock price.Whereas independent third-party assurance enhances the credibility of non-financial disclosures (such as climate change reporting) and thus establishes firm reputation and improves stock price. Also, Independent assurance of environmental initiatives prevents companies from manipulating the dissemination of climate change information. Furthermore, external assurance plays an important role in assessing risks and concerns related to climate change, thereby improving the transparency of environmental reporting related to the level of climate change-related reporting and enhance stock price.

These results of experimental study conclude that there is a positive effect of professional assurance on the reporting of climate change-related information by firms listed on the Egyptian Stock Exchange on its stock price.

6.4.2 Research recommendations;

The researcher recommends the need to activate the role of auditors in ensuring the reporting of climate change information, which will assist stakeholders in making decisions related to these companies. This can be achieved by qualifying and training auditors in providing professional assurance on climate change-related reporting, and by developing their skills and professional competence to perform this service. The researcher also recommends the issuance of an Egyptian standard for the assurance of climate change information, in light of the recommendations and guidelines of local and international professional and academic organizations.

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