An-Najah National University
Faculty of Graduate Studies

THE IMPACT OF AUDIT COMMITTEE CHARACTERISTICS ON ENVIRONMENTAL DISCLOSURE: EVIDENCE FROM STOXX EUROPE 600 INDEX DURING THE PERIOD 2012-2018

By
Ahmad Muhammad Tawfeek Abed

Supervisors
Dr. Muiz Alia
Dr. Aladdin Dwekat

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This Thesis was defended successfully on 14/07/2025 and approved by:

Dr. Muiz Alia **Supervisor**	**Signature**
Dr. Aladdin Dwekat **Co-Supervisor**	**Signature**
Dr. Saher Aqeil **External Examiner**	**Signature**
Dr. Gassan Daas **Internal Examiner**	**Signature**

Dedication

To a source of giving, safety, and Savior…...My Dear Father.

To the source of love and the origin of the story…...My Dear Mother.

To the refuge and support…. My Dear Sisters and Brothers.

To the one who gave me the passion for love, life, and hope to survive.

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To the defenders of the nation's dignity and pride…. The heroes of Gaza, the glory.

To the beacon of knowledge in our wounded homeland… An-Najah National University.

To the bearers of the greatest message in life......My Dear teachers.

To all of them, and to everyone reading this, I dedicate my research.

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Researcher: Ahmad Abed

Declaration

I, the undersigned, declare that I submitted the thesis entitled**:**

THE IMPACT OF AUDIT COMMITTEE CHARACTERISTICS ON ENVIRONMENTAL DISCLOSURE: EVIDENCE FROM STOXX EUROPE 600 INDEX DURING THE PERIOD 2012-2018

I declare that the work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification

Student's Name **Ahmad Muhammad Abed**

Signature: Ahmad Abed

Date: **14/07/2025**

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Abstract

Environment, in its simplest concept, is everything that surrounds humans from living organisms on the surface of the earth, and the environment includes the earth and what it contains and space and what it contains, from here we assert that we deal with the environment periodically and it determines our survival. The researcher can refer to environmental disclosure as a form of corporate social responsibility resulting from the practice of its activities that negatively affect the environment, as environmental disclosure protects the environment from all forms of pollution. Since the audit committee helps the company's managements at all levels to control and improve their performance to achieve all their goals, this research came with the aim of revealing the impact of the characteristics of the audit committee, which are financial expertise (ACFEX), independence of the audit committee (ACIND), number of committee meetings (ACME), and number of audit committee members (ACSIZ), on environmental disclosure: evidence from the STOXX Europe 600 index during the period 2012-2018.

The study included a sample of 600 companies, with 4,171 entries out of 4,200, representing a representativeness rate of 99.3%. Environmental disclosures were measured using the Bloomberg Environmental, Social, and Governance Disclosure Index, with a disclosure score ranging from 0 to 100. Audit committee characteristics were measured by measuring its four main dimensions. In this study, we used panel regression analysis to test the effect of audit committee characteristics on environmental disclosure, using STATA software. Descriptive analysis and a correlation matrix were employed to measure the relationship between variables, in addition to regression analysis to determine the direction and strength of these relationships.

The study revealed a strong positive effect of both the number of audit committee meetings and the number of audit committee members on environmental disclosures, while the study found no significant effect of either the financial expertise or the independence of audit committee members. The study also revealed variations in the quality and quantity of environmental disclosures among companies listed on the Stoxx Europe 600 Index, with disclosures sometimes substantial and sometimes minimal. The quality of environmental disclosures also varied, with some being mandatory and others voluntary.

Keywords: Audit Committee, Audit Committee Characteristics, Environmental, Social and Governance (ESG), Environmental Disclosure (ED), Global Reporting Initiative (GRI).

Chapter One

A General Framework of the Study and Its Background

1.1 Introduction

The main objective of preparing financial statements is to provide users of these statements with relevant reliable information. Thus, rational decisions with high likelihood to be in their interest are mad (Baig et al., 2022).

Considering the complexity of financial transactions following, the openness of markets and technological and informational progress around the world, it is imperative for companies to take utmost care in preparing their financial statements. Therefore, all companies had to appoint their own audit committee (AC) (Song et al., 2022).

AC is an operational committee composed of the company's board members; its responsibility includes overseeing and disclose the company's financial reports (FR) (Choi, Lee, & Park, 2013). In addition, with the increasing failures and setbacks that have occurred for many international companies, such as the collapse of the American energy company (Enron) and the global financial crisis (GFC), it is imperative for companies to emphasize governance practices, enhance the transparency of disclosed financial and non-financial information, to obtain more effective control (Woidtke & Yeh, 2013). According to Buallay & Al-Ajmi (2020), one of the most important principles of corporate governance (CG) is accountability for companies' actions towards shareholders and their transparency, represented in their disclosure of financial and non-financial information. It is worth noting, that with the emergence of the agency problem, the owners need high transparency to ensure the performance of the companies' managements well, and the ability to hold both the executives and AC accountable. Non-financial disclosures are just as important as financial disclosures, and this emerged after the introduction of the global reporting initiative (GRI). GRI includes environmental, social and governance (ESG) disclosures. Therefore, according to Leung & Gray (2016), ESG sustainability performance indicators would help the company to develop its strategies, and assist the stakeholders associated with the company in evaluating its sustainability performance.

In this research, we will study the impact of the characteristics of the audit committee represented by (Audit Committee Financial Expertise, Audit Committee Independence, Audit Committee Meetings, Audit Committee Size) on the environmental disclosure of European companies listed on the STOXX Europe 600 index during the period 2012 to 2018.

1.2 Problem Statement

With the beginning of the twenty-first century, the demands of stakeholders including shareholders, customers, employees, suppliers, as well as environmental and social activists, and the media, that companies take on a great responsibility towards society and the environment (Sajjad et al., 2019). This trend was supported, as mentioned earlier, by Global Financial Crisis and fluctuating market conditions, and prompted companies to think clearly when making sustainability choices in making their critical organizational decisions (Arif et al., 2021). Companies are making unremitting efforts to move forward with improving their business models and systems in preparing FR, to meet the requirements of stakeholders associated with them, thus, to reach distinctive environmental disclosures (ED) that place them at the top of the ladder of economic competition, and their most attractive appearance (Jiang et al., 2022). According to Garcia, Da-Silva, and Orsato (2017), the reporting of environmental management information, along with compliance with the best practices of ESG has taken great interest by business managers, especially those working in environmentally sensitive industries such as: (the energy industry, the water industry, the oil, gas and coal industry, and the pharmaceutical industry), with the aim of achieving a sustainable environment and a fair society. If we track ESG disclosure, it was previously voluntary and non-compliant, because preparing FR lake relevant standard frameworks, because of the great concerns about the quality and objectivity of these reports (Hummel & Schlick, 2016). In the presence of an agency problem, corporate managers can use ESG disclosures to advance their personal interests and reputations. Besides, in line with legitimacy theory (LT), companies only report positive ESG to maintain the legitimacy of their business (Broadstock, Chan, Cheng, & Wang, 2021).

According to the critical importance of ESG disclosures, the presence of AC has become mandatory to improve the quantity and quality of ESG reports. In the context of ESG disclosures, (Arif et al., 2021; Appuhami & Tashakor, 2017), argues that AC's characteristics will provide effective oversight to achieve the desired balance between stakeholder objectives and management objectives. Recently, companies have relied on their environmental performance in preparing sustainability and integrated reports (Nishitani et al., 2021).

We will solve the basic problem of the study by answering its main question: **Do the characteristics of the audit committee affect environmental disclosure?**

We will also answer to these sub- questions:

- Does expertise of the audit committee affect environmental disclosure?
- Does Independence of the audit committee affect environmental disclosure?
- Does the number of meetings of the audit committee affect environmental disclosure?
- Does size of the audit committee affect environmental disclosure?

1.3 Objectives

The main objective of this study is examining the relationship between the characteristics of AC and ED of companies listed on the STOXX Europe 600 index during the period 2012 to 2018.

The results of this study can achieve several sub-objectives, such as implications for policy makers and management to carry out reforms and new policies for CG related to environmental aspects, and to they may also contribute to overcoming the shortcomings of previous studies to know the relationship between the characteristics of AC and ED.

1.4 Importance of Study

Good CG is based on good AC, and these committees are viewed by investors as committees that work to improve the quality of FR to improve the process of making sound economic decisions. Recently, many social and environmental issues have emerged that companies must adhere to in response to sustainability in their current and future perspectives. Therefore, committees concerned with ESG pillars have developed a three-dimensional indicator (social, environmental, and governance) reported by the (Bloomberg ESG) database that shows the amount of companies' disclosure of information related to environmental, social, and institutional governance referred to as ESG_Score.

Environmental disclosures play an increasing role in enhancing corporate transparency and accountability. Given global trends toward sustainability and ESG, AC is an essential tool for ensuring companies' commitment to environmental disclosure., Therefore, studying the impact of AC characteristics on ED is an important issue, particularly in the field of accounting.AC characteristics on ED is an important issue, particularly in the field of accounting.

This study is expected to highlight the characteristics of both environmental and economic assessments, which will contribute to guiding environmental assessments to highlight the interest in environmental assessments and their valuable outcomes on corporate performance and access to environmental, social, and corporate governance. It is also expected to highlight the importance of environmental assessments from the perspective of current and potential investors, as well as decision-makers and economic policymakers, in improving and developing governance structures that support sustainable disclosure, which will play a significant role in enhancing investor confidence.

This study is expected to disentangle the characteristics of AC and ED, which will contribute to guiding AC to shed light on the interest in ED and its valuable results for the functioning of companies and access to ESG. It is expected to highlight the importance of ED from the point of view of current and potential investors, as well as decision makers and economic policy makers. makers

Chapter Two

Theoretical Background, Literature Review & Hypotheses Development

2.1 Introduction

This chapter explains many matters related to environmental disclosure, including the definition, objectives, audit committees in terms of definition and the important roles of these committees, in addition we will discuss some of the theories related to the subject of research represented in (Agency theory (AT), shareholder theory (SHT), stakeholder theory (ST), legitimacy theory (LT), and resource dependence theory (RDT)) to help us in developing the hypotheses of the study. then, we will develop the study hypotheses related to the independent variables of the study.

2.2 Overview of Environmental Disclosure

2.2.1 Corporate Governance

According to Adel, Hussain, Mohamed, and Basuony (2019) & Baxter & Cotter (2009), there are four popular definitions of corporate governance:

a- The Organization for Economic Cooperation and Development definition: CG is "A system by which businesses are directed and controlled." This system defines the full and clear division of power among all relevant parties within the company at all levels and with all their functions (the board of directors, senior management, employees, shareholders, and stakeholders). It defines the desired objectives and the means of achieving them, as well as the mechanisms for monitoring performance. It also clarifies all the rules, standards, and procedures for internal and external decision-making within the company. This definition focuses on the system, justifies the relationships between all the company's financial and non-financial operations, and clarifies the purpose of governance (direction and control) to achieve the objectives of monitoring the company's performance.

b- Cadbury Report_UK,1992 Definition (The first comprehensive report on corporate governance, highlighting its importance and emphasizing the importance of accountability and the need for separation of powers): CG is "the system by which corporations are directed and controlled". Cadbury Report represents a historic turning point in the development of corporate governance globally, particularly in the Commonwealth of Nations, and the OECD definition is inspired by it. CG is a system that establishes a balance between the exercise of power and accountability, aiming to enhance the effectiveness of a company's performance while ensuring its long-term sustainability.

c- The World Bank's definition (focusing on the role of governance in economic development and investment attraction): CG is "the set of relationships among a company's management, board of directors, shareholders, and stakeholders." CG is an organizational structure that defines a company's objectives, the means of achieving them, and monitors its performance. Note that this concept focuses on the relationships that bind all parties to a company (reframes OECD and Cadbury Report concepts) from the perspective of development institutions.

d- ACCA definition (Focus on practical): CG is "the set of processes and structures that operate and direct organizations". CG defines relationships within and outside the organization (board of directors, senior management, shareholders, and stakeholders), contributes to the effective achievement of the company's organizational objectives, effectively manages risk, and enhances long-term value. CG is critical for financial professionals because it clearly articulates processes and structures, links them to risk management, and drives sustainable value.

The four previous definitions of CG form the intellectual foundation for understanding and applying it in all economic and legislative systems. CG agrees on six fundamental points, despite their different formulations:

1. Framework/ System: Governance is a framework or system.
2. Management/ Direction and Control: Concerns how a corporate is managed and directed.
3. Relationships: Defines the relationships between (board of directors, management, shareholders, stakeholders).
4. Goal setting and achieving: Contributes to defining objectives of corporates and the means of achieving them.
5. Control and accountability: Includes mechanisms to ensure accountability and monitor performance.

6. Interest protection: Focuses on protecting interests of stakeholders (especially shareholders and stakeholders).

2.2.2 Theoretical foundations of governance

According to Bode, Wagner, Petersen, and Ellram (2011); Canhoto & Wei (2021); Ho, Huang, & Karuna (2020); Ho, Huang, & Karuna (2020), CG is based on five basic theories (organizational, economic, and behavioral) to explain the relationship between all parties inside and outside the corporate, which we will summarize below:

Agency theory: The theory assumes the existence of a contractual relationship between the corporate's executive management (agents) and the owners or shareholders (principals). According AT, CG aims to reduce agency costs, through control mechanisms. The agency problem arises for several reasons:

1. Divergent interests: Management's objectives differ from those of owners or investors.
2. Information asymmetry: Management's information is more comprehensive and accurate than that of owners or investors.
3. Agency costs: Costs paid by owners or shareholders to monitor management (monitoring costs), costs borne by management to ensure transparency in the disposition of owners' funds (Bonding costs), and costs resulting from the continued divergence of interests that cannot be avoided while the problem persists (residual losses).

Shareholder Theory: The primary and sole objective of the corporate is to maximize the wealth of the owners. Milton Friedman is the main founder of SHT. Friedman's arguments can be summarized in four points:

1. Agency and Ownership: CEO is the agent of the owners, and his primary duty is to serve the interests of the owners.
2. Focus on profit: Any use of owners' funds that is not aimed at maximizing profit is considered an abuse of funds.
3. Individual, not institutional, responsibility: Social responsibility does not fall on the corporate as an entity, but on (shareholders, employees, customers, and

stakeholders) as individuals, that is, the social responsibility of stakeholders is only from their own money.

4. Compliance with laws and regulations to achieve profits (open and free competition).

Stakeholder Theory: ST states that a corporate must consider the interests of all parties involved in its transactions and activities. Stakeholders are not limited to owners and shareholders, but include a broad spectrum of stakeholders, including:

5. Employees: Rights and duties, working conditions, training, and development.
6. Customers: Quality of goods and services, customer protection, after-sales services.
7. Suppliers: Commitment to standards, fair partnerships, and safe supply chains.
8. local communities: Community justice, equitable natural resources, and environmental protection.
9. Creditors: Commitment to financial agreements.
10. Government: Compliance with laws and regulations.

Stewardship Theory: Stewardship theory assumes that managers are (stewards) of the corporate's assets, and they make every effort to work in the best interests of the corporate's owners. The basis of the relationship between managers and owners is trust and empowerment, not oversight and accountability. CEO must work effectively to promote leadership and strategic focus.

Resource Dependence Theory: RDT focuses on how a corporate manages its resources such as (firm capital, access to markets). The board of directors contributes to governance by bringing resources such as (expertise, reputation, and connections), which reduces uncertainty and increases the legitimacy of the company.

2.2.3 Governance implementation tools and mechanisms

Corporates need specific tools and mechanisms to ensure that principles, laws, and regulations are transformed into a tangible reality, enabling them to effectively implement CG, these tools and mechanisms can be denoted under eight main headings (Shaukat, Qiu, & Trojanowski , 2016; Dwekat et al., 2020; Broadstock et al., 2021):

Code of Conduct: Basic documents that define the ethical principles and values that must be adhered to in the corporate's dealings and by all employees at all levels. It aims to:

1. Guiding professional and ethical behavior.
2. Promoting a culture of responsibility and integrity.
3. Guidelines for resolving agency problems.
4. Guidelines for dealing with confidentiality, bribery, and corruption.
5. Guidelines for respecting laws.

The application of code of conduct are:

1. Available to everyone.
2. Included in the training and awareness programs.

Board Charter: Official documents that define (responsibilities and powers) of the BOD and all its subcommittees, such as (AD, the Remuneration Committee, etc.). It aims to:

1. Providing a framework for performing tasks.
2. Ensuring accountability.
3. Enhancing governance and transparency.
4. Facilitating communication.
5. Sustainability.

The contents of bord charter are:

1. Purpose of the Board.
2. Composition of the Board.
3. Roles and Responsibilities.
4. Meetings.
5. Decision-Making Mechanisms.
6. Compliance with Laws and Regulations.

7. Follow-up Procedures.
8. The Role of Board Committees.
9. Defining the Powers of Board Members.
10. Board Member Code of Conduct.

Board Performance Evaluation: Basic practices followed in the periodic performance evaluation of BOD and its subcommittees. It aims to:

1. Avoiding Overlap of Powers.
2. Enhancing Effectiveness.
3. Accountability.
4. Identifying Strengths and Weaknesses.
5. Improving Board Dynamics.
6. Ensuring Effective Achievement of Goals.

Evaluating methods of BOD are:

1. Internal evaluation: questionnaires and discussions.
2. External evaluation: independent consultants.

Evaluating outcomes of BOD are:

1. Directing plans for developing board members.
2. Restructuring committees.
3. Renominating members.

Internal Audit: An independent and objective function that provides (assurance and advisory) services, adding value to the corporate and improving its operations. It aims to:

1. Evaluating the effectiveness of internal controls.
2. Ensuring the safety of assets and the integrity of the financial system.
3. Detecting irregularities and errors.
4. Improving performance and efficiency.

5. Risk assessment and management.
6. Compliance with laws and regulations.
7. Providing assurance on the achievement of objectives.
8. Adding value to the corporate.

Whistleblower Mechanisms/ Hotlines: Confidential and secure channels provided by corporates to report any (illegal or unethical) behavior. Its early detection of violations of policies and laws such as (fraud, corruption, mismanagement). It aims to:

1. Encourage reporting.
2. Provide protection.
3. Identify and mitigate risks.
4. Promote a culture of ethics.
5. Promote accountability and transparency.
6. Build trust.
7. Improve organizational performance.

Board Training and Development Programs: Educational, training and development programs provided by the corporates on an ongoing basis to members of BOD, enabling them to keep pace with legislative and regulatory changes, standards, and trends. It aims to:

1. Raising awareness of roles and responsibilities.
2. Enhancing corporate governance.
3. Enhancing the efficiency of board members.
4. Developing the skills of board members.
5. Ensuring they are kept abreast of developments.

Disclosure Policy: A document that defines the corporate's commitment to transparency and disclosure of material (financial and non-financial) information to stakeholders. It aims to:

1. Providing disclosures in a timely, accurate, and quantitative manner.

2. Providing fairness in the way disclosures are provided.
3. Ensuring transparency.
4. Enhancing trust.
5. Making informed investment decisions.
6. Inclusiveness: Covering all types of disclosures (financial and non-financial).

Investor Relations: A strategic CG function overseeing effective communication with investors, the media, and financial analysts. It aims to:

1. Building trust and transparency.
2. Enhancing the company's image.
3. Improving communication with investors.
4. Attracting new investors.
5. Maintaining investor relations.
6. Ensuring regulatory compliance.

2.2.4 Corporate social responsibility (CSR)

In the past two decades, interest in sustainable investments has become evident, and the demand for corporate information about their activities and policies on social responsibility has increased (Xue , Chang , & Xu, 2023).

CSR can be referred to as actions that promote social benefits for companies beyond their own interests and it is the long-term maintenance of the company's systems in line with economic, social, and environmental considerations (Alhosani & Nobanee, 2023). According to Christensen, Hail, & Leuz (2021), corporate disclosure of social responsibility makes it easier for investors to evaluate corporate strategies and their ability to create long-term value, which can prevent financial risks when the built-in information flaws are mitigated.

According to Torea, Feijoo, & Cuesta (2019), the main elements of CSR include: voluntarism, strategic integration, ensuring the alignment of values and practices, and transparency and accountability.

Volunteering, which refers to companies going beyond legal requirements to serve the community while considering its interests and focusing stakeholders on impacting communities and the environment. Strategic integration, which involves integrating economic and social concerns into business strategies. Ensuring alignment of values and practices, integrating decision-making and corporate culture with corporate social responsibility. Transparency and accountability, represented by regular corporate reporting and open communication with the community (Torea, Feijoo, & Cuesta, 2019).

CSR has five main principles (sustainability, accountability, transparency, ethical behavior, and stakeholder engagement). Sustainability refers to the relentless pursuit of economic and social well-being in a long-term environment. Accountability is the company's responsibility for its actions and their impact. Transparency is based on complete clarity and effective availability of the company's efforts towards social responsibility and economic performance. Ethical behavior is based on honesty and integrity in the company's business practices. Stakeholder engagement refers to the company's consideration of the interests of all stakeholders, including communities, in its operations (Tamvada, 2020).

CSR has several main areas that can be summarized in four areas (Olanipekun, Omotayo, & Saka, 2021):

1. Environmental responsibility, represented by reducing the carbon footprint (a measure of the amount of gases emitted into the atmosphere resulting from various human activities, including corporate activities), moving towards the use of renewable energy (extracting energy from inexhaustible natural sources such as the sun, water, and wind), reducing waste (disposal of which is no longer needed or used), and engaging in sustainable sources (selecting suppliers based on integrating performance factors in all their forms).
2. Social responsibility, represented by ensuring fair business practices (following fair labor standards according to the International Labor Organization, and developing these practices in accordance with social dialogue and equality), promoting diversity and inclusion (implementing institutional cultural policies and programs to create a work environment that includes and represents a diverse and effective

workforce), supporting human rights (the universal rights inherent in individuals as human beings, regardless of their ethnic, racial, and social diversity), and responsibility towards local communities (building bonds of connection and trust with the local community through establishing volunteer programs and donating to charities and educational institutions).

3. Ethical Responsibility: Companies must maintain high ethical standards in all their business operations to ensure a good reputation, such as ensuring fair wages and salaries, maintaining safe working conditions, and adhering to global ethical labor standards and developing them to suit the communities they serve.
4. Economic Responsibility: In addition to companies' commitment to sustainable practices, they must actively contribute to economic development.

In general, CSR has several benefits: giving the company a competitive advantage, improving financial performance, reducing risks, increasing opportunities to attract capital, strengthening relationships with stakeholders, improving employee performance, and gaining their loyalty, enhancing the company's reputation, and enhancing its brand, which contributes to increasing customer engagement and loyalty (Christensen, Hail, & Leuz , 2021).

2.2.5 Definition of environmental disclosure

Since the UNCED in Rio de Janeiro, Brazil, in 1992, the concept of environmental disclosure has been highlighted and reporting has gained increased publicity around the world (Ohidoa, Omokhudu, & Oserogho, 2016).

In the past decades, the issue of environmental disclosure has received great attention from researchers, whether in professional conferences or in practical research, in response to the relentless demands for disclosure of environmental data and information and the impact of economic activities on the surrounding environment.

Mansour and Omari (2021) defined ED as " The process by which information on the environmental obligations resulting from the organization's exercise of these obligations is presented so that the various stakeholders can obtain the necessary information for planning, monitoring and performance evaluation".

Deegan (2002) defined ED as " A set of information items related to the performance and activities of environmental management of economic establishments and their financial implications in the past, present and future".

2.2.6 Key Aspects of Environmental Disclosure

According to Verawaty, Merina, Jaya, & Widianingsih (2020), ED has four main aspects:

1. Scope of information: resource use (energy, water, materials), waste management, pollution, and environmental governance and policies.
2. Target audience: employees, investors, customers, regulators, and the public.
3. Disclosure channels: annual reports, specialized environmental reports, sustainability reports, websites, and surveys of relevant organizations.
4. Growing interest: because of increased awareness of the importance of ED, tightening regulations, and investment in ESG governance standards. ED has many benefits (enhancing transparency and accountability, improving the company's relationship with stakeholders, improving, and developing risk management, attracting investors, enhancing reputation, increasing brand loyalty, enhancing efficiency and innovation, regulatory compliance with environmental reporting requirements, and improving access to finance).

2.2.7 Common areas of Environmental Disclosure

According to Verawaty, Merina, Jaya, & Widianingsih (2020), environmental disclosures typically vary depending on the reporting framework, company type, and business sector, but generally include ten areas:

1. Greenhouse gas (GHG) emissions: Scope 1 (direct), scope 2 (indirect), scope 3 (value chain emissions).
2. Energy consumption: Sources and total use.
3. Water use and management: withdrawals, consumption, and discharges.
4. Waste generation and management: Types, quantities, and disposal methods.
5. Resource use: consumption of natural resources and raw materials.
6. Biodiversity impacts: land use, deforestation, and conservation efforts.

7. Pollution and emissions to air, water, and land: Types and quantities of pollutants emitted.
8. Environmental policies and management systems: Strategies, targets, and certifications.
9. Environmental risks and opportunities: Water scarcity risks, climate-related risks, and clean technology opportunities.
10. Governance and management of environmental issues: Board oversight and management responsibilities.

2.2.8 Challenges of Environmental Disclosure

According to Aureli, Baldo, Lombardi, & Nappo (2020), the challenges facing ED can be summarized as follows:

- **Evolving Regulations**: Accelerating environmental challenges have forced international standards-setting committees to develop their standards to keep pace with these challenges. Moreover, new regulations, such as Securities and Exchange Commission (SEC) rules and the European Union's classification, have added further complexity to reporting. In response to these developments, companies are required to keep up with them by constantly reviewing and understanding them to adapt their reporting. This will place additional resources and regulatory changes on their shoulders.
- **Lack of standardization**: Despite the International Accounting Standards Board (IFRS)'s tireless efforts to establish global standards for environmental reporting to increase consistency and reduce differences among companies, there are currently no unified standards for environmental governance. Due to the lack of standardization, companies continue to exploit opportunities and practice environmental deception to appear more sustainable.
- **Data collection and Quality**: A company's data is not limited to internal activities, but rather comprises a consistent collection of data across its operations and supply chains. Therefore, one of the most significant challenges facing companies in preparing ESG reports is data collection, especially for those companies that lack recommended practices for preparing ESG reports or lack sustainable data management systems. Therefore, companies are moving towards improving data quality by adopting advanced software solutions in cooperation with some companies specialized in collecting and managing ESG data and preparing ESG

reports like Apiday. Recently, companies are moving towards integrated reporting (combining financial, social, environmental, and governance disclosures) to provide a comprehensive view of a company's performance and a clear picture of its overall strategy and impact.

- **Complexity and scope**: Companies find it difficult to determine the relative importance of information related to environmental issues because they are closely interconnected and therefore difficult to present effectively.
- **Environmental misinformation**: Some companies practice environmental misinformation by selectively disclosing positive environmental information and concealing its negative impacts.
- **Cost and Resources**: The real challenge for companies, especially small companies, is the high cost of preparing effective environmental reports.
- **Ensuring Relevance**: The complexity facing companies, especially small companies, when determining the significance of environmental issues related to their activities is one of the most significant challenges preventing the preparation of effective environmental reports.

2.2.9 Mandatory and Voluntary Environmental Disclosure

Mandatory disclosure (MD) is the disclosure of information required of companies under laws, accounting standards, and regulations to ensure transparency, protect investor rights, and ensure stability in financial markets. Voluntary disclosure (VD) is disclosure of information by companies that is not required by laws, accounting standards, or regulations to improve their reputation, attract capital, and strengthen relationships with stakeholders (Cui , Li, Xue, & Zhang, 2025).

Mandatory environmental disclosure (MED) can be defined as MD of a company's environmental performance information with the aim of ensuring corporate environmental transparency and accountability, as well as protecting the environment and assessing companies' environmental impacts. Voluntary environmental disclosure (VED) can also be defined as VD of a company's environmental performance information that is not tied to a legal or regulatory obligation (Cui , Li, Xue, & Zhang, 2025).

MD is a legal obligation, failure to comply with which entails penalties or fines. It has specific standards in terms of form, content, and timing. It aims to protect investors from being misled when making investment decisions and enhances corporate governance to ensure transparency and accountability in company management.VD is a company initiative (subject to the company's wishes), not subject to standardization (there are no uniform laws, standards, or regulations, but there are guidelines and frameworks such as GRI Sustainability Reports), aims to maximize value and enhance reputation (building trust and improving the company's public image, attracting investors, and achieving competitive advantage), and is closely linked to corporate social responsibility and sustainability (companies' commitment to ESG).

Below is a breakdown of the differences between MD and VD:

1. Content:

a- MD: Basic financial and non-financial information.

b- VD: Additional non-financial information.

2. Properties:

a- MD: Legal obligation, with specific standards.

b- VD: Initiatives, without specific standards.

3. Goals:

a- MD: Transparency, investor protection, enhancing governance, and financial stability.

b- VD: Building trust, improving reputation, enhancing value, attracting investment, and excellence.

4. Regulators:

a- MD: Governments, IASB, FASB, SEC.

b- VD: Corporations, GRI, TCFD.

5. Non-compliance:

a- MD: Legal penalties.

b- VD: Loss of trust, declining reputation.

6. Examples:

a- MD: Financial reports, Auditors reports, essential event Information, ownership structure and management structure.

b- VD: Sustainability reports, CSR, ESG, Research and Development Information, strategic plans, and human capital disclosures.

Below is a breakdown of the differences between MED and VED:

1. Content:

a- MED: Basic non-financial information.

b- VED: Additional non-financial information.

2. Properties:

a- MED: Legal obligation, with specific standards.

b- VED: Initiatives, without specific standards.

3. Goals:

a- MED: Environmental protection, accountability and transparency, risk mitigation, information provision to investors, policy formulation support, and fair competition.

b- VED: Enhance reputation, improve brand, attract sustainable investments, improve stakeholder relations, manage risk, reduce the cost of capital, and prepare for future regulations.

4. Regulators:

a- MED: IASB, FASB, SEC, ISSD, CSRD, ESRS and TCFD.

b- VED: GRI, CDP, SASB, and TCFD.

5. Non-compliance:

a- MED: Legal penalties.

b- VED: Loss of trust, declining reputation.

6. Examples:

a- MED: GHG emissions (scopes 1 and 2), energy consumption, water consumption and management, waste generation and management, pollutant emissions, hazardous materials use and management, environmental compliance, environmental permits, and environmental licenses.

b- VED: Environmental sustainability goals, investments in green technologies, circular economy initiatives, product life cycle assessments, community engagement, environmental certifications and standards, and supply chain transparency.

2.2.10 Objectives of environmental disclosure

Internal objectives

1. Maintaining the competitive position of the organization
2. The contribution of the organization's management to reach sufficient conviction regarding the safety of operations and the efficiency of environmental protection measures.
3. Providing a database for evaluating environmental safety procedures and the size of the environmental costs incurred by the organization.... (Abu-Stalah, 2022).

External objectives

1. Demonstrate the organization's commitment to social responsibility requirements.
2. Gain consumer satisfaction and conviction in the organization's goods and services.
3. A means to manage the negotiation between owners of property rights and others.
4. It helps its users to make planning, control, and performance evaluation decisions.... (Abu-Stalah, 2022).

2.3 Audit Committee (AC)

2.3.1 History of AC

The concept of AC emerged in the United States because of the financial disasters caused by the manipulation of FR. In response, the Securities and Exchange Commission (SEC) and the New York Stock Exchange (NYSE) made an important recommendation: the formation of a committee within each company composed of members who do not serve within the company's executive management. Its primary mission is to appoint external auditors and define their duties, with the aim of increasing independence when expressing an opinion on the fairness of the company's FR. In 1967, the American Institute of Certified Public Accountants (AICPA) suggested that listed companies establish an AC responsible for resolving accounting and FR disputes between the external auditor and the company's management. In 1972, SEC recommended that AC be composed of non-executive board members in publicly traded companies. In 1978, NYSE issued a decision requiring all US-listed companies to establish an AC composed of external board members under certain conditions (non-executive directors who have no financial or family relationships with an executive director or employee). In 1992, the idea of an AC was approved in Britain and gained rapid popularity. In 2002, the Sarbanes-Oxley Act was passed by the US Congress. To strengthen the role of the audit committee, the law required audit committees to be completely independent from management, and to have at least one financial expert among their members. The Sarbanes Act granted the audit committee the authority to appoint external auditors and monitor their work, and provided the committee with many external resources, such as financial and legal advisors (Baxter & Cotter, 2009).

2.3.2 Definition of the audit committee

AC is an operational committee composed of the company's board members; its responsibility includes overseeing and disclose the company's financial reports (FR) (Choi, Lee, & Park, 2013). AC is defined as a subcommittee emanating from the Board of Directors, it is independent from the company's other departments, usually composed of independent, non-executive members of the Board of Directors, and the main purpose of its formation is supervision and oversight (Ashari & Krismiaji, 2019).

We can define AC as a fundamental element of corporate governance that helps oversee and monitor management practices to protect the interests of shareholders.

2.3.3 Audit committee responsibilities

According to Mnif & Tahari (2022), AD has three responsibilities are shown below:

1. Internal Auditor Jobs:

a- Examining the effectiveness of the internal control system (putting the internal control system under the microscope).

b- Examining the objectives and plans of the internal audit department.

c- Reviewing internal audit resources and evaluating their efficiency.

d- When errors are discovered resulting from the internal auditor's work, the internal auditor should be discussed with the negative aspects of the work and advised to avoid them in the future.

2. External Auditor Jobs:

a- Identify the problems faced by auditors during the audit process and discuss ways to eliminate and reduce them.

b- Discussing auditors' recommendations, observations, and comments on internal control systems.

c- Discussing the auditors’ opinions and recommendations regarding the internal control system.

d- Study and discuss the factors affecting the independence of external auditors to reduce and eliminate them in the future.

3. Annual Reports Jobs:

a- Reviewing policies, procedures, and the most important changes that occurred in the financial statements during the financial year.

b- Review the company's financial reports.

AC follows a set of procedures to perform its functions more effectively, which Ahmed identified as follows (Husted & Sousa-Filho, 2019):

1. Providing the necessary data and information.

2. Continuous and effective communication with the Internal AC and external auditors.

3. Defining the objectives and duties of AC.

4. Defining specializations and selecting competencies when selecting AC members, which will ensure the independence and continuity of its members.

2.3.4 Functions of audit committee

In general, the functions of the Audit Committee are divided into primary and secondary functions (Mnif & Tahari, 2022; Li, Mangena, & Pike, 2012; Abbott, Parker, & Peters, 2004).

Basic functions of AC

1. Supervising of preparation FR: The essence work of AC, AC carefully reviews the periodic FR (annual and quarterly) before they are published. It aims to:

a- Ensure that FS are prepared based on the applicable accounting standards (IFRS, GAAP).

b- Ensure that FS reflect a true and fair picture of the company's performance and financial position.

c- Ensure that FS include the necessary and complete disclosures.

d- AD discusses with management and auditors (accounting policies, significant accounting estimates, and amendments to accounting principles).

2. Supervising the external audit function: Ensuring the transparency, independence, and quality of external auditing. It aims to:

a- Appointment and dismissal of the external auditor.

b- Determine the external auditor's fees.

c- Periodically evaluate the independence and competence of the external auditor.

d- Review the scope and plan of the external audit to ensure that the plan covers all significant aspects.

e- Discuss the results of the external audit.

3. Supervising the internal audit function: Ensuring the effectiveness of internal auditing and achieving its objectives, providing it with the necessary resources, and ensuring that the internal auditor complies with professional standards and practices. It aims to:

a- Review and develop the internal audit charter to ensure clarity and consistency in internal audit responsibilities.

b- Supervising the appointment or dismissal of the head of internal audit, to ensure his independence from executive management.

c- Review and approve the annual internal audit plan.

d- Review internal audit reports and follow up on their recommendations.

e- Evaluate the efficiency of internal audit and ensure that it is operating effectively.

4. Supervising internal control systems: The first line of defense to protect the company from operational errors and fraud. Ensuring the integrity of operational processes and financial data, assessing compliance with laws and regulations, and supervising internal and external audit functions. It aims to:

a- Evaluation of the effectiveness of internal control.

b- Identifying weaknesses in internal control and ensuring addressed by management.

c- Overseeing the company's control environment to promote compliance and ensure ethical practices.

5. Overseeing risk management: Identify operational, financial and compliance risks. It aims to:

a- Ensure that an effective risk management system that (identifies, assesses and addresses) risks that are likely to affect the company.

b- Highlighting the material risks affecting the company's financial position and environmental risk.

6. Ensuring compliance with laws, standards, and regulations: Supervising the company's compliance with all legal, regulatory and governance requirements. It aims to:

a- Compliance with laws and regulations, including corporate and securities laws.

b- Overseeing business ethics policies, anti-corruption, and bribery policies, and implementing the Code of Ethical Conduct.

c- Supervising secure risk reporting channels to allow employees to submit complaints regarding financial violations and ethical transgressions.

2.3.4.1 Secondary functions of AC

1. **Risk Function Oversight**: Specialized and support committees for consultations related to risk management. It aims to:

a- Establish specialized committees to supervise the risk management unit and monitor the Executive Director of Risk.

b- Review of risk management staff.

c- Adequacy of resources allocated to risk management staff.

d- Alignment and alignment of the annual work plan with the risk management unit

2. **Compliance Function Oversight**: Ensuring the transparency, independence, and quality of external auditing. It aims to:

a- Compliance with anti-money laundering policies.

b- Compliance with counter-terrorist financing policies.

c- Compliance with data protection policies and laws.

d- Compliance with industry-specific regulations.

e- In the banking sector (heavy regulation), compliance programs must be periodically reviewed and effectively evaluated.

3. **Executive Management Financial Performance Evaluation**: Ensuring the effectiveness of internal auditing and achieving its objectives, providing it with the necessary resources, and ensuring that the internal auditor complies with professional standards and practices. It aims to:

a- Evaluating the accuracy of the evaluation criteria used to assess management performance and award them rewards.

b- Reviewing the transparency of disclosures about bonuses and compensation for members of various departments.

4. **Supervising the financial and technological techniques used**: Using technology in traditional financial services. It aims to:

a- Overseeing information security risks and cybercrime risks.

b- Review the effectiveness of controls used to regulate information and information technology.

5. **Overseeing whistleblower policies**: Supervising non-financial data and information related to the company's operations. It aims to:

a- Ensure safe channels for reporting violations.

b- Protect whistleblowers from retaliation.

c- Investigate complaints.

d- Encourage reporting.

e- Build integrity and trust within the company.

f- Define procedures for reporting violations.

6. **Supervising non-financial disclosures and sustainability reports**: Supervising non-financial data and information related to the company's operations. It aims to:

a- Reviewing Sustainability data.

b- Reviewing CSR and ESG.

c- Reviewing Ethical code.

7. **Reviewing related party transactions**: Related party transactions with extreme care to protect it from conflicts of interest or fraud. It aims to:

a- Review transactions to ensure conflicts of interest are avoided.

b- Review company policies related to related party transactions to ensure transparency.

2.3.5 Characteristics of the audit committee

The growing need for high-quality accounting information has made it increasingly necessary for companies to establish AC with efficient characteristics that enhance the credibility of financial information and increase the effectiveness of internal control (Ashari & Krismiaji, 2019).

There are nine general characteristics of AC (independence, financial expertise, accounting expertise, appropriate size, diligence, diversity, effective communication, authority, and a sense of responsibility). Our research will address four of these characteristics: (financial expertise ACFEX, independence ACIND, frequent meetings ACME, and size ACSIZ).

Audit Committee Financial Expertise (ACFEX): The need to have academically qualified members with sufficient practical experience in AC arose in response to the complexity of financial instruments, capital structure, and the emergence of new industries, as well as the international trend towards unified financial reporting standards (Abu-Alhaija & Al-Hayek, 2012). Abbott, Parker, and Peters (2004), supported this by saying that AC needs a financial expert among its members to understand financial issues and prepare FR. According to Velte (2018), the individual experience of the members of AC improves its efficiency and effective monitoring.

Audit Committee Independence (ACIND): The company's owners and other stakeholders need accurate FR that enable them to make the right economic decisions, AT shows conflicts of interest between management and stakeholders, it is possible for stakeholders to be misled by management. According to Bronson, Carcello, Hollingsworth, & Neal (2009), one of the main characteristics of AC that positively affects its ability to oversight, and control is its independence. (Baxter & Cotter, 2009), emphasized that ACIND is the main positive influence on the process of preparing FR. ACIND is expected to create an important and pivotal role in preparing FR, auditing, and good CG (Pozzoli, Pagani, & Paolone, 2022).

According to Zgarni, Hlioui, & Zehri (2016), the entity's FR will be more reliable when AC is independent. ACIND ensures the quality, transparency of financial information, improves it by reducing the leakage of reported information, ensuring the efficient supervisory performance of AC members, reducing the opportunistic behavior of managers, and thus improving the company's performance (Ashari & Krismiaji, 2019).

Audit Committee Meetings (ACME): AC must hold periodic meetings as stipulated in the legislation and laws to discuss the company’s affairs and the progress of its operations, and the number of meetings must not be less than four meetings annually (Abu-Alhaija & Al-Hayek, 2012). According to Jean, Marrakchi, and Lucie (2004), increasing the number of ACM will preserve its oversight function. To ensure the integrity and timeliness of FRs, AC should hold regular meetings (Stewart & Munro, 2007).

Audit Committee Size (ACSIZ): Based on RTD, the largest AC will effectively implement its responsibilities by allocating its resources, and the largest AC can lead to higher levels of transparency and disclosure. And according to AT, there is an inverse relationship between ACS and administrative opportunism, thus, as ACS increases, the cost of the agency will decrease (Mnif & Tahari, 2022). According to Alotaibi & Hussainey (2016), the larger AC will have sufficient resources leading to a higher quality of monitoring and supervision.

2.4 Related Theories

2.4.1 Agency Theory

According to Safriliana, Subroto, Subekti, & Rahman (2018), in general, the field of auditing in accounting science is the discipline that AT overlooks, but there are many studies, especially recent studies that used AT in its theoretical basis, he also added; "for explaining the need for auditors as a bridge between the interests of agents and principals".

AT explains the relationship that arises between the agent and the principal according to the contract concluded between them, so that the agent performs the tasks and interests of the principal, and accordingly, the difference in interest between the agent represented by the management of the facility and the principal represented by the owner of the capital would occur when implementing the agency relationship (Melzatia, Badaruddin, & Hammat, 2019).

The manager, as the owner of the capital, gives the agent the confidence to manage the company's assets. Therefore, the agent must submit periodic reports on the development of the company. Despite this, the relationship between the principal (owners) and the agent (management) in the company's operational activities achieves a conflict, and based on this conflict, it is necessary to have a third party represented by the independent external auditor, to reduce this conflict and try to prevent it (Chari, David, Duru, & Zhao, 2019).

The mechanisms of good CG would act as a bridge to increase trust between agents and clients, because of which agents would not commit any fraud for their personal interests (Solomon, Bendickson, Marvel, McDowell, & Mahtoe, 2021).

According to Appuhami & Tashakor (2017), having an effective AC will reduce agency costs and enhance the quality of disclosure.

2.4.2 Shareholder Theory

SHT is an economic view that says that the sole duty of corporations is to maximize the profits accumulated for their shareholders (Ho, Huang, & Karuna, 2020).

Therefore, it is imperative for managers under SHT to abide by a professional and ethical duty towards shareholders to generate great value for them.

The study of shareholder activity spans more than a century, to trace the paths of increasing influences by shareholders on company managers, with the aim of improving the financial performance of companies (Denes, Karpoff, & McWilliams, 2017).

With the beginning of the twenty-first century, the activity of the shareholders began to give an important space of priority to the social and environmental performance. Also social, and environmental performance priorities are widely presented in the press with the aim of raising awareness of future generations of global sustainability challenges (Cundill, Smart, & Wilson, 2017).

Typically, major shareholders write binding bilateral contracts for companies that specify the information rights under which the shareholder has the right to receive specific information from management. Based on these contracts, the company's performance will improve, but disclosure in general will decrease (Nagar & Schoenfeld, 2021).

2.4.3 Stakeholder Theory

Jinyoung Im, Yeasun K. Chung and Dazhi (Daisy) Qin (2022) define stakeholder as: “Any group or individual who can affect or is affected by the achievement of the firm’s objectives”.

According to (Khazaei, Elliot, & Joppe, 2015; Rhou & Singal, 2020), a stakeholder approach is followed in research on topics that require a common understanding and collective effort among organizations with different interests, such as sustainable development, CSR, and crisis recovery (Canhoto & Wei, 2021).

ST relates to business issues, value creation, social responsibility, and capitalist ethics. It is based on any person (third party) who influences or is affected by the procedures or policies followed by the company. Thus, ST is unlike AT, which is based on only one party, the shareholder, and with its fold's separates between ethics and business. On the other hand, we can say ST works to create a dependency relationship between it and ethics and integrated business, because of which it begins to create value in the medium and long term (Beck & Storopoli, 2021).

According to Tantalo and Priem (2014), organizations must emphasize value creation for stakeholders, which is the direction of management to stakeholders. This would be inspiring, creating a sustainable competitive advantage for the organization, and improving the relationship between the organization and its stakeholders.

2.4.4 Legitimacy theory

Suchman (1995) defines LT as: ''A generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions". Based on that, LT explains the success and going concern of the company, requiring managers to carry out their work within the company as expected by society and all relevant parties.

According to Hummel & Schlick (2016), the company will be at risk in the long run if its legitimacy is threatened by stakeholders who are convinced that the company's performance is unsustainable, and this may arise from several factors, the most important of which are: customer dissatisfaction, strict regulation, litigation and employment issues. Accordingly, companies with poor performance in a specific performance indicator tend to low-quality information that is not easily comparable, to hide their bad situation while maintaining their legitimacy to create an appropriate sustainability image for them.

To ensure the legitimacy of the company that is exposed to risk by stakeholders, companies prepare integrated FR and overlapping aspects of disclosure extensively, to report on social and environmental sustainability. From the perspective of LT, integrated reporting is a discretionary disclosure option at the present time, which management uses to hide its voluntary philosophy in adapting its reporting practices between financial accountability by the company's investors and rhetorical legality, and this fully applies to social and environmental sustainability reports (Nishitani et al., 2021).

2.4.5 Resource dependence theory

RDT relies on the concept that any organization, or company, must share with other actors (partners) in its transactions to obtain resources (Román, Zorio-Grima , & Merello, 2021).

The resource-based development (RBD) model may have an impact on the carbon emissions of resource-based cities. Resource-based industries resulted from the diversion of labor and capital factors from industries and manufacturing due to the prevention of available and abundant natural resources from the development of industrialization and the resulting technological repercussions (Shao & Yang, 2014). And RBD model limits investment levels in human capital (Sun, Sun, Geng, Yang, & Edziah, 2019). And the higher profits generated by the resource industries can lead to corporate rent-seeking political behavior (Zallé, 2019).

Recently, cities that depend on resources all over the world are adopting the idea of gradual liberation from dependence on resources, as well as working on the sustainability of their social and environmental development, and this has made them more capable of controlling pollution and improving their environmental quality (Zheng & Ge, 2022).

RDT provides a broad and comprehensive definition of resources (e.g., raw materials, human resources, cash, and political support), from their potential sources (customers, suppliers, competitors, and government agencies), which in turn meet the diverse needs of stakeholders and diverse cash flows to them (Craighead, Jr, & Darby, 2020).

In general, there are two strategies for RDT (Buffering and bridging), where the buffering strategy aims to reduce relationships with partners to mitigate any potential disruptions resulting from them, while the bridges strategy aims to establish strong relationships with the partner to protect the company from supply chain disruptions (Mishra, Sharma, Kumar, & Dubey, 2016; Bode, Wagner, Petersen, & Ellram, 2011).

2.5 Hypotheses development

2.5.1 Introduction

In this part We will present many previous studies that talked about the relationship between the characteristics of the audit committee and environmental disclosure, and we will develop and build the hypotheses of the study.

2.5.2 Audit Committee Financial Expertise and Environmental Disclosure

According to Shaukat, Qiu, & Trojanowski (2016), ACFEX can support the assessment of financial and regulatory risks of CSR, so, companies will achieve higher environmental performance. Bédard & Gendron (2010), emphasized that AC combined with financial expertise will improve the transparency of company disclosures. Helfaya & Moussa (2017), asserted that ACFEX would improve disclosure levels of ESG.

In contrast, according to Li, Mangena, & Pike (2012), the correlation between ACFEX and the quality of non-financial disclosure is largely negative. Appuhami & Tashakor (2017), found that the relationship between ACFEX and ESG disclosure is not significant.

Based on the above discussion, the following hypothesis is formulated:

H1: There is a positive and significant impact of audit committee financial expertise (ACFEX) on environmental disclosure (ED).

2.5.3 Audit Committee Independence and Environmental Disclosure

According to Arif, Sajjad, Farooq, Abrar, & Joyo (2021), ACIND has a significant positive impact on the level of compliance with GRI guidelines, and this indicates the positive impact on the quality of ESG reports and the quantity of their disclosures. Raimo, Vitolla, Marrone, & Rubino (2020), provide clear evidence that ACIND increases the quality of integrated reporting. According to Buallay & Al-Ajmi (2020), ACIND positively affects ESG disclosure. Appuhami & Tashakor (2017), added that ACIND enhances the disclosure of ESG. According to Haque (2017), ACIND have positive correlation with greenhouse gases (GHGs) disclosure. Finally, Broadstock, Chan, Cheng, & Wang (2021), emphasized that the relationship between auditor independence and ESG performance is positive.

Although most studies confirmed the existence of a positive relationship between ACIND and the disclosure of ESG, there are studies that contradict this. According to Mallin, Michelon, and Raggi (2013), the presence of independent directors on AC has a negative impact on ESG. Haniffa & Cooke (2005), found that ACIND negatively affects the disclosure of ESG.

Based on the above discussion, the following hypothesis is formulated:

H2: There is a positive and significant impact of audit committee independence (ACIND) on environmental disclosure (ED).

2.5.4 Audit Committee Meetings and Environmental Disclosure

According to Lisic, Neal, Zhang, & Zhang (2015), to maintain the quality of sustainability disclosures, AC must meet frequently. According to Samaha, Khlif, & Hussainey (2015), the effectiveness of AC in holding its meetings has a significant impact on disclosure levels. Li, Mangena, & Pike (2012), found that increasing the number of ACME will increase the quality of the FR and will increase voluntary disclosure. The frequency of ACME positively determines the extent of disclosures and had a significant effect on CSR (Mohammadi, Saeidi, & Naghshbandi, 2021). Musallam (2018) found a strong positive relationship between ACME and CSR disclosure. However, Sultana, Singh, and Van der Zahn (2014), investigated the impact of ACs' attributes, including meeting frequency, on the timeliness of FR of Australian firms. Their results offer little support to the negative impact of meeting frequency on the reporting lag. For performing their responsibilities in a better way, banks regulators require ACs to meet at least four times year to review the seasonal and annual reports before they are reviewed by the boards and made public. On the contrary, (Sultana, Singh, & Van der Zahn, 2014), found little support for the adverse effect of ACME with delayed financial reporting.

Based on the above discussion, the following hypothesis is formulated:

H3: There is a positive and significant impact of Audit committee meetings (ACME) on environmental disclosure (ED)

2.5.5 Audit Committee Size and Environmental Disclosure

Appuhami & Tashakor (2017), regarded that the large size of AC will be more effective as it will lead to a diversity of knowledge and expertise, and this in turn will create better control mechanisms that will affect ESG disclosure of companies. Abdullah, Percy, & Stewart (2015) found a positive correlation between ACSIZ and CG disclosure in Gulf Cooperation Council (GCC) and the Southeast Asian. According to Madi, Ishak, & Abdul Manaf (2014), ACSIZ is positively related to the voluntary disclosure of companies. According to Haque, 2017; Liao, Luo, & Tang, 2015), ACSIZ have positive correlation with GHG disclosure. According to Adel, Hussain, Mohamed, & Basuony (2019), ACSIZ have a positive effect on the quality of CSR reporting. According to Dias, Rodrigues, & Craig (2017), ACSIZ have a positive significant effect on CSR disclosure. Musallam (2018) and Appuhami & Tashakor (2017), found a significant positive relationship between ACSIZ and CSR disclosure.

Based on the above discussion, the following hypothesis is formulated:

H4: There is a positive and significant impact of audit committee size (ACSIZ) on environmental disclosure (ED).

Chapter Three

Research Methodology

3.1 Introduction

In this chapter, will discuss the study population, its sample, the method of collecting sample data, the study variables and the purpose of each variable and its measurement methods, which will help us in disentangling the characteristics of the audit committee and the environmental disclosure. Then, address the study model.

In this study we employ panel regression analysis to test the impact of audit committee characteristics on environmental disclosure. To achieve this objective, the data will be analyzed using STATA software version. the main statistical method used in this study are descriptive analysis, correlation matrix is used to show the correlation coefficient between variables Regression analysis is used to examine the direction and strength of the relationship between independent variables and dependent variables.

3.2 Data Collection

For the variables of the study, data were collected from different sources and at different stages. Characteristics of AC and Environmental disclosure data were collected from Bloomberg and Thomson Reuters Eikon databases, while other financial data were collected from DataStream and World domain databases.

3.3 Population and Sample

This study relied on a sample of European companies listed on the STOXX Europe 600 index during the period 2012 to 2018. The reason for choosing European countries is because they are the countries most interested in environmental issues, in addition to containing European companies that CSR reports represent more than half of the reports issued by CSR (Dwekat, Meqbel, Seguí-Mas, & Tormo-Carbó, 2022).

STOXX Europe 600 Index was designed by STOXX Ltd and introduced in 1998, which contains 600 stocks as a fixed number of the index. These stocks represent small, medium, and large companies from 17 European countries, covering nearly 90% of the free float. The United Kingdom took the lion's share of representation in the STOXX Europe 600 index by 22.3% with 134 stocks, France came in second place with about

16.6% with 100 stocks, and Switzerland came in third place with about 14.9% with 89 stocks. Germany ranked fourth with about 14.1% with 84 stocks. Austria, Belgium, Finland, Denmark, Ireland, the Netherlands, Norway, Poland, Italy, Luxembourg, Portugal, Spain, and Sweden represented about 32.1% of the index with 193 stocks. It is worth noting that the STOXX Europe 600 index is available in seven currencies (EUR, GBP, AUD, CAD, CHF, JPY, USD) (Dwekat, Mas, Carbó, & Carmona, 2020).

The description of the data that we will rely on in the analysis is historical data relating to the period 2012 to 2018, supported by the percentages shown above and shown in tables (1) and (2).

Table (1)

Study sample according to country

Country	Number of companies	Ratio
United Kingdom	114	15.90%
France	103	14.37%
Germany	91	12.69%
Switzerland	59	8.23%
Netherlands	40	5.58%
Italy	39	5.44%
Spain	37	5.16%
Sweden	36	5.02%
Denmark	30	4.18%
Belgium	29	4.04%
Finland	27	3.77%
Austria	26	3.63%
Norway	21	2.93%
Portugal	16	2.23%
Ireland	15	2.09%
Czech Republic	12	1.67%
Poland	12	1.67%
Hungary	10	1.39%
Total	717	100.00%

Prepared by the researcher.

Table (2)

Study sample according to industry

Industry	Number of companies	Ratio
Financials	106	17.67%
Industrials	105	17.50%
Consumer discretionary	104	17.33%
Consumer staples	97	16.17%
Technology	92	15.33%
Utilities	96	16.00%
Total	600	100.00%

Prepared by the researcher.

The updated data will be presented in tables 3, 4, 5 and 6 according to the latest update of STOXX Europe 600 index (STOXX Europe 600, 2023). It should be noted that the updated data will not be used in the analysis later, as the data is limited to the independent variables, and the data on the independent variable cannot be accessed.

The UK retained the lion's share of representation in the STOXX Europe 600 index by 23% with 138 stocks, France came in second place with about 13.33% with 80 stocks, and Germany came in third place with about 11.83% with 71 stocks. Sweden ranked fourth with about 10% with 60 stocks. Switzerland, Italy, Netherlands, Spain, Denmark, Finland, Belgium, Ireland, the, Norway, Poland, Austria, and Portugal represented about 41.84% of the index with 251 stocks. While Luxembourg's dropped out of the index.

Table (3)

Study sample according to country (Big 5)

Country	Number of companies	Market Value (M. EUR)	Weight (%)	Ratio
United Kingdom	138	1,629.45	28.34%	23%
France	80	1,117.99	19.45%	13.33%
Germany	71	773.88	13.46%	11.83%
Sweden	60	26.17	0.46%	10.00%
Switzerland	55	938.51	16.33%	9.17%
Total	404	4,486	78.04%	67.33%

Prepared by the researcher.

Table (4)

Study sample according to country (Others)

Country	Number of companies	Market Value (M. EUR)	Weight (%)	Ratio
Italy	34	252.07	4.39%	5.67%
Netherlands	30	433.9	7.55%	5.00%
Spain	25	245.17	4.27%	4.17%
Denmark	25	40.47	0.70%	4.17%
Finland	18	108.48	1.89%	3.00%
Belgium	17	90.25	1.57%	2.83%
Norway	17	5.83	0.10%	2.83%
Poland	10	7.02	0.12%	1.67%
Austria	8	24.37	0.42%	1.33%
Ireland	7	36.64	0.64%	1.17%
Portugal	5	17.87	0.31%	0.83%
Total	196	1,262.05	21.96%	32.67%

Table (5)

Study sample according to the sector

Sector	Number of Companies	Market Value (M. EUR)	Weight (%)	Ratio
Industrials	123	887.83	15.45%	20.50%
Financials	114	1,071.34	18.64%	19.00%
Consumer Discretionary	69	623.17	10.84%	11.50%
Materials	54	407.26	7.09%	9.00%
Health Care	51	773.28	13.45%	8.50%
Consumer Staples	48	608.23	10.58%	8.00%
Utilities	32	250.12	4.35%	5.33%
Communication	32	303.13	5.27%	5.33%
Real Estate	30	76.70	1.33%	5.00%
Information Technology	29	460.39	8.01%	4.83%
Energy	18	286.6	4.99%	3.00%
Total	600	5,748.05	100%	100%

Table (6)

Study sample according to market value

Market Value	Number of Companies	Market Value (M.EUR)	Weight (%)	Ratio
Over 100M EUR	7	962.89	16.75%	1.17%
Between 50-100M EUR	15	1,010.81	17.59%	2.5%
Between 10-50M EUR	111	2,450.5	42.63%	18.50%
Between 1-10M EUR	363	1,290.24	22.45%	60.50%
Under 1M EUR	104	33.61	0.58%	17.33%
Total	**600**	**5,748.05**	**100%**	**100%**

Prepared by the researcher.

3.4 Variable Measurement

3.4.1 Dependent variable (Environmental disclosure ED)

ED is a proxy for the number of environmental disclosures. It can be measured in different ways, continuous or dummy variable as it collected from its sources. It includes 900 data points across a variety of ESG indicators such as GHG emission, water and energy conservation and shareholder rights. In this study measured by the disclosure index that is reported by the (Bloomberg ESG) database, and it is an indicator that shows the amount of companies' disclosure of their ESG-related information referred to as ESG_Score, where ESG_Score range from 100 to 0, Where 100 indicates the highest degree of disclosure, while 0 indicates the lowest degree of disclosure (Arif et al., 2021; Buallay & Al-Ajmi, 2020).

3.4.2 Independent variable (audit committee characteristics)

AC ensures the transparency and credibility of the company's activities; thus, it is one of the most important governance mechanisms (Appuhami & Tashakor, 2017). In this study, we chose four characteristics of AC, which are: ACFEX, ACIND, ACME, and ACSIZ.

- **ACFEX**: Is a proxy for AC expertise, a dummy variable, is given 1 if at least one member of AC has a "financial expert" within the meaning of Sarbanes-Oxley., and 0 otherwise (Uyar et al., 2022).

- **ACIND**: Is a proxy for the independence of AC; calculated as a percentage of the independent members of AC (Pozzoli et al., 2022).
- **ACME**: Is the proxy to AC meetings, which is the number of AC meetings frequency through the year (Buallay & Al-Ajmi, 2020).
- **ACSIZ**: Is the proxy to AC members, which is the total number of members serving in AC (Mohammadi, Saeidi, & Naghshbandi, 2021).

3.4.3 Control variable

According to previous studies, to isolate the association between AC characteristics and ED, we use three control variables, which are: Firm size (LnTa), leverage (LEV), return on assets (ROE) (Pitenoei, Gerayli, & Khozein, 2022; Uyar, Elbardan, Kuzey, & Karaman, 2022; Agustina & Sudibyo, 2022; Mohammadi, Saeidi, & Naghshbandi, 2021).

LnTa is the proxy for firm size; calculated as the natural logarithm of total assets (Uyar, Elbardan, Kuzey, & Karaman, 2022). LnTa was used as a measure of firm size for three main reasons:

1- To represent the firm's size, scope of operations, and potential profit-generating capacity.
2- To facilitate the application of regression analysis and statistical modeling, particularly in this research, given the variability in firm sizes.
3- To improve data stability.

LEV is the proxy for company solvency; calculated as total debts divided by total assets (Pitenoei, Gerayli, & Khozein, 2022). LEV was used as a measure of firm solvency for three main reasons (Comprehensiveness, Risk Measurement, and Standardization).

ROE is the proxy for firm’s profitability; calculated as net income divided by total assets (Mohammadi, Saeidi, & Naghshbandi, 2021). ROE was used as a measure of firm’s profitability for two main reasons (A performance measure from the owners' perspective, directly related to net profit).

Table (7) shows the study variables (Dependent, Independent, Control).

Table (7)

Measurement the study variables

Variables	Label	Operation Definition
Dependent Variable		
Environmental disclosure	ED	ED in measured by the disclosure index of the (Bloomberg ESG) database. Where 100 indicates the highest degree of disclosure, while 0 indicates the lowest degree of disclosure (Arif et al., 2021; Buallay & Al-Ajmi, 2020).
Independent Variables		
Audit committee financial expertise	ACFEX	ACFEX a dummy variable, is given 1 if at least one member of AC has a "financial expert" within the meaning of Sarbanes-Oxley., and 0 otherwise (Uyar, Elbardan, Kuzey, & Karaman, 2022; Dwekat, Seguí-Mas, Tormo-Carbó, & Carmona, 2020).
Audit committee Independence	ACIND	ACIND is measured as a percentage of the independent members of AC (Pozzoli et al., 2022; Uyar et al., 2022).
Audit committee meetings	ACME	ACME is the number of AC meetings frequency through the year (Dwekat et al., 2020).
Audit committee size	ACSIZ	ACSIZ is the total number of members serving in the committee (Mohammadi et al., 2021).
Control Variables		
Firm size	LnTa	LnTa is calculated as the natural logarithm of total assets (Agustina & Sudibyo, 2022).
Leverage	LEV	LEV is calculated as total debts divided by total assets (Uyar et al., 2022).
Return on Equity	ROE	ROE is calculated as net income divided by total assets (Agustina & Sudibyo, 2022)

Prepared by the researcher.

3.5 Data analysis and procedures

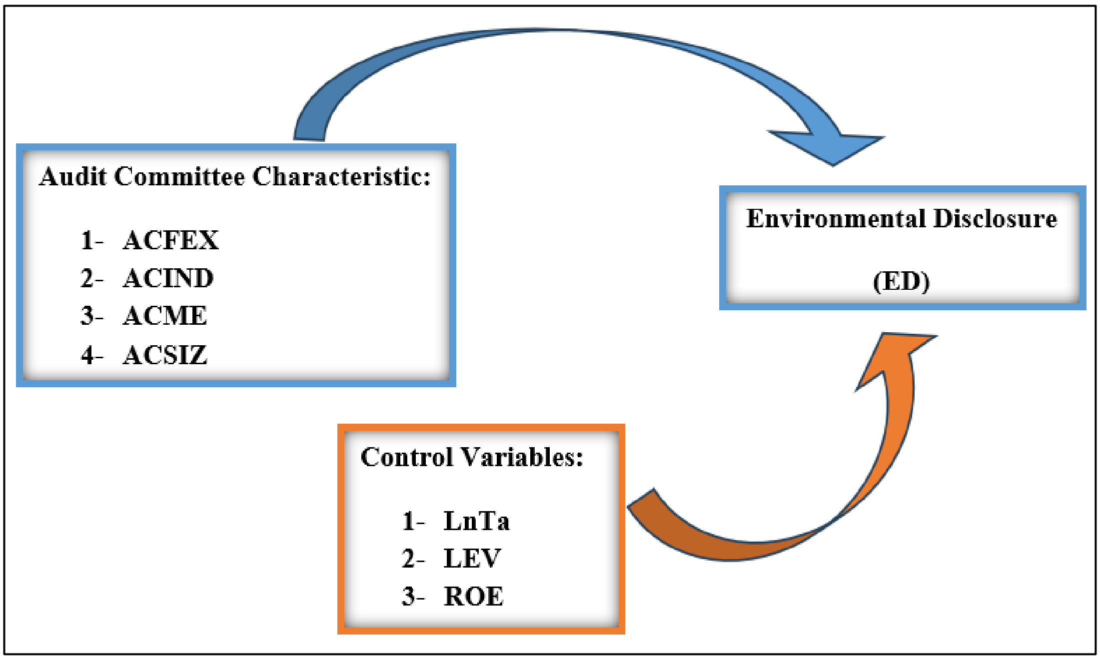
In this study we employ panel regression analysis to test the impact of audit committee characteristics on environmental disclosure. To achieve this objective, the data will be analyzed using STATA software version. the main statistical method used in this study are descriptive analysis, correlation matrix is used to show the correlation coefficient between variables Regression analysis is used to examine the direction and strength of the relationship between independent variables and dependent variables.

3.6 Study model

Model 1incorporates only the audit committee variables including ACFEX, ACIND, ACME, and ACSIZ. Model 2 includes all audit committee variables as well as additional control variables (LnTA, LEV, and ROE).

Figure (1)

Study model



According to Dwekat, Meqbel, Seguí-Mas, and Tormo-Carbó (2022) and Román, Zorio-Grima, and Merello (2021), to test the hypotheses of study, the researcher used the logical regression two models as shown below:

Model 1:

$$\mathbf{ED_i = \beta_0 + \beta_1\, ACFEX_{it} + \beta_2\, ACIND_{it} + \beta_3\, ACME_{it} + \beta_4\, ACSIZ_{it} + \varepsilon_{it}} \quad \ldots\ldots\ldots\ldots\ldots \mathbf{(1)}$$

Model 2:

$$\mathbf{ED_i = \beta_0 + \beta_1\, ACFEX_{it} + \beta_2\, ACIND_{it} + \beta_3\, ACME_{it} + \beta_4\, ACSIZ_{it} + \beta_6\, LnTa_{it} + \beta_7\, LEV_{it} + \beta_8\, ROE_{it} + \varepsilon_{it}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots \mathbf{(2)}$$

Where (EDi) the dependent variable, ($ACFEX_{it}$, $ACIVD_{it}$, $ACME_{it}$, $ACSIZ_{it}$) are independent variables, ($LnTa_{it}$, LEV_{it}, ROE_{it}) are control variables, (ε_{it}) the error term, and B_k are coefficients of regression.

Chapter Four

Results and Discussion

4.1 Introduction

This chapter provides a comprehensive overview of the descriptive statistics of the study, and the results of hypothesis testing.

4.2 Descriptive Statistics

Descriptive statistics of ED measures and AC characteristics of the sample will present summarized in table 10. The mean value of ED 56.75 in the annual reports of European companies listed on the STOXX Europe 600 index with a range from 0 to 98.72.

The results indicate that there is evidence that companies listed in STOXX Europe 600 index participate in ED practices, but they do not fully disclose all items of the sustainability report (GRI). This is due to several common challenges related to environmental disclosure, such as: (costs, risks, and competitiveness). Companies may be reluctant to disclose their environmental information for fear of competitive disadvantages due to the sensitivity of certain information, which could undermine their competitive advantage, such as investments in environmental innovation. Alternatively, companies may believe that the cost of including certain items in their reports outweighs their potential benefits.

By observing the large difference between the maximum and minimum values, it becomes clear to us that there is a large difference in the size of disclosures between companies, and this may be due to several reasons: 1) The diverse mix between the components of the index, as it contains large, medium, and small companies, as regulations and laws force large companies to disclose their information. Environmental matters but leaves the choice to medium and large companies in most countries. 2) Companies with large environmental disclosures have a great awareness of the importance of these disclosures in terms of attracting investors and social responsibility. 3) Different business sectors, as the index contains several sectors, the most important of which are the health care sector, industrial goods and services sector, and the banking sector. 4) Cultural diversity. The index includes several countries, the most important of which are the United Kingdom, France, and Italy

Table (8)

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ED	4171	56.751	25.164	0	98.72
ACFEX	4171	0.782	0.413	0	1
ACIND	4171	78.872	29.182	0	100
ACME	4171	5.283	2.291	1	18
ACSIZ	4171	3.884	1.131	3	8
LnTa	4171	15.293	1.335	12.893	17.818
LEV	4171	0.205	0.145	0	0.501
ROE	4171	14.195	14.108	-16.05	46.52

Table (8) shows the independent variable (ACFEX) of audit committee members in STOXX Europe 600 companies with financial expertise. Note that the number of views is 4171 out of 4200 views, which indicates that companies listed in the index largely disclose the number of audit committee members with financial expertise. Table (8) indicates that the average percentage of members with financial expertise was 78.2%, which is an indicator of the efficiency of the financial audit committee, this indicates that audit committees in STOXX Europe 600 companies contain financial experts who will enable their facilities to raise environmental disclosure levels. The high average number of financial experts on the audit committees of companies listed in the STOXX Europe 600 Index is consistent with Section 407 of the Sarbanes-Oxley Act of 2002 of the Securities and Exchange Commission, and will allow companies to gain a deep and comprehensive understanding of the role of the oversight audit committee, demonstrate to the audit committee a sufficient understanding of accounting and financial statements, and enable it to ask specific and valid questions about whether the company’s financial statements are complete and accurate. The standard deviation was 41.3%, which explains the differences in the size of companies within the index and thus the differences in the structure of the audit committee in each type of company. The minimum percentage of financial experts is 0% and the maximum percentage is 100%, which also explains the differences in the organizational structure of the audit committee.

Table (8) shows the independent variable (ACIND) AC Independence members in companies listed in the STOXX Europe 600 index with financial expertise. Note that the number of observations on ACIND amounted to 4171 observations out of 4200, this indicates that the companies included in the index largely disclose the number of AC Independence members. Table (8) indicates that the average percentage of Independence members reached 78.87%, and this is an indication of Company owners or management do not influence the members of AC, as the decisions of the AC will be characterized by complete objectivity, also This indicates that the audit committee in STOXX Europe 600 companies has an independent member, which increases the objectivity and independence of the audit committee reports. The standard deviation also 29.18% which explains the differences in the size of companies within the index and thus the difference in the structure of AC in each type of company. The minimum percentage of financial experts is 0% and the maximum is 100. %, and this is also explained by the difference in the organizational structure of AC.

Table (8) shows the independent variable (ACME) indicates that the companies included in the index largely disclose the number of annual AC meetings. Table (8) indicates that the average of ACME reached 5.3, which is at least higher than the number of meetings recommended by the Sarbanes-Oxley Act. This is a good thing in terms of the number of optional disclosures that greatly help investment decision makers, and this is an indication of preserve its oversight function and ensure the integrity and timeliness of FRs. The standard deviation also 2.3 which explains the differences in the size of companies within the index and thus the difference in the structure of AC in each type of company. The minimum number of annual AC meetings is 1 and the maximum is 18, this is because STOXX Europe 600 index contains several types of large, medium, and small companies.

Table (8) shows the independent variable (ACSIZ) AC size in companies listed in the STOXX Europe 600 index, we note that the number of observations on ACSIZ amounted to 4171 observations out of 4200, this indicates that the companies included in the index largely disclose the number of AC size. Table (8) indicates that the average of ACSIZ reached 3.88, which is at least higher than the number of meetings recommended by the Sarbanes-Oxley Act. This would achieve a useful diversity of experiences and capabilities that would help the Committee achieve its objectives. and this is an indication of effectively implement its responsibilities by allocating its resources, can lead to higher levels of transparency and disclosure and because of there is an inverse relationship between ACS and administrative opportunism, the cost of the agency will decrease. The standard deviation also 1.1 which explains the differences in the size of companies within the index and thus the difference in the structure of AC in each type of company. The minimum number of ACSIZ is 3 and the maximum is 8, this is because STOXX Europe 600 index contains several types of large, medium, and small companies.

Table (8) shows the control variable (LNTA) the natural logarithm of total assets in companies listed in the STOXX Europe 600 index, we note that the number of observations on LnTa amounted to 4171 observations out of 4200, this indicates that the companies included in the index largely disclose its firm size. Table (8) indicates that the average of LNTA reached 15.29, and this is an indication of the company's efficiency in using its assets to collect revenues from its sales. The standard deviation also 1.13 which explains the differences in the size of companies within the index. The minimum number of ACSIZ is 12.9 and the maximum is 17.8, and this is an indication of the market power of STOXX Europe 600 index despite the varying sizes of companies and their different products.

Table (8) shows the control variable (LEV) company solvency in companies listed in the STOXX Europe 600 index, we note that the number of observations on LNTA amounted to 4171 observations out of 4200, this indicates that the companies included in the index largely disclose solvency. Table (8) indicates that the average of company solvency reached 14.2%, and this is an indication of high efficiency of companies in generating their profits. The standard deviation also .141% which explains the differences in the size of companies within the index. The minimum LEV is %0 and the maximum is %50.1, this is because STOXX Europe 600 index contains several types of large, medium, and small companies.

Table (8) shows the control variable (ROE) return on equity of companies listed in the STOXX Europe 600 index, we note that the number of observations on ROE amounted to 4171 observations out of 4200, this indicates that the companies included in the index largely disclose of return on equity. Table (8) indicates that the average of ROE reached

20.5%, and this is an indication of the company's ability to fulfill their obligations. The companies included in STOXX Europe 600 index generally enjoy a high degree of financial security. The standard deviation also %14.5 which explains the differences in the size of companies within the index. The minimum LEV is -16.1% and the maximum is 46.5%, because of most of the companies listed in the STOXX Europe 600 index are highly financially secure, the greatest potential for negative leverage is a stock buyback program supported by cash flow and excellent management.

4.3 Correlation Matrix

We will use Pearson's correlation analysis shown in Table (9) below, to test multicollinearity between study variables.

Table (9)

Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) ED	1.000							
(2) ACFEX	0.033	1.000						
(3) ACIND	0.053	0.181	1.000					
(4) ACME	0.199	0.035	0.036	1.000				
(5) ACSIZ	0.163	0.009	-0.202	0.031	1.000			
(6) LnTa	0.564	-0.007	-0.035	0.266	0.298	1.000		
(7) LEV	0.052	0.042	0.052	0.085	0.043	0.237	1.000	
(8) ROE	-0.016	0.012	0.079	-0.088	0.007	-0.121	-0.026	1.000

The results of Pearson correlation analysis of the variables shown in Table (9) indicate that all correlation ratios are less than 80%, there are no significant multicollinearity problems among the independent study variables. Accordingly, we can conduct regression analysis to test all study hypotheses.

4.4 Regression Analysis

Table (10) illustrates a regression analysis, with the first column representing the independent and control variables, the second column representing the test application in isolation from the control variables, and the third column representing the test application in the presence of the control variables. The test results are discussed below the table.

Table (10)

Regression Analysis

Variables	(Model 1) Environmental Disclosure	(Model 2) Environmental Disclosure
ACFEX	0.579	0.409
	(0.673)	(0.677)
ACIND	0.0140	0.00403
	(0.0244)	(0.0229)
ACME	0.694***	0.601***
	(0.215)	(0.212)
ACSIZ	0.669**	0.535**
	(0.307)	(0.302)
LnTa		8.466***
		(1.014)
LEV		-8.472**
		(3.394)
ROE		0.0201
		(0.0207)
Constant	49.96***	-77.68***
	(2.414)	(15.61)
Observations	4,171	4,171
R-squared	0.33	0.39

Estimates in this table are obtained from fixed-effects regression models, with the decision to use the fixed effects model guided by the Hausman test result ($p<0.05$). Model 1incorporates only the audit committee variables including ACFEX, ACIND, ACME, and ACSIZ. Model 2 includes all audit committee variables as well as additional control variables (LnTA, LEV, and ROE). Robust standard errors are reported in parentheses below coefficient estimates to account for heteroskedasticity.
*** $p<0.01$, ** $p<0.05$, * $p<0.1$.

The regression analysis results presented in Table (10) provide the impact of Audit committee characteristics on environmental disclosure at companies listed in the STOXX Europe 600 index during the period 2012-2018.

The regression analysis inputs amounted to 4,171 inputs out of 4,200, representing 99.31% of the study sample. The results (Constant = 49.96, $p < 0.01$) in model 1 and (Constant = -77.68, $p < 0.01$) in model 2, the value of the constant changed significantly inversely after introducing the control variables, which reflects the contribution of the control variables in determining the level of ED.

In model 1 R-squared = 0.31 and 0.39 in model 2, both values are acceptable. After introducing the control variables, R-squared value increased by 6%, indicating an improvement in explaining the variance of ED. That is, introducing the control variables provided a more accurate and comprehensive explanation, which enhanced the reliability of the model and helped in understanding the impact of the characteristics of AC more deeply.

The first hypothesis posited that [There is a positive and significant impact of audit committee financial expertise (ACFEX) on environmental disclosure (ED)]. The results (β = 0.579, p insignificant), the regression analysis results indicate an insignificant impact of ACFEX on ED. When the control variables were introduced into the model, the beta value decreased, the results (β = 0.409, p insignificant), and the regression analysis results still indicate an insignificant impact of ACFEX on ED. Therefore, H 1 is rejected. This result is consistent with Appuhami & Tashakor (2017), found that the relationship between ACFEX and ESG disclosure is not significant.

The second hypothesis tested whether [There is a positive and significant impact of audit committee independence (ACIND) on environmental disclosure (ED)]. The results (β = 0.0140, p insignificant), the regression analysis results indicate an insignificant impact of ACIND on ED. When the control variables were introduced into the model, the beta value decreased, the results (β = 0.00403, p insignificant), and the regression analysis results still indicate an insignificant impact of ACIND on ED. Therefore, H 2 is rejected. This result is consistent with previous research, so this relationship needs deeper study.

From the researcher's perspective, the lack of a positive impact of financial expertise and of audit committee independence on environmental disclosure is due to three reasons: (1) focus on traditional accounting aspects, their compliance with accounting standards, and their focus on profit and loss reporting, and financial risk reports. (2) Members lack environmental and sustainability expertise that would enable them to adequately understand environmental standards and environmental disclosure issues. (3) Regulatory compliance with environmental disclosure varies between mandatory and voluntary disclosure.

The third hypothesis posited that [There is a positive and significant impact of audit committee meetings (ACME) on environmental disclosure (ED)]. The results ($\beta = 0.601$, $p < 0.01$) support this hypothesis, indicating a significant positive impact of ACME on ED. When the control variables were introduced into the model, the beta value decreased, the results ($\beta = 0.\ 601$, $p < 0.01$), and the regression analysis results still indicate a significant impact of ACME on ED. Thus, H3 is accepted. This result is consistent with (Mohammadi, Saeidi, & Naghshbandi, 2021; Musallam, 2018).

The fourth hypothesis posited that [There is a positive and significant impact of audit committee size (ACSIZ) on environmental disclosure (ED)]. The results ($\beta = 0.669$, $p < 0.05$) support this hypothesis, indicating a significant positive relationship ACSIZ and ED, When the control variables were introduced into the model, the beta value decreased, the results ($\beta = 0.\ 535$, $p < 0.01$), and the regression analysis results still indicate a significant impact of ACSIZ on ED. Thus, H4 is accepted. This result is consistent with (Adel, Hussain, Mohamed, & Basuony, 2019; Dias, Rodrigues, & Craig, 2017).

Regarding the control variables, the results show that LnTa is positively related to ED ($\beta = 8.466$, $p <0.01$), consistent with (Chithambo & Tauringana, 2014) and (Ismail, Abdul Rahman, & Hezabr, 2018) . Furthermore, the results reveal that LEV is negatively related to ED ($\beta = -8.472$, $p < 0.05$), This result is consistent with

(Servaes & Tamayo, 2013). Finally, ROE is found insignificant relationship with ED. This result is consistent with (Dwekat, Meqbel, Seguí-Mas, & Tormo-Carbó, 2022).

4.5 Conclusion

Considering the economic and cultural openness around the world, companies seek to have a good reputation and transparency, and one of these indicators is transparency about their environmental footprint. Companies tend to disclose their environmental performance to keep pace with the requirements of modernity, and according to many economic and social experts, companies seek to disclose their environmental performance for several reasons that can be summarized through the previous studies mentioned above in our study in six points:

1. Building a good reputation and a competitive brand.

2. Companies' compliance with legal requirements.
3. Risk management.
4. Cost savings.
5. Stimulating innovation.
6. Stakeholder engagement.

We can say with certainty that the company’s disclosure of its environmental performance will be a turning point in its development and progress towards achieving its goals.

The study aimed to Impact of Audit Committee Characteristics on Environmental Disclosure: Evidence from STOXX Europe 600 Index During the Period 2012-2018. Four characteristics of the audit committee were selected: financial expertise of the audit committee members ACFEX, independence of the audit committee members ACIND, number of annual audit committee meetings ACME, and size of the audit committee ACSIZ.

Our study relied on a sample of 4171 out of 4200 items from 600 companies of European companies listed on the STOXX Europe 600 index during the period 2012 to 2018. With a representation rate of 99.31%. Characteristics of AC and Environmental disclosure data were collected from Bloomberg and Thomson Reuters Eikon databases, while other financial data were collected from DataStream and World domain databases.

After applying descriptive statistics and appropriate tests for the study hypotheses, several results emerged:

1. There is no statistically significant impact of financial expertise of audit committee (ACFEX) on environmental disclosure (ED) of European companies listed in the STOXX Europe 600 index during the period 2012 to 2018.
2. There is no statistically significant impact of audit committee independence (ACIND) on environmental disclosure (ED) of European companies listed on the STOXX Europe 600 index during the period 2012 to 2018.

3. There is a positive and significant impact of audit committee meetings (ACME) on environmental disclosure (ED) of European companies listed on the STOXX Europe 600 index during the period 2012 to 2018.
4. There is a positive and significant impact of audit committee size (ACSIZ) on environmental disclosure (ED) of European companies listed on the STOXX Europe 600 index during the period 2012 to 2018.
5. There is a positive and significant impact of company size (LnTa) and environmental disclosure (ED) of European companies listed on the STOXX Europe 600 index during the period 2012 to 2018.
6. There is a negative and significant impact of company leverage (LEV) on environmental disclosure (ED) of European companies listed on the STOXX Europe 600 index during the period 2012 to 2018.
7. There is no statistically significant impact of Return on Equity (ROE) on environmental disclosure (ED) of European companies listed on the STOXX Europe 600 index during the period 2012 to 2018.

4.6 Recommendations

After conducting the study and its results appear, we will give several recommendations for future studies.

1. Enhancing the diversity of expertise in the Audit Committee, to include members specializing in environmental fields, and providing specialized training programs in environmental governance for Audit Committee members.
2. Linking performance evaluation indicators for executive departments with environmental disclosure.
3. Establishing subcommittees stemming from the Audit Committee specializing in sustainability and environmental governance, with the aim of monitoring ESG's disclosures.
4. Applying the study as a cross-sectional case to study the impact of the Covid-19 virus.
5. Developing advanced ESG systems by leveraging its resources to support ED.

6. Increase the number of annual meetings of the Audit Committee and include contemporary environmental issues on the Committee's agenda.
7. Providing regulatory incentives that reduce the negative impact of leverage on environmental disclosure.
8. Highlighting the impact of both financial expertise and the independence of audit committee members on environmental disclosure of companies listed on the STOXX Europe 600 index.
9. Not relying on the return on equity indicator or other profitability indicators as determinants of environmental disclosure.

4.7 Limitations

There are some limitations that limit the scope of our study:

1. Difficulty in obtaining data, and not all updated data is available.
2. Scarcity of modern studies, especially field studies.
3. Overlapping concepts and multiple dimensions related to environmental disclosures.
4. Inability to study the case considering the spread of the Covid-19 virus.

List of Abbreviations

Abbreviation	Meaning
AT	Agency Theory
AC	Audit Committee
ACFEX	Audit Committee Expertise
ACIND	Audit Committee Independence
ACME	Audit Committee Meetings
ACSIZ	Audit Committee Size
AICPA	American Institute of Certified Public Accountants
BOD	Board of Directors
CG	Corporate Governance
CSR	Corporate social responsibility
ED	Environmental Disclosures
Enron	American Energy Company
ESG	Environmental, Social and Governance
FR	Financial Reports
GCC	Gulf Cooperation Council
GD	Gender Diversity
GFC	Global Financial Crisis
GHGs	Greenhouse Gases
GRI	Global Reporting Initiative
LT	Legitimacy Theory
MD	Mandatory Disclosure
MED	Mandatory Environmental Disclosure
NYSE	New York Stock Exchange
RBD	Resource-Based Development.
RDT	Resource Dependence Theory.
SEC	Securities and Exchange Commission
SHT	Shareholder Theory
ST	Stakeholder Theory
VD	Voluntary Disclosure
VED	Voluntary Environmental Disclosure

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جامعة النجاح الوطنية
كلية الدراسات العليا

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إعداد
أحمد محمد توفيق عابد

إشراف
د. معز عليا
د. علاء الدين دويكات

قدمت هذه الرسالة استكمالا لمتطلبات الحصول على درجة الماجستير في المحاسبة، من كلية الدراسات العليا، في جامعة النجاح الوطنية، نابلس –فلسطين.

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إعداد

أحمد محمد توفيق عابد

إشراف

د. معز عليا

د. علاء الدين دويكات

الملخص

البيئة في مفهومها البسيط هي كل ما يحيط بالإنسان من كائنات حية على سطح الأرض، وتشمل البيئة الأرض وما تحتويه والفضاء وما يحتويه، ومن هنا نؤكد أننا نتعامل مع البيئة بشكل دوري وهي التي تحدد بقائنا. ويمكننا أن نشير إلى الإفصاح البيئي كشكل من أشكال المسؤولية الاجتماعية للشركات الناتجة عن ممارسة أنشطتها التي تؤثر سلباً على البيئة، حيث يعمل الإفصاح البيئي على حماية البيئة من كافة أشكال التلوث. وحيث أن لجنة التدقيق تساعد إدارات الشركة على كافة المستويات في ضبط وتحسين أدائها لتحقيق كافة أهدافها، فقد جاءت دراستنا بهدف الكشف عن تأثير خصائص لجنة التدقيق وهي الخبرة المالية (ACFEX)، واستقلال لجنة التدقيق (ACIND)، وعدد اجتماعات اللجنة (ACME)، وعدد أعضاء لجنة التدقيق (ACSIZ)، على الإفصاح البيئي: الأدلة من مؤشر STOXX Europe 600 خلال الفترة 2012-2018.

بلغ مجتمع الدراسة وعينتها 600 شركة، وبلغ عدد المدخلات 4171 من أصل 4200 بنسبة تمثيل عالية بلغت 99.3%. ولتحقيق أهداف الدراسة تم قياس عدد الإفصاحات البيئية من خلال مؤشر بلومبرج للإفصاح البيئي والاجتماعي والحوكمة، حيث يشير الرقم 100 إلى أعلى درجة للإفصاح، بينما يشير الرقم 0 إلى أدنى درجة للإفصاح. وتم قياس خصائص لجنة التدقيق من خلال قياس خصائصها الأربعة. وفي هذه الدراسة، نستخدم تحليل الانحدار اللوحي لاختبار تأثير خصائص لجنة التدقيق على الإفصاح البيئي.

ولتحقيق هذا الهدف، تم تحليل البيانات باستخدام نسخة برنامج STATA. والطريقة الإحصائية الرئيسية المستخدمة في هذه الدراسة هي التحليل الوصفي، ويتم استخدام مصفوفة الارتباط لإظهار معامل الارتباط بين المتغيرات، ويتم استخدام تحليل الانحدار لفحص اتجاه وقوة العلاقة بين المتغيرات المستقلة والمتغيرات التابعة.

وكشفت الدراسة عن وجود تأثير إيجابي قوي لكل من عدد اجتماعات لجان التدقيق وعدد أعضائها على الإفصاحات البيئية، في حين لم تجد الدراسة تأثيرًا لكل من الخبرة المالية واستقلال أعضاء لجان التدقيق على الإفصاحات البيئية. كما كشفت الدراسة عن تباين في جودة وكمية الإفصاحات البيئية بين الشركات المدرجة على مؤشر ستوكس أوروبا 600 من حيث الكمية، حيث تكون الإفصاحات كبيرة في بعض الأحيان وفي أحيان أخرى تكون صغيرة. كما تباينت جودة الإفصاحات البيئية، حيث تكون إلزامية في بعض الأحيان وفي أحيان أخرى تكون طوعية. وفي كلتا الحالتين، يرجع ذلك إلى عدة عوامل، أبرزها: قطاع الأعمال، وحجم الشركات، والتعددية الجنسية للشركات.

الكلمات المفتاحية: لجنة التدقيق، خصائص لجنة التدقيق، البيئة والمجتمع والحوكمة (ESG)، الغازات المسببة للاحتباس الحراري (GHGs)، مبادرة إعداد التقارير العالمية (GRI).