Strategies for Implementing Mandatory Environmental Disclosures: Lessons From Europe

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The introduction of mandatory environmental disclosure laws has created significant uncertainty for numerous American companies. Firms may be compelled to provide assured environmental reports through state and international legislation. This study aims to explore measures to effectively disclose audited environmental information through a systematic review. The practical recommendations propose that mandatory environmental disclosures should be integrated as a strategic objective, the board of directors should oversee the implementation of disclosure requirements, organizational culture and leadership should act as catalysts for success, assurance providers should adopt a consultative approach in their processes, and environmental performance should be evaluated.

Keywords: environmental, financial statement reporting, disclosures, greenhouse gases, climate-related

INTRODUCTION

The landscape of mandatory environmental disclosures in the United States has experienced several shifts, resulting in uncertainty for many organizations. On March 6, 2024, the US Securities and Exchange Commission (SEC) issued The Enhancement and Standardization of Climate-Related Disclosures, only to have it suspended a month later. The situation was further complicated by a US Supreme Court ruling that challenged the authority of administrative bodies like the SEC. According to McGowan (2024), this ruling suggests that corporate environmental disclosures will need to be enacted by Congress or individual states rather than the SEC. With questionable support from a new administration and a new majority, the likelihood of a federally backed environmental mandate appears diminished in Congress.

At the state level, California has emerged as a frontrunner in mandating environmental disclosures through legislation such as The Climate Corporate Data Accountability Act. Signed into law on September 27, 2024, this bill requires businesses operating in California to report on greenhouse gas emissions and climate-related financial risks. Following the wildfire catastrophes of 2025, California's requirements may garner increased attention owing to the substantial risks and losses involved.

US companies may still be subject to other regulatory requirements. Those with significant European operations must adhere to the European Union's Corporate Sustainability Reporting Directive, which came into effect on January 5, 2023. The 2024 fiscal year marks the first reporting period requiring companies to disclose social and environmental risks and opportunities and the impact of their actions on people and the environment (European Commission, n.d.).

Disclosure regulations are compelling companies to reassess how environmental issues affect their operations, prompting executives to strategize to effectively implement their sustainability plans (PWC, 2025a). Meanwhile, strategies and operations related to climate change have become a priority for numerous companies (Steinmann, 2023). Whether it is federal, state, or international law, US companies should be prepared for mandatory environmental disclosures. Consequently, this study examines the methods by which European firms successfully implement auditable environmental disclosures. This qualitative research applies evidence-based management principles through a systematic review. The initial step in evidence-based management involves identifying the problem to be addressed and providing evidence of its existence (Barends & Rousseau, 2018). The problem at hand is: In a dynamic regulatory environment, US companies may lack strategies to address mandatory auditable environmental disclosures.

The problem is crucial for the following reasons: (1) the mandated disclosures offer valuable information to investors and consumers (Dagiliene et al., 2020; EY, 2020; Frey et al., 2023; Taylor & Collins, 2022); (2) organizations may be obliged to reveal information without having the necessary infrastructure, procedures, oversight, or personnel in place (Kaplan, Ramanna, & Schauer, 2021; Lyon & Maxwell, 2011; Peters & Romi, 2013; Warren, 2023); (3) auditing firms might be required to provide services in areas where they lack expertise (Hummel, Schlick, & Fifka, 2019; Soroosh, 2022); (4) environmental disclosures encompass various risks, including legal, political, and financial performance risks (Herren Lee, 2021); and (5) expenses may increase to meet disclosure requirements (Peirce, 2022; Soroosh, 2022). This study aims to address the following central question: What strategies can be derived from the European Union's approach to manage the transition towards auditable environmental disclosures in the United States?

BACKGROUND

Voluntary Disclosures

Numerous American corporations engage in environmental disclosures as part of voluntary environmental, social, and governance (ESG) reporting. For instance, 95% of S&P 500 firms have revealed ESG information (Foltin & Holtzblatt, 2022). Furthermore, a PWC (2022) survey showed that all S&P 100 companies incorporated some form of climate-related disclosures in their business risk section of the 10K filing, while 43% included a discussion in the Management's Discussion and Analysis section.

One potential driver for voluntary disclosures is that investors may view non-disclosure negatively, interpreting it as unfavorable news (Dye, 2017). McGill (2020) suggests that customers and shareholders motivate voluntary disclosures. Chithambo et al. (2020) have observed that regulators, customers, and suppliers, rather than shareholders or employees, may influence voluntary greenhouse gas disclosures, noting potential bias in environmental disclosures. Voluntary ESG disclosures might enhance corporate transparency (Ellili, 2022), boost financial reporting quality (Kareem AL Ani, 2021), and safeguard the public from greenwashing (Delmas & Burbano, 2011). Henisz, Koller, and Nuttall (2019) propose that voluntary ESG could generate corporate value.

The SEC has pointed out that voluntary disclosures often employ inconsistent and poorly defined frameworks (Darnall et al., 2022). Moreover, non-financial information, such as greenhouse gas emissions, is subject to fewer regulations and unreliable (Erkens, Paugam, & Stolowy, 2015). Vander Bauwhede and Van Cauwenberge (2022), in their study of 660 European firms from 2017-2020, highlight concerns about data credibility and emphasize the importance of auditor assurance. Although companies may disclose environmental information, these data are frequently unaudited. Consequently, voluntarily disclosed information may not fulfil the SEC requirements of "consistent, comparable, and reliable" (SEC 2022, p.7) data for investor decision-making. The SEC notes that voluntary disclosures often lack depth, consisting of boilerplate discussions without substantial business risk analysis (SEC, 2022). Supporting the SEC's stance, Foltin and Holtzblatt (2022) observe that voluntary ESG disclosure data and presentation are inconsistent, with significant variation in the frameworks used by companies.

The SEC Ruling and Opposition

The SEC mandated the inclusion of specific disclosures in audited financial statements, encompassing the present and future effects of climate change on business operations, greenhouse gas emissions, board oversight of climate-related risks, and the quantifiable financial impact of climate-related events and transactions on financial statement items (SEC, 2022). The SEC (2022) emphasized that its primary objective is safeguarding investors and appraising them of potential climate-related investment risks. Compulsory environmental disclosures would enlighten the public about climate-related issues affecting company performance. The SEC believed that existing requirements and voluntary disclosures increased expenses and hindered investors' decision-making capabilities. Moreover, separate reports prepared outside the SEC filing process lacked the thoroughness and precision provided by audited financial statements. Finally, the SEC highlighted the influence of climate-related issues on a company's operations and strategies, asserting that informing investors of these risks would enable more efficient resource allocation in capital markets and promote competition.

Critics of the SEC's ruling have argued that it is excessively contentious and expensive. A dissenting SEC commissioner, Commissioner Peirce (2022), contends that it would undermine the existing regulatory framework and negatively impact investors, the economy, and the SEC itself. Asserting that the SEC lacks the authority to enforce the proposal, Peirce (2022) claims there is a disparity between the factual basis of environmental disclosures and the SEC's mission. In a similar vein, Mahoney and Mahoney (2021) assert that the SEC is contravening its mission of protecting everyday investors and restricting efficient capital markets by mandating climate disclosures. The authors perceive the SEC as becoming too closely aligned with the political aspirations of governing parties, cautioning that as dominant party interests influence the SEC, investors will become more vulnerable to political risks, akin to investors in emerging markets. Soroosh (2022) points out the uncertainty surrounding how companies should address a controversial proposal because of its scope, complexity, and costs. The author suggests that an individual's perception of the SEC proposal as a positive change or burdensome regulation is contingent upon their political views. Nevertheless, in a study of 146 large corporations, Lashitew and Mu (2024) discovered statistically significant support for the SEC's proposal.

Despite the controversy, these requirements are comparable to other accounting principles, which have evolved over time amidst numerous differences of opinion (Perez et al., 2022). As a point of comparison, Sarbanes-Oxley (SOX) implementations were initially costly and challenging for most organizations, but these issues diminished over time (Wagner & Dittmar, 2006). The authors note that SOX resulted in enhanced investor protection and increased shareholder values, while executives approached SOX in different ways. One approach was to fulfil the minimum requirements at the lowest cost, whereas the other was to view the SOX as an opportunity and invest in new procedures in an attempt to generate a return on the investment.

Disclosures and Performance

A PWC (2025b) investigation revealed that chief executives reported enhanced revenues and profit margins resulting from climate-related investments. Furthermore, various studies have explored the connection between environmental disclosures and share prices. Flammer (2013) determined that companies' environmental initiatives could lead to substantial share price increases, whereas those failing to act favorably towards the environment experienced a gradual decline in share prices. Investors might also respond positively to disclosed environmental information. Two independent studies examining investors' reactions to Newsweek's 2009 publication of corporate green ratings observed significant increases in individual share prices (Cordeiro & Tewari, 2015; Lyon & Shimshack, 2015). Lyon and Shimshack (2015) attribute this share price rise to a scarcity of inefficient market data, contending that if environmental performance information were readily accessible to investors, Newsweek's release would have had minimal impact on share prices.

Investigations have also been conducted to evaluate the impact of environmental disclosures on other variables that may enhance firm performance or value. Clarkson et al. (2013) suggest that disclosing a proactive environmental strategy signals investors, who subsequently influence share prices positively.

Cormier and Magnan (2015) argue that environmental disclosures enhance the predictive value of a firm's financial data for investors and shape their perception of a firm's legitimacy. Bolognesi and Burchi (2023) propose that environmental disclosures serve as a strategic tool for firm value creation. Aragón-Correa and Sharma (2003) have discovered that disclosed proactive environmental strategies exceeding mandated regulations may positively affect firm financial performance. Fifka (2013) has identified a positive relationship between environmental disclosures and firm performance, while Friede, Busch, and Bassen (2015) has found a positive correlation between ESG disclosures and firm performance. Ernst and Woithe (2024) have determined that S&P 500 firms with lower ESG scores should anticipate higher capital costs in the future.

Nevertheless, not all studies indicate a positive correlation between environmental disclosures and firm or stock performance. Qiu, Shaukat, and Tharyan (2016) find no relationship between profitability, firm value, and environmental disclosures. They suggest that previous studies may reflect the importance of environmental disclosures in environmentally sensitive industries. Barnett and Salomon (2012, p.1304) contend that some firms experience positive performance while others face negative outcomes due to environmental disclosures, stating, "whether it pays to be good depends on how well firms are able to capitalize on their social responsibility efforts".

Research has shown a link between environmental disclosures and environmental performance and firm financial performance. Dawkins and Fraas (2011) note a positive association between climate-related disclosures and firm environmental performance. Clarkson et al. (2008) have studied 191 US firms in highly polluting industries, revealing a positive relationship between environmental performance and disclosures, with high-performing firms being more transparent. Lyon and Maxwell (2011) suggest a nonmonotonic relationship between environmental disclosure and performance, where low performers may increase disclosures due to external pressures, whereas high performers may not.

The SEC requires boards of directors to govern climate-related risks. Kock, Santaló, and Diestre (2012) propose that the board of directors, management accountability, and CEO compensation influence environmental performance. A survey of 350 audit board members identified the lack of carbon reduction strategy and management accountability methods as the most significant internal challenge for climate change (Rocher, Iwasaki, & Konisburg, 2022).

Berrone and Gomez-Mejia (2009) find that CEOs in polluting industries are rewarded for good environmental performance, with environmental governance strengthening this relationship. According to de Villiers, Naiker, and van Staden (2011), board composition may also enhance environmental performance. They note that boards with better environmental performance tend to be larger, more independent, and include more legal experts. Cormier and Magnan (2015) argue that boards should view environmental practices and disclosures as strategic initiatives owing to their impact on stakeholders and firm legitimacy.

An Uncertain Future for Environmental Disclosures

The fate of the SEC's ruling and California's proposed legislation remains uncertain amidst potential legal challenges. It is yet to be seen whether other states with similar environmental priorities, such as New York and Illinois, which are home to numerous Fortune 500 companies, will follow California's lead in implementing their disclosure regulations. The question arises as to whether states can determine their environmental policies independently of federal oversight, akin to abortion rights. Irrespective of these outcomes, certain companies will need to adhere to European disclosure requirements, and they should be prepared for the possibility of mandatory environmental reporting imposed both internationally and domestically. As American firms develop their strategies, governance structures, and resource allocation, they may find it beneficial to examine the approaches adopted by European companies in complying with disclosure mandates.

METHOD

This study is a systematic review, which has been described as a "young and rapidly developing field of study" (Gough, Oliver, & Thomas 2017, p.9) and a "cornerstone of evidence-based management practice" (Briner & Walshe 2014, p.13). Barends and Rousseau (2018) define a systematic review as a review of existing research using explicit, accountable rigorous research methods. This study adheres to the systematic review phases outlined by Petticrew and Roberts (2006), which are as follows: study initiation and question development, evidence accumulation, quality appraisal, synthesis methodology and findings appraisal, analysis and findings, and conclusions and implications.

Question Development and Evidence Accumulation

Evidence-based principles seek to convert practical informational requirements into researchable inquiries, with a well-crafted question facilitating focused research to address the issue (Booth, 2006). The research question was formulated considering its practical relevance, existing European evidence, and the scope of research conducted in the United States.

The CIMO framework (context, intervention, mechanisms, and outcomes) was employed to develop the research question, as it is beneficial for crafting queries in management and organizational studies (Anderson, Ellwood, & Coleman, 2017; Briner, Denyer, & Rousseau, 2009). The framework was applied as follows: the context pertains to US publicly traded companies; the intervention involves strategies leading to successful environmental information disclosures; the mechanisms for identifying a successful outcome are represented by the audited financial statement disclosures of US publicly traded companies; and the outcome is in compliance with mandatory environmental disclosure requirements.

The primary data source was the most reliable research (Briner, Denyer, & Rousseau, 2009), gathered through a comprehensive database search. Multiple databases were queried using search strings with defined inclusion criteria (Gough, Oliver, & Thomas, 2017). Boolean strings were divided into various topics (building block approach), a method known to be effective in database searches (Boren & Moxley, 2015). A summary of databases, search terms, inclusion/exclusion criteria, and results is provided in Table 1.

In addition to database searches, snowballing techniques were utilized. Snowballing involves examining reference citations in research targeted by the systematic review. Snowball sampling is regarded as "the most widely used qualitative research sampling method across various social science disciplines" (Noy, 2008, p.330). Wohlin (2014) discovered that snowballing techniques could serve as an effective primary search strategy for systematic reviews, potentially surpassing database searches.

The study selection process was documented using a flowchart or flow diagram, detailing the inclusion and exclusion of studies throughout the search process (Barends, Rousseau, & Briner, 2017; Gough, Oliver, & Thomas, 2017; Moher et al., 2010; Petticrew & Roberts, 2006). This flowchart illustrates how studies were eliminated from initial search results to reach the final selection. Abstracts, introductions, literature reviews, and findings were assessed for relevance to determine if the article addressed the review question. The quality of researched studies was evaluated prior to their appraisal, examining their literature reviews, conclusions, and final discussions (Rojon, Okupe, & McDowall, 2021).

Quality Appraisal of the Included Studies

Evaluating research involves an "unbiased, careful examination of all aspects of studies to judge their strengths, limitations, trustworthiness, meaning, and applicability to practice" (Gray, Grove, & Sutherland, 2017, p.431). The Mixed Method Appraisal Tool (MMAT) (Hong et al. 2018) was selected for empirical studies because of its capacity to assess both qualitative and quantitative review quality (Gough, Oliver, & Thomas 2017).

Grey literature was employed because of its worth as a resource for practitioners and decision-makers, as it encompasses policy and pertinent information from authoritative sources (Godin et al., 2015). Furthermore, Paez (2017) highlights the valuable contribution of grey literature to systematic reviews. The focus was on tier one grey literature (journals), which Adams, Smart, and Huff (2017) describe as highly retrievable and credible.

A data extraction was conducted on the selected studies, as this process offers additional information about the chosen research to showcase elements of quality and relevance for the review (Gough, Oliver, & Thomas, 2017). The resulting table incorporates sample sizes, populations, findings, and limitations (Barends, Rousseau, & Briner, 2017). The sample and population description provides details regarding the data sources and what the data are intended to represent.

Synthesis Methodology

We opted for a thematic synthesis approach, which is suitable for reviews drawing inferences from primarily emergent claims while integrating findings from diverse research types (Gough, Oliver, & Thomas, 2017). Studies that passed the quality assessment were examined both individually and collectively to derive fresh insights from the aggregated information (Gough, Oliver, & Thomas, 2017). The research employed coding to classify data and extract crucial findings (Saldana, 2021).

Codes were grouped based on similarities or categorized according to shared meaning or purpose, leading to the identification of patterns (Saldana, 2021). The coding process focused on empirical literature's findings, discussions, implications, and conclusion sections. For grey research, coding was applied to specific sections addressing the research question. The process of developing categories from codes progressed towards a consolidated finding. Findings are concepts that extend across multiple articles and encompass a broader meaning than individual categories (Gough, Oliver, & Thomas, 2017). The transformation of categories into findings "transcends the particular reality of your data and progresses toward the thematic, conceptual, and theoretical" (Saldana 2021, p.17). Atlas.ti was utilized for code and category creation, owing to its capacity for systematic and transparent qualitative data analysis (Friese, 2019).

Findings Appraisal Methodology

The results were evaluated using the Confidence in the Evidence from Reviews of Qualitative research (CERQual) methodology. CERQual helps to establish the level of confidence that should be placed in individual synthesized findings by assessing how well a finding represents the phenomenon under investigation (Lewin et al., 2018). The evaluation of the findings was based on four elements: an assessment of the methodological approaches used in the contributing studies, the relevance of these studies to the research question, the coherence of the review findings, and an examination of the data supporting each finding (Lewin et al., 2015).

ANALYSIS AND FINDINGS

Dataset Description

Following the database search and removal of duplicates, 99 studies remained. A thorough examination of abstracts, introductions, literature reviews, findings, and conclusions was conducted to assess their relevance to the research question, eliminating an additional 41 records. The remaining studies underwent evaluation of their literature reviews, methodologies, and findings (Rojon et al., 2021). A further 36 studies were excluded, leaving 22 studies to be assessed using the MMAT and subsequently included in the synthesis. Of these 22 chosen studies, 14 were obtained from database search results, whereas 8 were identified through snowballing. The process of article selection, encompassing identification, screening, eligibility, and final results, is illustrated in the selection flowchart presented in Figure 1.

FIGURE 1
SELECTION FLOWCHART

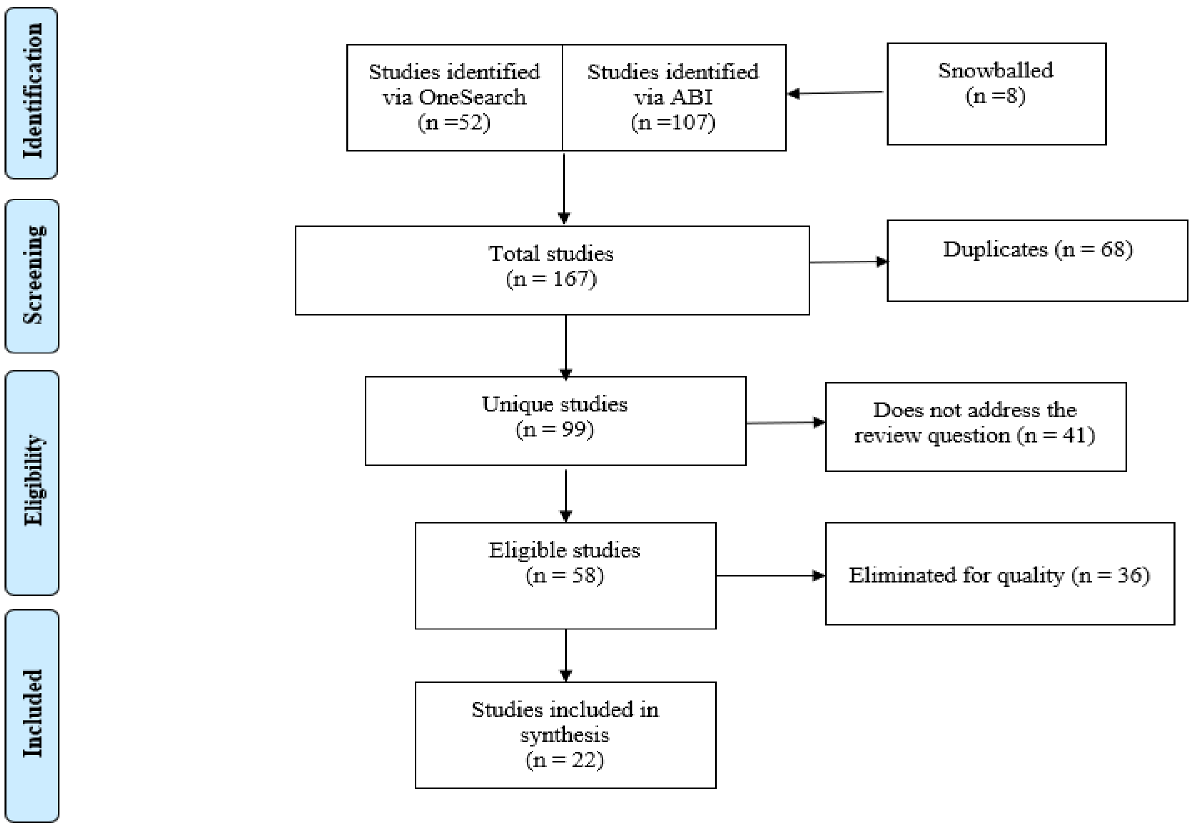


Table 2 provides an overview of the analyzed article. The bulk of the research identified comprises 18 quantitative studies, complemented by 3 qualitative designs and 1 grey research piece. The majority of studies, 13 in total, were published between 2020 and 2023, whereas 4 were from 2015–2019, and 5 from 2005–2014. Two snowballed articles predate the initial search criteria year of 2010. Studies utilizing data from multiple European nations were most prevalent, followed by those from Italy and the UK. The grey literature article was intended for a global readership.

Appraisal of Studies

The MMAT from Hong et al. (2018) was employed to evaluate the 22 studies. According to Hong et al. (2018), the initial screening process involved assessing whether each study had a clear research question or objective and whether the collected data supported the study's validity. Subsequent appraisal questions varied based on the study type (quantitative or qualitative) and examined the methodologies, data interpretation and analysis, conclusions, and the connections between these elements. Responses to these questions were categorized as yes, no, or cannot tell. Following this appraisal, all 22 studies were deemed suitable for inclusion in the synthesis process.

Data Synthesis

Before initiating the coding process, the research questions and study findings were examined. The coding procedure commenced with importing the 22 studies into Atlas.ti. Saldana (2021) outlined that the initial coding cycle employed descriptive, in vivo, and process codes. Descriptive coding was utilized sparingly to generate subtopics deemed necessary for addressing the research question, while in vivo and process codes were predominantly employed because of their action-oriented nature (Saldana, 2021).

The coding process in Atlas.ti yielded 240 codes, which were subsequently organized into 20 categories during the second cycle of coding. This secondary phase involved the grouping of codes into meaningful categories (Saldana, 2021). The findings were then synthesized from these categories, conceptualizing ideas with greater significance than the individual groupings (Gough et al., 2017). A comprehensive list of the findings and their corresponding source studies can be found in Table 3 of the appendix.

Findings Appraisal

The research outcomes were evaluated using the CERQual framework outlined by Lewin et al. (2018). Munthe-Kaas et al. (2018) provide a scale (no or minor, minor, moderate, or serious concerns) to assess four components. The overall assessment was categorized as high, moderate, low, or very low (Lewin et al., 2018). Only minor methodological concerns were identified upon review for Aureli et al. (2020) and O'Dwyer (2011). The inclusion of grey literature from Simnett, Nugent, and Huggins (2009) was deemed a minor methodological limitation. All findings were classified under minor methodological concerns because of the use of Aureli et al. and Simnett, Nugent and Huggins.

According to Glenton et al. (2018), data adequacy can be evaluated by examining its richness and quantity. The sample studies neither focused on outliers nor made unexpected claims or challenge established knowledge (Glenton et al., 2018), suggesting no issues with data richness. However, three studies raised minor data adequacy concerns due to limited sample sizes or study data. Aureli et al. (2020) and O'Dwyer (2011) are case studies of one and two companies respectively, while O'Dwyer (2011) interviewed 17 audit professionals from two large accounting firms. These studies contributed to all five findings, as shown in Table 3, and were noted as minor data adequacy concerns for CERQual purposes.

Colvin et al. (2018) observed no contradictory data, ambiguity in the underlying findings, or concerns about inadequate data exploration by the original authors. Thus, there were no data coherence issues. Furthermore, no relevant problems were identified, as the inclusion criteria closely aligned with the research question, and the included studies directly pertaining to the phenomenon under investigation (Noyes et al., 2018). All findings were deemed highly likely to represent the research question, with only minor concerns regarding methodology and data adequacy. In conclusion, all findings were assessed as reliably representing the phenomenon in question (Lewin et al., 2018).

Discussion of Findings

The study's results highlight crucial approaches for effectively adhering to required audited environmental disclosure regulations. These approaches encompass various aspects, including corporate strategy, governance, organizational culture, and assurance.

Finding 1: Strategic Initiatives Contribute to the Successful Implementation of Mandatory Disclosures

In his 1995 article "A Natural-Resource-based View of the Firm", Hart proposes that companies facilitating environmentally sustainable operations will bolster their strategy and competitive advantage. Hartmann and Vachon (2018) suggest that firms employing environmentally sustainable strategies are more likely to possess dynamic capabilities and competitive edges. In line with Hart's perspective, adopting environmental disclosure processes as a strategic initiative could contribute to successfully implementing mandatory environmental disclosures. For French listed companies, Baalouch, Ayadi, and Hussainey (2019) identify firm strategy and vision as factors influencing environmental disclosure quality. Latan et al. (2018) indicate that corporate strategies may impact environmental performance through environmental management accounting, whereas Latifah and Soewarno (2023) discover that environmental accounting strategies might be crucial in enhancing a firm's sustainability. Magsi et al. (2018) suggest that mission statements may need revision to incorporate firms' environmental visions.

Finding 2: Governance Plays a Key Role in Implementing Mandatory Environmental Disclosures

The governance through the board of directors influences the successful disclosure of environmental information. Using a sample of French-listed firms, Moalla, Salhi, and Jarboui (2021) reveal a direct link between company governance and high-quality environmental reporting. Similarly, Fahad and Rahman

(2020) identify governance as contributing to enhanced environmental disclosures. The board of directors (Baalouch, Ayadi, & Hussainey, 2019; Bravo & Reguera-Alvarado, 2019; Fisch, 2019; Mallin, Michelon, & Raggi, 2013; Moussa, Kotb, & Helfaya, 2022), audit committees (Al-Shaer, Salama, & Toms, 2017; Arif et al., 2021; Kend, 2015; Pucheta-Martínez, Bel-Oms, & Rodrigues, 2018), and sustainability committees (Aureli et al., 2020; Moalla, Salhi, & Jarboui, 2021; O'Hare, 2022; Peters & Romi, 2014) have been identified as sources of governance related to environmental disclosures.

The effectiveness of environmental disclosures may be enhanced by the board of directors and various board factors. Kumari et al. (2022) have discovered that board activity and the presence of a sustainability committee has a positive impact on environmental disclosures. Rupley, Brown, and Marshall (2012) indicate that board characteristics such as independence, expertise, and diversity improve voluntary disclosure quality. In a study of the largest US companies, Peters and Romi (2014) find that the existence of an environmental committee increases the likelihood of transparent voluntary greenhouse gas disclosures. Furthermore, the audit committee may play a crucial role in environmental disclosures, as Appuhami and Tashakor (2017) noted.

Finding 3: Organizational Climate Culture and Management Views Towards Climate Performance Are Positive Disclosure Success Factors

The effective adherence to mandatory disclosure requirements may be linked to an organization's culture, management's perspective on climate performance, and the company's actual environmental track record. Organizational culture is the set of principles and convictions that guide individuals in making decisions aligned with the organization's values (Afum, Agyabeng-Mensah, & Owusu, 2020). Entities with green corporate values or behaviors may be more adept at complying with mandatory environmental disclosures. Adams (2002) find that environmental reporting processes are influenced by internal organizational factors, including corporate culture, while Buhr and Freedman (2001) observe that Canada's robust environmental culture results in more voluntary environmental disclosures compared to the United States. Imran and Jingzu (2022) point out that organizations lacking a green culture may have limited resources available for investing in environmental strategies.

In a report examining how leaders influence cultural change, Leetaru (2019, p.24) states, "leaders must align what they say, how they behave, and how their companies operate in terms of processes, budgets, and policies". Management perspectives may also play a role in successful environmental disclosures. Latan et al. (2018) find that when management is committed to environmental issues, they are more likely to support a system communicating environmental information. A company's approach to complying with other governmental regulations may indicate its level of compliance with mandatory environmental disclosures. In an examination of approximately 100 listed Norwegian companies, Fallan and Fallan (2019) discover that aggressive interpretations of tax codes correlate with less stringent mandatory environmental disclosures.

Finding 4: Assurors Contribute to Successful Mandatory Environmental Disclosures

The selection of an appropriate assurance provider is crucial for a company's ability to deliver audited environmental disclosures, as auditors must thoroughly ensure the credibility of non-financial information for shareholders (Chen et al., 2016). Auditors play a vital role in maintaining the quality of non-financial information (Cortesi & Vena, 2019), with their experience, ethical principles, and affiliated firms being key factors for success. Examining 130 European companies, Chouaibi and Hichri (2021) find that auditors' specialized skills and ethical standards influence the quality of integrated disclosures. The type of assurance expertise may also be valuable during the assurance process. Hummel, Schlick, and Fifka (2019) find that accountant auditors provide more in-depth assurance services, whereas non-accountant assurors offer greater breadth in their services.

In a study of Spanish firms, comprising 1,312 firm-year observations, Pucheta-Martínez, Bel-Oms, and Rodrigues (2018) note that the four largest accounting firms contribute significantly to successful corporate social responsibility reporting. Fernandez-Feijoo, Romero, and Ruiz (2019) and Suddaby, Cooper, and Greenwood (2007) also indicate that sustainability reporting levels are higher when large firms are employed. Al-Shaer, Albitar, and Hussainey (2022, p.7) observe that the quality of assured sustainability reports improves when completed by top accounting firms "due to their expertise in risk assessment, planning, and consideration of materiality".

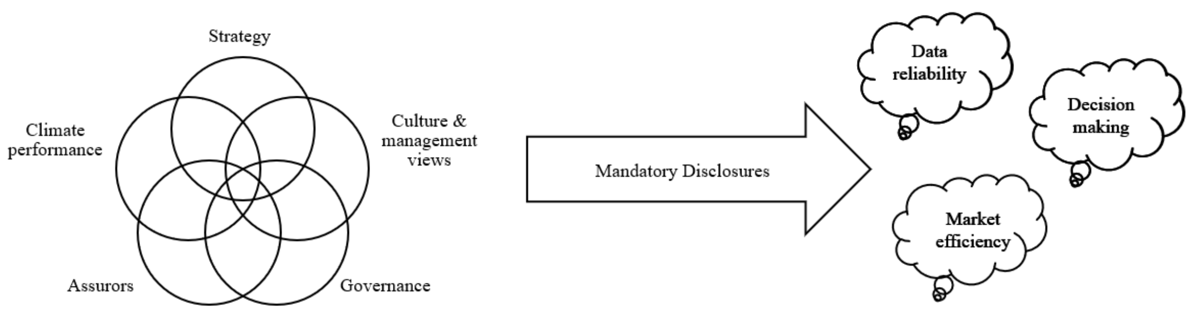
Finding 5: Firm Environmental Performance Contributes to Successful Mandatory Environmental Disclosures

Research on environmental disclosures and performance has yielded interesting findings. Dawkins and Frass (2011) have examined S&P 500 companies and have found that organizations with superior environmental performance are more inclined to offer voluntary climate change disclosures. Similarly, Cormier and Magnan (1999) suggest that a firm's environmental performance positively affects its environmental disclosures. In a related study, Magsi et al. (2018) discover that organizational culture elements such as adaptability, consistency, and mission positively impact organizational culture, potentially enhancing environmental performance. The authors emphasize the importance of aligning environmental strategies with company culture and routine operations.

Conceptual Model

Figure 2 illustrates the key elements that contribute to effective disclosures: (1) corporate strategies, (2) governance, (3) culture, and management perspectives, (4) assurance providers, and (5) climate performance. This study did not prioritize these findings; they are presented as interconnected. Joly (2022, p.7) observes that "strategy, culture and purpose are interlinked, with changes in one necessitating adjustments in the others to maintain equilibrium and form." The diagram also highlights that compulsory disclosure leads to more dependable data, enhanced decision-making processes, and more efficient market operations.

FIGURE 2
CONCEPTUAL MODEL



Recommendations for Management

To aid in adhering to compulsory environmental disclosure requirements, suggestions are offered as an expansion of the consolidated findings. These recommendations aim to support corporate professionals in preparing to comply with legislated environmental reporting. The following proposals are put forth.

Adopting mandatory environmental disclosures should be viewed as a strategic endeavor. This initiative ought to encompass corporate objectives, dissemination of the vision and goals, resource allocation, and employee incentivization. Targets should be established to meet disclosure requirements and decrease reportable climate emissions. (The third finding indicates enhanced corporate climate performance may also lead to improved environmental disclosures.) The strategy should be communicated throughout the organization and to existing and potential shareholders. A steering committee comprising representatives from various functional areas should be formed, including IT, accounting, human resources, and risk management.

Funds should be allocated to incentivize management to achieve the required environmental outcomes. Furthermore, resources should be dedicated to improving environmental emissions, IT, and accounting functions. Management goals should be established, measured, and evaluated, with bonuses tied to goal achievement. The human resource department should be involved as personnel decisions related to hiring and compensation are integral to the strategic initiative. Returns on the strategy's investment should be measured, including the opportunity cost of non-compliance with environmental legislation, as part of evaluating the strategic initiative. Ideally, the environmental impact would be included; however, calculating this cost may prove impractical.

It is worth noting that other mandated accounting regulations have benefited from a strategic approach. For example, in an analysis of SOX implementations, Wagner and Dittmar (2006) noted successful compliance for companies that strategically embraced the SOX. The authors noted that firms could leverage their allocated compliance resources to generate a return on investment and lower operating costs.

The board of directors should be crucial in ensuring successful compliance with environmental disclosures. The board is responsible for safeguarding shareholders' interests. As such, their role may be expanded to include providing direction and oversight related to improving environmental performance, evaluating climate-related risks, and complying with mandatory disclosures. Board members should be assessed to ensure the board's composition and expertise will contribute to success. Members should possess knowledge in climate-related issues while maintaining independence and diversity. Board members from firms in highly pollutive industries may offer valuable expertise. The board members should undergo regular evaluation for their participation, qualifications, and performance. As noted by McKinsey and Company (2022), effective boards proactively seek company information; include members who dedicate their time, are subject to a regular evaluation process, and who are not part of the company's executive team; and have strong leadership in the form of a chair.

Environmental performance should be communicated to the board through disclosure processes akin to financial reporting. Environmental reports ought to accompany financial packages, aiding the board in decision-making and future planning.

The board might benefit from establishing a dedicated sustainability committee to oversee environmental disclosure compliance. This committee could concentrate on environmental matters and climate-related risks, while the existing board handles other governance issues. Cross-membership between the sustainability and audit committees could prove advantageous.

Management should foster an eco-friendly corporate ethos. Cultivating such a culture involves identifying desired behaviors and structuring the organization to facilitate them (Holland, St-Onge, & Ling, 2017). Leaders should initiate and exemplify this culture through clear, consistent messaging and demonstrating environmental commitment to shape the culture and enhance firm value. Human resources should contribute to developing this green culture through appropriate policies. Improved environmental performance should be mandated as a cultural element and addressed strategically, including resource allocation and incentivization.

Mandatory environmental disclosures should be viewed as a value-adding opportunity rather than a burden. Management's attitude towards corporate environmental performance should drive improvements in both performance and disclosures.

Selecting the right assurance partner is crucial. Experience and specific skills in environmental matters have proven important, with large accounting firms possessing resources to develop such expertise. These firms could potentially transfer experience from Europe, where audited disclosure requirements have been implemented, to the United States. Non-accounting professionals with environmental expertise will be valuable in these engagements. Larger accounting firms could afford teams comprising both traditional auditors and environmental specialists. Companies will seek a consultative approach, with auditor teams providing guidance and critical input based on their experience.

Limitations of the Study

Like all studies, this one has some limitations. First, environmental disclosure requirements may not be fully implemented in the United States; however, some level of environmental reporting will likely be mandatory for American firms with significant European operations. Despite this uncertainty, the findings should still prove valuable to practitioners and management for future disclosure regulations or other substantial accounting modifications. As demonstrated, companies that successfully implemented the SOX viewed the ruling as a strategic initiative that enhanced corporate value, as synthesized in the first finding. Strategic initiatives, governance, leadership, and improved functional areas should apply to organizational efforts beyond compulsory environmental disclosures.

Second, an assumption was made regarding the applicability of European research to United States corporations. Regulatory bodies, accounting requirements, and auditing standards differ between Europe and the United States. Moreover, cultural disparities were not taken into account. Besides Europe's numerous country-specific cultures, Europeans generally appear to be more socially conscious than their American counterparts.

Finally, the systematic review methodology employed in this study has inherent limitations. As a qualitative study, personal judgements may influence the execution of the investigation. Coding may be inductive, whereas assessing article quality and findings necessitates subjective evaluation.

Areas for Future Research

Numerous research opportunities arise from this study's findings, particularly concerning the aftermath of compulsory environmental disclosure implementation. It would be valuable to investigate the actual success factors experienced by companies after producing audited environmental reports. Questions to explore include whether corporate strategy, effective governance, management's environmental attitudes, actual environmental performance, and assurance providers contribute to successful mandatory disclosure. Such investigations could assess the significance of strategic initiatives, elucidate governance roles, and underscore the importance of environmentally-focused organizational leadership.

Additional areas of interest include the consequences of environmental disclosures post-implementation. Investors might find value in examining the impact on share prices and corporate operational performance following the introduction of mandatory environmental reporting. The disclosure of greenhouse gases may lead to their reduction. Consequently, analyzing the effect on greenhouse gas emissions after their disclosure could benefit regulatory bodies and the general public.

Finally, as this study focuses solely on environmental disclosures, its findings and recommendations could be applied to potential disclosure requirements in social and governance areas. Social and governance disclosures are widely reported globally and voluntarily in the United States. This research could provide a foundation for the successful mandatory reporting of social and governance topics, should they become required for disclosure.

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APPENDIX

TABLE 1
SEARCH SUMMARY OF DATABASES USED, STRINGS, AND CRITERIA

Database	String	Inclusion criteria	Number of studies
OneSearch	(audit* or assur*) AND (environment* OR climate* OR "greenhouse gas* or GHG" OR sustain* OR carbon) AND Reporting AND Europe*	Peer reviewed academic journals January 2010–June 2024	52
ABI			107
Total			159

TABLE 2
DATASET DESCRIPTOR

Descriptor	Category	Article Count	%
Total number of studies		**22**	**100**
Publication years	2005–2014	5	22.7
	2015–2019	4	18.2
	2020–2024	13	59.1
Research design	Quantitative	18	81.8
	Qualitative	3	13.6
	Grey	1	4.5
Country origin of data (empirical)	Europe	8	36.4
	France	2	9.1
	Germany	1	4.5
	Italy	4	18.2
	Poland	1	4.5
	Spain	1	4.5
	United Kingdom	3	13.6
Article country of Origin (grey)	Global	1	4.5

TABLE 3
FINDINGS AND RELATED STUDIES

	Finding	Studies
1	Strategic initiatives contribute to the successful implementation of mandatory disclosures.	Al-Shaer, Albitar, and Hussainey (2022); Aureli et al. (2020); Baalouch, Ayadi, and Hussainey (2019); Bartoszewicz and Rutkowska-Ziarko (2021); Chouaibi and Hichri (2021); De Beelde and Tuybens (2015); Dwekat et al. (2022); O'Dwyer and Owen (2005); Fera et al. (2022); Gerwing, Kajüter, and Wirth (2022); Hassan and Ibrahim (2012); Hummel, Schlick, and Fifka (2019); Lombardi et al. (2022); Mazzi, Spagnolo, and Toniolo (2020); Moalla, Salhi, and Jarboui (2021); Moussa, Kotb, and Helfaya (2022); O'Dwyer (2011); Ruhnke and Gabriel (2013); Simnett, Nugent, and Huggins (2009); Simoni, Bini, and Bellucci (2020).
	Total	20 studies
2	Governance plays a key role in implementing mandatory environmental disclosures.	Aureli et al. (2020); Baalouch, Ayadi, and Hussainey (2019); Bartoszewicz and Rutkowska-Ziarko (2021); Bravo and Reguera-Alvarado (2019); Chouaibi and Hichri (2021); Dwekat et al. (2022); O'Dwyer and Owen (2005); Fera et al. (2022); Gerwing, Kajüter, and Wirth (2022); Moalla, Salhi, and Jarboui (2021); O'Dwyer (2011); Ruhnke and Gabriel (2013); Simoni, Bini, and Bellucci (2020).
	Total	13 studies
3	Organisational climate culture and management views towards climate performance are positive disclosure success factors.	Aureli et al. (2020); Baalouch, Ayadi, and Hussainey (2019); Bartoszewicz and Rutkowska-Ziarko (2021); Chouaibi and Hichri (2021); Dwekat et al. (2022); O'Dwyer and Owen (2005); Gerwing, Kajüter, and Wirth (2022); Hassan and Ibrahim (2012); Lombardi et al. (2022); Mazzi, Spagnolo, and Toniolo (2020); Moussa, Kotb, and Helfaya (2022); O'Dwyer (2011); Simoni, Bini, and Bellucci (2020); Somoza (2023).
	Total	14 studies
4	Assurors contribute to successful mandatory environmental disclosures.	Bartoszewicz and Rutkowska-Ziarko (2021); Chouaibi and Hichri (2021); De Beelde and Tuybens (2015); Dwekat et al. (2022); O'Dwyer and Owen (2005); Gerwing, Kajüter, and Wirth (2022); Hummel, Schlick, and Fifka (2019); Lombardi et al. (2022); Moalla, Salhi, and Jarboui (2021); O'Dwyer (2011); Ruhnke and Gabriel (2013); Simnett, Nugent, and Huggins (2009); Simoni, Bini, and Bellucci (2020); Somoza (2023).
	Total	14 studies
5	Firm environmental performance contributes to successful mandatory environmental disclosures.	Baalouch, Ayadi, and Hussainey (2019); Chouaibi and Hichri (2021); O'Dwyer and Owen (2005); Gerwing, Kajüter, and Wirth (2022); Hassan and Ibrahim (2012); Lombardi et al. (2022); Mazzi, Spagnolo, and Toniolo (2020); Moussa, Kotb, and Helfaya (2022); Simoni, Bini, and Bellucci (2020).
	Total	9 studies