

## Article

# Firm-Level Attributes, Industry-Specific Factors, Stakeholder Pressure, and Country-Level Attributes: Global Evidence of What Inspires Corporate Sustainability Practices and Performance

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**Abstract:** This study examined differing attributes that motivate corporate sustainability practices and performance (CSP&P) in the global economy. Utilizing publicly disclosed information from the Carbon Disclosure Project (CDP), data were gathered for publicly listed companies operating in high carbon-intensive and less carbon-intensive sectors on a global scale, and a panel ordered probit regression model analysis was conducted to arrive at the findings. The rigorous reliability and validity of the scales were ensured. Firm-level attributes, industry-specific factors, stakeholder pressure, and country-level attributes were the variables examined for each context. The findings reveal that the firm-level attributes showed that board size, board independence, sustainability committee, and firm size were linked to positive motivation, while firm age was found to negatively influence the response level. The study discovered that the industry-specific factors variable has a negative significant influence because industry leaders (firms in high carbon-intensive sectors) exhibit poor sustainability performance, suggesting a negative attitude towards environmental issues. The study discovered a positive and highly significant influence of stakeholder pressure, while country-level attributes partially played a significant role. Overall, the findings show that a disparity exists in the level of response between the different global economies. The justification for the findings is based on the theory of interested parties, political theory, and legitimacy concerns that shape the strategic choices made by companies.

**Keywords:** Carbon Disclosure Project; corporate governance; consumerism pressure; carbon pricing; extended panel ordered probit; corporate sustainability practices and performance



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## 1. Introduction

Over the years, corporate sustainability (CS) has garnered considerable attention [1], especially as it has been recognized as a dynamic business strategy that may help achieve shareholders' goals and invigorate stakeholders [2]. As a result, corporate activity debates have consistently emphasized the significance of incorporating sustainability strategies into company goals to improve its reputation and performance. In sustainability research, the ability to effectively cope with environmental problems and promote industrial transformation, green innovation (i.e., sustainability), is considered not only a strategic action needed to significantly reduce environmental pollution but one that may also help to facilitate business value for enterprises [3]. In terms of legitimacy, when firms include sustainable principles as part of their core values, it functions as a legitimacy tool that can boost investment opportunities. Moreover, it has been suggested that improved environmental management can excite cost-savings, resulting in increased profitability for firms [4]. This is likely because advances in a firm's perceived legitimacy, as reflected in the improvements made to a firm's environmental reputation or product environmental features, can lead to

increased demand and revenue, consequently offsetting the investment costs [5]. Furthermore, green innovation may assist firms to develop capabilities and competencies that can facilitate sustainable competitive advantage [6].

Despite the enormous benefits, response to sustainability concerns over the years has been very low [7], and research authors have yet to find a consensus on the likely cause. Arguments contend that a variety of factors (internal and external to a company) might influence the amount to which corporate sustainable practices (CSP) are implemented [3,4,8,9]. These characteristics may be derived at the firm, industry, and country levels. At the firm level, corporate governance (CG), company size, and profitability are factors that researchers have argued may influence a company's willingness and ability to invest in SP [10–16]. Meanwhile, the SP of individual businesses is also likely to be shaped by stakeholder demands as well as industry-level characteristics, such as similar operating procedures, pollution abatement, and competitive strategies [14,17–19]. However, as noted by [3], researchers have ignored stakeholders such as customers and competitors as a vital factor necessary to driving CSP. Similarly, debates stress that institutional pressure from government environmental regulation could be of great concern [3], as carbon emission pricing and institutional quality can have an impact on a firm's operating environments and their incentives to engage in SP, which is reflected in their resultant performance [19–22].

Meanwhile, there have been numerous investigations into the possible factors that influence firm SP; however, empirical findings have so far had their focus be one-sided and have had numerous contradictory results. For instance, some existing studies only focused on specific countries (mostly developed countries), regions, or industry sectors [4,9,20,23–25], with the majority of them researching a subset of the drivers [4,9,20,23–25]. In addition, the majority of papers only argue that good corporate governance structure is the most important factor driving firm decisions [8,11,12,26–29]. Some have argued that institutional investors are the core driver [30]. Only a few works of the literature have investigated the influence of the sustainability committee, which is a subcomponent of CG. This could be attributed in part to the fact that firms' sustainability strategies themselves are a growing trend [31,32].

Furthermore, only a few studies [33–36] have looked at the role assumed by activist investors, while studies that research the impact of carbon pricing policies are close to non-existent. To the best of our knowledge, researchers have yet to analyze the impact of all the attributes combined in-depth, other than [4,9]. Both works, however, are deficient in that the former primarily examined the environmental component of sustainability, ignoring the social and governance aspects, while the latter solely looked at the BRICS economies. More importantly, both are lacking in that they failed to consider the impact of consumerism pressure. Hence, this suggests that a knowledge gap still exists about what corporate cultural characteristics drive corporate sustainability performance [7]. Hence, this may be a probable reason for the fragmented and disparate findings obtained so far from the existing pieces of literature.

Following the 2021 report on Sustainable Development Goals (SDGs), had the world fully embraced sustainable living as envisioned by the 2030 Agenda, the world would have been better prepared to tackle the COVID-19 pandemic, which had a devastating impact on human well-being and livelihoods [37]. The need for a coordinated global response is greater now than ever as the pandemic continues to spread, causing dramatic dynamic environmental changes [38]; biodiversity continues to decline, and terrestrial ecosystems are deteriorating at alarming rates. These factors make it imperative to address the current crisis and avert any further danger. Hence, it is pertinent to investigate factors that will encourage corporate response towards sustainable practices and sustainability performance, as companies are major contributors to global greenhouse gases (GHGs). An understanding of this may shed light on reasons for the slow corporate response and why extant works of literature have yet to share a consensus.

Given the dearth in the literature and failure of extant studies in providing insightful explanations as mentioned above, we deemed it highly necessary to examine the differing

attributes likely to influence the SP of firms and to provide answers to some thought-provoking questions that have not yet been answered by extant studies. Specifically, this study examined the extent that individual firm-level attributes, industry-specific factors, institutional pressure, and country-level characteristics influence corporate sustainability practices and performance (CSP&P). Furthermore, we analyzed whether the factors are core predictors of extensive CSP&P. Lastly, we examined whether the relationships between the different attributes are consistent across industries and in the face of different institutional qualities and economic circumstances. The paucity of scholarly literature and thorough studies is reflected in the lack of an elicited scope on the impact of multiple stakeholders and the lack of knowledge about what drives business activities on climate change-related corporate accountability and practices; these are still unanswered questions. We believe that through conducting this research, we will expand the knowledge on the extent of the impact of diverse stakeholders and provide an understanding of what motivates businesses to act on sustainability issues, as reflected in our research aims.

Our study fills these voids not only by complementing extant works in the literature, but also by offering a new perspective on the relative contributions of the presumed internal and external drivers of sustainability strategies; furthermore, we investigated how these factors can influence firms' willingness to adopt sound practices. This research is therefore innovative and unique as it examines CSP&P and its linkage with firm-level attributes, industry-specific factors, institutional pressure, and country regulation. Exploring this nexus is critical for a better understanding of the debate over corporate responses, decisions, and willingness to deal with climate change. The study draws upon the arguments advanced by the theory of interested parties, legitimacy, and political theorists to achieve the research purpose.

Findings from our investigation reveal that corporate sustainability strategies and the willingness of firms to take on the practices are significantly related to the perceived pressures from the stakeholders such as institutional investors, regulators, creditors, and the public. Our investigation revealed that firms are influenced to a significant extent by the activities of their peers from similar industries. Overall, our findings conform to the theory of interested parties, but alone it is insufficient, as the viewpoint is only valid in tandem with other appropriate tenets, given that the study results conform with the arguments espoused by legitimacy and political theorists. In short, our findings confirm that firms make strategic decisions in response to perceived pressures from influential stakeholders with a vested interest in the company to win legitimacy, especially if their survival may be threatened. To convince the interested parties that they value environmental well-being, they adopt sound practices and present extensive information in their reports.

Our research is of relevance and value to the sustainability accounting literature in the context of both developed and developing regions, as most of the prior literature has concentrated on developed countries. The study may therefore spark interest among businesses and countries where sustainability practices, reporting, and other relevant issues have not yet received enough attention.

In addition, our study is timely because it investigates a topic that is currently gaining traction around the world. The study adds to the body of knowledge in several ways. Firstly, we investigated large companies from developed and emerging countries whose activities have a direct or indirect impact on the environment, and which span the 11 industry sectors identified by the Global Industry Classification Standards (GICS). We focused on these companies because investors request them to answer CDP questionnaires due to the toxicity of their activities, suggesting that they heavily contribute to global emissions and thus need to report their carbon activities. They are then graded depending on their response, and the information is presented as a measurement of their sustainability performance. CDP data were used as a measurement of the CSP&P as other research has linked CDP to business accountability for climate change-related disclosures, with further evidence suggesting that institutional investors and regulators play significant roles [39]. Secondly, our research is a large-scale study that examines the nexus between CSP&P and the various

factors that influence a company's propensity to participate in SP. Thirdly, we provide insight into the power that regulators wield through the implementation of carbon pricing policies to encourage businesses to adopt carbon management strategies; this insight reveals the enormous impact of such regulation, particularly in achieving the 2030 Sustainable Development Goals (SDGs). Finally, while other researchers have ignored the influence of stakeholders such as customers and competitors, our findings reveal that consumerism pressure is a vital factor driving CSP, and when activist investor groups own significant and controlling shares in the company, they tend to influence corporate decisions on SP.

The findings from the study have policy implications as well, as it was discovered that regulations increase the visibility of a company's climate change impact and that the perceived pressure from a variety of stakeholders with a vested interest in the company drives companies to implement effective carbon mitigation strategies. Aggressive measures, such as implementing a carbon price or enforcing penalties, also have a positive effect on encouraging businesses to take climate action. Activist investors may need to begin considering corporate sustainability initiatives when drawing up their investment portfolios. This will go a long way to encourage firms to adopt effective measures to curb emissions and consequently facilitate the attainment of the 2030 SDGs.

The rest of the paper is structured as follows. The next section provides the theoretical underpinning, conceptual framework, a review of prior studies, and the hypotheses development. This is followed by the research method. The next section presents the results. Finally, the conclusion, contribution, limitations, and recommendations are presented.

## 2. Theories, Literature Review, and Hypotheses

### 2.1. Theoretical Underpinning

The theory of interested parties, according to [40,41], is founded on the idea that information provided by corporate owners about an organization's commitment to sustainability is strategically used to manage the relationships with interested parties. As a result, the scope of CSP&P will be influenced by the strength and influence of interested parties. This is quite similar to the stakeholder view, where business entities have responsibilities to all other groups who have a vested interest in the business apart from shareholders, and whose primary target is the maximization of their return [42,43]. Because they supply the resources and support for the long-term viability of the business [38], the stakeholders are a crucial concern for any organization that wishes to prosper. Likewise, a critical tool that can support corporate sustainability initiatives, especially in emerging countries, is the voice of stakeholders [44], as the stakeholders essentially demand that businesses actively respond to their value offers. As such, we argue that organizations have different stakeholder groups that have a vested interest. Therefore, the level of pressure and the extent of power wielded by each group determines the extent of the response that firms will give to sustainability concerns according to the demands of each interested party.

Legitimacy theory, which proposes the concept of a "social contract" between the organization and society, argues that organizations tend to legitimize their operations through discretionary disclosure to change public perception [12]. Moreover, because customers are increasingly inclined to buy green products, they can evaluate the legitimacy and reputation of such businesses when they offer eco-friendly products [3]. Linking this to corporate governance, the debate stresses that companies must legitimize their actions to gain wider acceptability in society. As argued by [45], the actions of an entity will be desirable, proper, and appropriate within a socially constructed system of norms, values, beliefs, and definitions. Supporting this, [46] noted that greater environmental disclosure helps to improve corporate legitimacy by maintaining good relations with powerful stakeholders while seeking to gain their support. In line with the forgoing debates, we argue that there is a connection between legitimacy theory and CSP&P. Because of the desire to maintain operating licenses and legitimize business activities, organizations will adopt practices that powerful stakeholders deem relevant.

The political theory is based on the idea that the performance of businesses is influenced by the economic, political, and social environment in which they operate, and that this has a bigger impact on how corporate owners respond to the demands of interested parties [40]. While this perspective stresses that organizations are greatly affected by the environment in which they operate, as a consequence, organizations must adapt to the changes in the environment to ensure sustainability [47]. Proponents contend that several political factors play a mediating role in enhancing the governance and sustainability practices of multinational companies operating in different political settings [9,48]. This is mostly true, as organizations are governed by a web of values, norms, rules, and beliefs that evolve over time and drive firm actions, behavior, and activities to provide legitimate actions [49]. Moreover, governmental sustainable development behavior can also be seen as being integrally tied to the institutional environment, because the government is the representation of an institutionalized political paradigm [43]. In this stance, three forms of institutional pressures (coercive, mimetic, and normative) are crucial to how organizations function and respond to the interested parties' demands [3,47]. Coercive pressure emanates from powerful stakeholders such as the government, regulatory authorities, NGOs, customers, and most suppliers. Coercive pressure occurs when stakeholders exert intense pressure in the form of laws and regulations, sanctions, and punishments [49].

According to [1], normative pressure is generally exerted by a variety of social actors, including academics, social activist groups, institutional financiers, or the media, and they can force companies to adopt new practices [49]. Mimetic pressure, as argued by [3,44], emanates from competitors due to immense peer pressure, especially when companies imitate the practices of competitors who are usually regarded as role models or industry leaders [1]. Competition-derived pressure aids businesses in developing more effective environmental response strategies [44]. Others noted that when firms operate in a similar industry and provide competing products, they tend to imitate their actions with the replication of said action, resulting in 'homogenization' where everybody performs the same measures [9]. An excellent illustration of this is the expanding acceptance of the Global Reporting Initiative (GRI) as the primary corporate reporting guidance by many large-listed firms across countries. The GRI is an initiative that is helping businesses gain a sustainable competitive edge in the global economy as well as shaping the general reporting framework [40].

These complementary theories led us to develop and present the conceptual framework for this research in Figure 1. It suggests that CSP&P is mediated by several factors, including firm-level attributes (such as corporate governance structure, profitability, firm age, and size), industry-specific traits, stakeholder pressure, and country-level attributes, all of which play a significant role in determining how firms respond to sustainable practices and are factors that can be internal or external to the firm.

## 2.2. Prior Studies Review on the Specific Attributes and Hypothesis Development

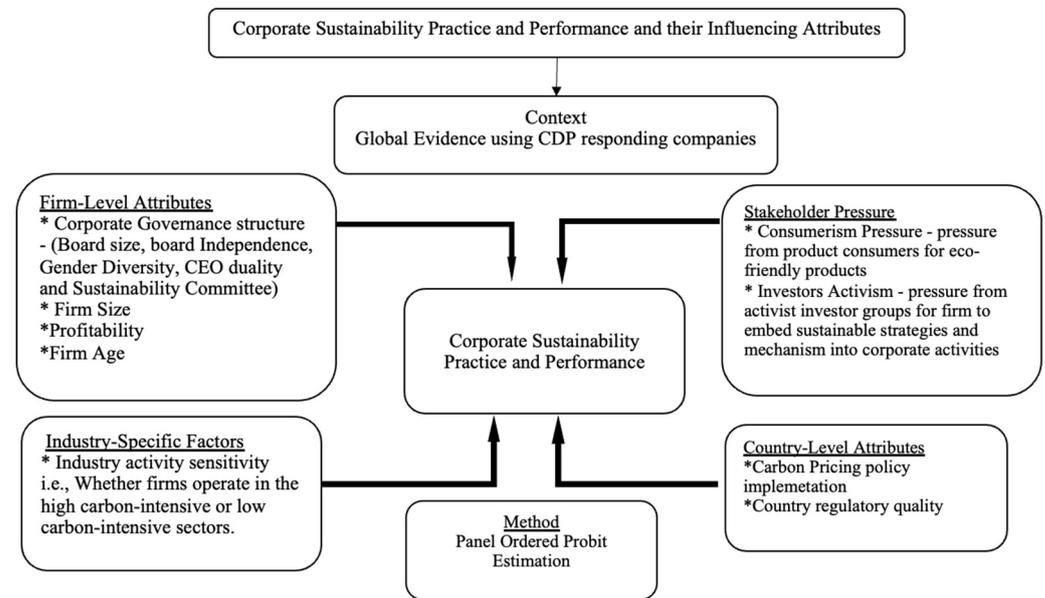
### 2.2.1. Firm-Level Attributes

#### Board Size

Board size is one of the most researched firm characteristics as it equips the firm with the resources it requires to survive [50]. Although there has been controversy around board size [8], the consensus in terms of board effectiveness favors larger boards first and foremost, as they tend to broaden the pool of expertise and diversify board knowledge and abilities [10,11]. This is critical to increasing board independence through the improvement of board leadership and management monitoring [1]. More importantly, the board's diversified knowledge, talent, and expertise will contribute to the company's legitimacy [51]. Second, larger boards are deemed vital to multinational corporations' success when dealing with strategic issues, as it is argued that they greatly profit when their board is made up of a higher number of directors as they can provide needed assistance while making such decisions [52]. Together, these arguments suggest that large organizations with more external links and complex contracts require directors with a variety of skills to help with

strategic decisions such as sustainability. Given the complexity of sustainability concerns, we assumed that larger boards are capable of boosting company decision-making processes, thereby guiding firms on the most effective way to respond to social pressures and the needs of the different interested parties [10]. We therefore hypothesized:

**H1a.** *Larger boards will positively influence CSP&P.*



Source: Developed by the authors

**Figure 1.** Conceptual framework.

### Board Independence

The fundamental responsibility of the board of directors is to oversee and monitor top management, ensuring that they act in the best interests of the concerned stakeholders [12]. However, the proportion of independent directors has been a source of continual debate in the literature. Given the amount of power that directors have over managerial activities, [53] suggests that a higher number of independent directors can help them act as effective corporate watchdogs. It has been commonly argued that independent directors are essential in instances where conflicts of interest are likely to arise, probably because they are less aligned with management as they are not involved in the day-to-day operations and the CEO has less control over them [12]. Furthermore, research has stated that having a larger number of independent directors might improve a company's reputation as they often exhibit a willingness to follow legislation and fulfill corporate social responsibilities [54].

The nexus between CSP&P and board independence is supported by shreds of evidence from empirical works such as [11,23,55–57]. The authors of [23] discovered that entities with a high percentage of independent directors responded better to the CDP, while [11] found that companies with more independent directors have a higher level of stakeholder protection. With this, we hypothesized that independent directors would be better positioned to reflect the demands of interested parties as they are not influenced by dominant groups and have no vested interests in the organization [58].

**H1b.** *Board independence will positively influence CSP&P.*

### Gender Diversity

While many authors have looked at the link between business traits, board diversity, and corporate performance, there has been limited research on how board gender diversity affects CSP&P [26,59]. Gender diversity is an important aspect of CG, as a well-balanced board can help the board function properly. The inclusion of more female

members may calm difficulties in achieving consensus and increase team decision-making effectiveness [59]. Existing studies on gender diversity offer different opinions. For instance, as opined by [59], female board representation enhances corporate governance performance, as they bring diverse leadership talents to the table and are more adaptable in their viewpoints. Thus, they increase communication, lessen groupthink, and enhance the relationships between board members and employees while also enhancing creativity and innovation [11]. As a result, employee productivity increases, and the company's reputation is improved. As per the results of [60], female board members with prior experience in different businesses can provide a variety of viewpoints and professional connections, which can strengthen group cohesiveness and corporate governance. Conversely, the author of [61] argues gender diversity offers little impact on firm sustainability disclosure. Nonetheless, it is widely believed that women directors can reduce agency issues and improve the board's monitoring capabilities, subsequently boosting the company's sustainability growth [59]. Furthermore, countries as of late have begun to enforce legislation requiring the board of directors to be constituted of more women to increase the quality of business governance.

Findings from empirical works of the literature have also been mixed. In the investigation conducted by [62], the authors discovered that having women on the board had a beneficial impact on CSR disclosure. The authors of [59] document evidence that gender and cultural diversity positively affect corporate governance performance but had an insignificant association with social performance. The study conducted by [63] found that gender diversity and nationality had a positive but insignificant effect on corporate sustainability performance. The author of [64] assessed the effects of board diversity on two dimensions of sustainability performance (social and environmental dimensions); the author found that both dimensions of sustainability performance are positively influenced by nationality and gender diversity. On a contrary note, studies conducted by [9,65] found no significant association, while findings by [60] suggest that increased board gender diversity does not have a positive effect on financial and governance performance. The study conducted by [66] purported that women directors and independent directors are negatively related to firm sustainability practices.

In line with the argument that a well-balanced board can help enhance the board's functioning and that a gender-diverse board may boost the company's sustainability growth, we hereby hypothesize that:

**H1c.** *Gender diversity will positively influence CSP&P.*

#### Sustainability Committee

Given their significance in addressing sustainability risks and opportunities, scholars have begun to regard sustainability committees as another governance trait [67]. According to the widespread discussion, an environmental committee that is motivated by legitimacy and reputation management would strive to establish regulations and techniques for monitoring and reporting GHG emissions to mitigate the risks associated with global warming [23]. Another study by [15] claims that having a sustainability committee motivates companies to take socially responsible measures and demonstrates to stakeholders the company's commitment to environmental issues. In addition, empirical studies show that sustainability committees have a positive linkage with business practices, including triple bottom-line reporting [13,23,68,69]. In line with the legitimacy proposition that firms will try to persuade interested parties that they care about the environment and as a result will form a sustainability committee, we hypothesized that:

**H1d.** *Sustainability committee will positively influence CSP&P.*

#### CEO Duality

When a single person serves as both the chairman of the board of directors and the chief executive officer (CEO), this is known as dualizing the function of the CEO [8,54]. According to [70], combining these positions increases the possibility that the CEO will

pursue initiatives that benefit them at the expense of the company. According to the existing literature, there is a negative relationship between CEO duality and corporate environmental disclosures, implying that CEO duality may exacerbate conflicts of interest and hence affect a corporation's transparency process. Furthermore, studies claim that organizations with a CEO who also serves as chairman provide less information on their CSR disclosure [71,72]. Based on these findings, we believe that if the CEO also serves as the chairman, the board's ability to provide advisory and monitoring services may be hindered. Hence, the hypothesis:

**H1e.** *CEO duality will negatively influence CSP&P.*

#### Firm size

Debates remarked that larger entities have a high propensity to respond to the Carbon Disclosure Project (CDP) due to increased scrutiny, intense pressure, and public visibility [23,73]. Similarly, research has claimed that larger firms, due to their huge resource base, have a higher tendency to report on voluntary practices [4]. Moreover, larger firms' awareness of environmental responsibilities would encourage them to voluntarily adopt sound practices more than smaller firms [74] and present a higher disclosure of carbon emissions to prevent undue costs that can arise from information asymmetry [57]. Larger companies typically have a major impact on numerous categories of interested parties due to the geographic diversity and product extent, which is consistent with legitimacy tenets [40].

Existing works in the literature show that a positive correlation exists between firm size and SR [40,75]. Therefore, we hypothesized:

**H1f.** *Firm size will positively influence CSP&P.*

#### Profitability

Because higher degrees of financial success increase the potential for corporate managers to earn the resources needed to engage in long-term company operations, the claim is that highly profitable organizations embrace solid practices to retain their legitimacy [4]. Because large firms have more financial resources than small and medium enterprises (SMEs), their disclosure costs will be cheaper due to the economies of scale [76]. Empirical research has yet to generate a consensus on the relationship between profitability and CSP&P. The authors of [15,77] reveal profitability as a strong determinant of SR, while [40] found that SR is not significantly affected by a firm's profitability, regardless of how well it adheres to the GRI. With the positive claims, we hypothesized that:

**H1g.** *Profitability will positively influence CSP&P.*

#### Firm Age

According to the debate, a firm's age increases the possibility that it is connected with a history of socially responsible actions, and a firm with a long history of previous involvement in environmental practices finds it extremely difficult to withdraw from such efforts when public expectations are already high [4]. Hence, they are compelled to honor socially responsible efforts [2]. Based on this, we proposed:

**H1h.** *Firm age will positively influence CSP&P.*

### 2.2.2. Industry-Specific Factors

A given industry's characteristics are crucial determinants of voluntary disclosures as they tend to influence how business owners react to voluntary actions [78]. Institutional pressures have been argued to push businesses to monitor their competitors and adopt similar behaviors [79], especially when industry leaders who are considered role models practice environmental innovations [4]. As a result, companies operating in related industries under similar regulatory and stakeholder pressures have a higher tendency of engaging in or refraining from similar environmental activities when their competitors do the same [4]. Nevertheless, businesses that uphold their environmental obligations in terms

of production and operation [3] will probably exert pressure on rivals that are hesitant to do the same in the same sector. In other words, institutional influence compels organizations to uphold recognized social norms and fulfil their social obligations. According to [2,32], companies in highly sensitive industries are more likely to engage in sustainability activities for the sake of credibility and legitimacy than those in less sensitive industries. As a result, we anticipate that the level of reaction from businesses to SP will be influenced by the activity of other competitors in the same industry, particularly as a reflection of industry trends.

**H2.** *Industry that a firm belongs to will influence its CSP&P.*

### 2.2.3. Stakeholder Pressures

Corporate responses to sustainability issues are influenced by the sustainability concerns of a growing number of stakeholders, and it is now widely accepted that responsible behavior is necessary for both company survival and success [38,80]. Stakeholder pressure not only helps enterprises understand the preferences of the different interested parties (for example, consumers, competitors, etc.) in terms of sustainability, but also motivates organizations to respond to societal needs and fulfil their social and environmental responsibilities while focusing on economic efficiency [38]. To this end, our study examined consumerism pressure and investor activism as major components of stakeholder pressure.

#### Consumerism Pressure

Because companies have implicit commitments to their society, the expectation is that corporations will endeavor to fulfil their contracts to legitimize business operations [81]. The study conducted by [82] stressed that consumer demand for green products may elicit companies to disclose sustainability information about their products and consequently increase the demand for said product. Similarly, because consumers are increasingly inclined to purchase eco-friendly goods and view environmental preservation as a significant sign when assessing the legitimacy and reputation of businesses [3], it may be assumed that they are a major driver of CSP. Supporting this, the claim is that the customer's behavior and their desire for environmentally friendly products and services led to the adoption of ISO 14001 or Ecolabel standards by organizations [83,84]. Linking this to the political theory's normative isomorphism, the debate noted that consumers can encourage businesses to function sustainably, and as a result, they may acquire environmental certifications such as the ISO 14001 standard [85]. The following findings from the empirical realm [3,38,86,87] document a positive influence of consumerism pressure on SP. Hence, we proposed:

**H3a.** *Consumerism pressure will positively influence CSP&P.*

#### Investor Activism

Activism refers to the measures taken by institutional investors to pressure managers, and it is frequently used as a political maneuver by institutional investors to leverage ownership power [88]. Investor activism, also known as institutional shareholder activism [89], gained traction in financial markets as a result of the growing need for ESG adoption [90]. The debate over the transition to sustainability implies that institutional investors' constraints on corporations may have a significant impact on how far public companies engage in sustainability transitions [91]. Furthermore, scores and ratings supplied by independent organizations such as the CDP provide a platform for investors to encourage firms to adopt ESG management systems and implement sustainable plans [92].

The claims purport that activist investors can elicit a significant impact on company conduct, but the actual evidence to support this is scarce [93]. The study conducted by [35] demonstrated that activist investors forced firms to adopt SP to limit climate change impacts. The authors of [2] record that institutional ownership positively influences CSP. The author of [94] discovered that institutional investor activism is a viable answer to short-term management conduct; conversely, the authors of [95] discovered that shareholder agitation asking for transparency from companies did not result in long-term changes in corporate

behavior beyond the disclosure. In line with [2,35], we believe that if activist investors take a keen interest in sustainability issues, they can greatly influence the firm's SP, mainly because their actions can spark negative reactions in the market, resulting in damage to the company's reputation. Therefore, for continued growth and survival, companies would need to take on a voluntary practice that stakeholders demand so as to legitimize their business. Hence, the hypothesis:

**H3b.** *Investor activism will positively influence CSP&P.*

#### 2.2.4. Country-Level Attributes

Expectations regarding the amount and quality of CSR, including minimum levels and particular requirements for environmental sustainability, are influenced by policies and regulations that exist within a country, as well as the institutional quality [4]. Strict environmental regulations are thought to be a major motivator for businesses to embrace pro-environmental behavior, chiefly because investigations and sanctions on businesses' environmental pollution by any government departments will have a direct impact on the firms' environmental governance level [3], especially when there are governments regulations that prioritize environmental protection. As a result, the regulations effectively oblige the businesses functioning in such a setting to take on environmental obligations and implement green innovation [3]. In a similar vein, the government may adopt mandatory laws and regulations [3,43,96] to strengthen environmental supervision and increase the cost of environmental infractions, among other things. The fear of environmental inspection and sanctions would compel organizations to take on SP to meet the requirements of policies and regulations. However, in nations with underdeveloped institutions, the expected criteria for sustainable behavior may be low, while in countries with sophisticated institutions, they may be high [97].

Although the impact of country legislations on company environmental behavior has been explored in the literature, the relationship is still poorly understood [98]. This is probably because managing environmental issues tends to pose more challenges for the government in different institutions due to the complex and dynamic nature of each social system [43]. Studies such as [4] claim that the effectiveness of implementing SP in any nation is dependent on institutional traits which often differ between high-income, transitional, and low-income nations, or claim that it is dependent on the extent of the influence exerted by the regulatory forces, which can differ between developed and emerging countries depending on whether the regulatory quality is strong or weak [14].

From the empirical data, authors of [74] discovered that the implementation of an emission trading scheme (ETS) enhanced the transparency of carbon disclosures. The authors of [21] claimed that establishing national carbon price policies considerably improves the voluntary environmental disclosure. Furthermore, investigation of [9] also provided evidence that the quality and effectiveness of regulatory legislation have a substantial impact on environmental innovation. To add to the existing body of knowledge, we investigated the influence of carbon pricing to motivate businesses to be more environmentally conscious. In addition, we examined the influence of country regulation (i.e., strong vs. weak regulatory quality) on CSP&P based on the claims that a strong institutional quality may be beneficial in ensuring compliance with sound practices, while a weak institutional quality may impede compliance.

Hence, the hypotheses:

Carbon Pricing Policy

**H4a.** *Carbon pricing policy implementation will positively influence CSP&P.*

Regulatory Quality

**H4b.** *Country regulatory quality will positively influence CSP&P.*

### 3. Research Method

#### 3.1. Data and Sample Consideration

The study population comprises all firms responding to the Carbon Disclosure Project (CDP) questionnaires. The sample was chosen based on the recommendation of [99]. Following the procedure of [99], the final sample comprised 368 companies that answered regularly to the CDP from 2016 to 2019, spanning all industries (GICS) in both developed and emerging countries.

#### 3.2. Source of Data

We used data from the CDP website (publicly disclosed CDP scores) for the study dependent variable “CSP&P.” Explanatory variables data were gathered from a variety of sources, including the S&P Global MI, World Bank Group, and corporate integrated annual reports. Specifically, data on investor activism were sourced from the S&P Global MI, firm-level attributes were obtained from the annual reports and sustainability reports of the individual company, industry-specific factors were based on the CDP activity classification system (see [100]), and country-level attributes were sourced using the World Bank governance indicators and World Bank carbon pricing policies [101]. For further details, refer to Table 1.

**Table 1.** Operational definitions of the research variables.

Variables	Proxy	Operational Definition	Source
<b>Dependent Variable</b>			
<b>CSP&amp;P</b>	Scores, i.e., the publicly published CDP category scores.	Leadership = A, Management = B, Awareness = C, Disclosure = D and Failed = F	CDP Website
<b>Independent Variables</b>			
<b>Firm-level Attributes</b>	Board size	Total number of directors on the board	Annual Reports and S&P Global MI
	Board Independence	Percentage of independent directors to the total number of board of directors	
	Board gender diversity.	Percentage of female board representatives to the total number of board of directors.	
	CEO duality	Dummy variable: 1 if the CEO doubles as board chairman, otherwise 0.	
	Sustainability Strategies/Committee	Dummy variable: 1 for the presence of sustainability committee, otherwise 0.	
	Firm size	Log of the firms' turnover	
	Profitability-ROA	Net income to total assets	
	Firm Age	Age of the firm from the date of incorporation.	
<b>Industry-specific Factor</b>	Industry Sensitivity	Dummy variable: 1 if the company operates a high carbon intensive business otherwise 0.	CDP High-Impact Sector Classification

Table 1. Cont.

Variables	Proxy	Operational Definition	Source
Stakeholder Pressures	Investor Activism (Invhold)	Institutional investors with shares $\geq 3\%$ of the total company equity outstanding.	S&P Global MI
	Consumerism Pressure (ISOEco)	Dichotomous variable: 1 if the business is ISO 14001 certified or has Ecolabels, otherwise 0.	Annual Reports, Stand-Alone Sustainability Report, and Corporate Websites.
Country Regulation	Pricing Policy (carbon policy implementation)	Dummy variable: 1 if a company operates in a country where carbon pricing policy is implemented, otherwise 0	World Bank Group Website
	Regulatory Quality (Instperf)	World Bank Governance Indicator Estimates for political stability, voice and accountability, rule of law, control of corruption, government effectiveness, and regulatory quality.	World Bank Indicators (Kaufmann & Kraay, 2019)
	Year	Dummy variable for each year, corresponding to the period of 2016–2019.	

### 3.3. Measurement of Variables

The operational definitions of the research variables are shown in Table 1. We separated the measurement of the variables into two groups while looking at the hypotheses. First, the dependent variable (CSP&P) was proxied by “Scores”, which are publicly available categorical scores from the CDP, namely leadership, management, awareness, disclosure, and failed level scores. This score level shows how each company performed in terms of its carbon emission control and mitigation techniques. The leadership level has the highest category score, while the failed level has the lowest. The scores have a predefined ordering, indicating that the ordered regression technique is the best match for the data type [102–104]. Furthermore, because the data spans four years (2016–2019) for several organizations (time series and cross-sectional), this is an indication that the data is of a panel nature. Therefore, leadership = 5, management = 4, awareness = 3, disclosure = 2, and failure = 1 were the ordinal dependent variables.

The independent variables, which are divided into four subcomponents, are the second group: (A) Firm-level attributes, which include corporate governance aspects and other firm-specific characteristics. They include “Bsize” for board size [8,48] and “Bind” for board independence [9,11]. Gender diversity is a proxy for the female representation on the board [9,48]. “Suscmtee” represents the sustainability committee [23]. CEO duality represents the chairman and CEO being a dual role [13,23,69]. firm size is a measure of the market size that the firm occupies, which is proxied by “logtover”. Profitability is measured using return on asset (ROA) [9]. Age represents the age of the firm since its incorporation; (B) Industry-specific factors proxied by sensitivity is a dummy variable that denotes whether a corporation works in highly impactful sectors or not. Electric utilities, cement, chemicals, metals and mining, steel, transportation of original equipment manufacturers, and related services are among the most impactful industries, according to the CDP activity sector classification [100]. Highly impactful sectors, in accordance with [105], are industries with high consumer visibility, high political risk, or concentrated fierce competition, whose operations cause greater environmental harm; (C) Stakeholder pressure, investor activism, is proxied by “Invhold”, i.e., the proportion of shares owned by institutional investors with an equity more than or equal to 3% of total company equity. There are arguments that large investors are more effective corporate monitors than small and scattered investors [106].

Consumerism pressure is proxied by “ISOEco” [20]; (D) Country-level attributes: pricing policy is a metric that determines whether or not a government has implemented a carbon pricing policy [20]. “Instperf” is a proxy of regulatory quality that measures whether a country’s regulation is strong or weak. For this, we used World Governance Indices [107] for details.

### 3.4. Statistical Model

The general panel data model is presented as:

$$Y_{it} = \beta_0 + \beta_1 Bsize_{it} + \beta_2 Bind_{it} + \beta_3 Gender_{it} + \beta_4 CEODual_{it} + \beta_5 Suscmtee_{it} + \beta_6 Iogtover_{it} + \beta_7 ROA_{it} + \beta_8 Age_{it} + \beta_9 Sensitivity_{it} + \beta_{10} Invhold_{it} + \beta_{11} ISOEco_{it} + \beta_{12} Pricingpolicy_{it} + \beta_{13} InstPerf + \varepsilon_{it}$$

## 4. Results

### 4.1. Analysis and Interpretation of Results from Descriptive Statistics

Table 2 below presents the descriptive statistics for the study’s dependent variable for 368 firms over the period 2016–2019, for a total of 1472 observations. Of the total observation, 692 operate in emerging countries while 780 are from developed countries. The lowest level of categorical score is one for “fail”, which had the highest overall frequency of 473 (emerging and developed countries), accounting for almost 32% of the total observation. Emerging countries account for the largest share of companies in this score group (351 firms out of a total of 473 firms). This indicates that companies in these markets may have a negative attitude toward sustainable business practices, or that they may have failed to reply to the CDP questionnaire, which allows for a more detailed investigation of the company’s sustainability activities, as the CDP has previously observed [108]. The management category, which is represented by the category score four, had a slightly higher frequency. On this level, there were 321 firms, accounting for about 21.81% of the total observation. The next two categories (level five and three, respectively) were leadership and awareness, with 270 firms accounting for 18.34% of each. Finally, there were 138 firms in category score two for disclosure level, accounting for around 9.4% of the total observations. When compared with emerging countries, firms from developed nations had a higher percentage of frequency in all categories except for the fail level. This shows that the CSP&P in developed countries is considerably improved from those of the emerging-country firms. This supports the earlier findings of [14], which noted that SP levels in developed and developing countries are extremely different because stakeholder concerns are better prioritized in developed countries than in emerging countries; the study conducted by [109] claimed that SP in emerging countries is still relatively on the downside because firms operating in said markets face very little public pressure on sustainability-related issues. Regarding industry sensitivity performance, one would expect that firms in the highly impactful sectors would present better performance than those in the less impactful sector. However, the reverse is the case for our sampled firms. A higher percentage of these companies fared poorly compared with those that did well, resulting in lower scores.

Table 3 below describes the independent variables with a clear distinction between variables that are continuous and categorical. On the leadership level, Bsize had 270 total observations, with the average firm being composed of roughly 11 board members and the board size ranging from a minimum of 5 members to a maximum of 25 members. In the fail category, the average board comprised 9 members, ranging from 3 to 18 members. Given the 1472 total observations, the average firm had 10 board members, ranging between 3 to 25 members. Thus, it is indicative that the typical firms that were analyzed composed of a larger board.

**Table 2.** Descriptive analysis of the categorical dependent variable (CDP Scores).

CDP Category Scores	Score Code	COUNTRIES				
		Emerging	Developed	Freq.	Percent	Cum.
Leadership	5	90	180	270	18.34	18.34
Management	4	125	196	321	21.81	40.15
Awareness	3	83	187	270	18.34	58.49
Disclosure	2	43	95	138	9.38	67.87
Fail	1	351	122	473	32.13	100
<b>TOTAL</b>		<b>692</b>	<b>780</b>	<b>1472</b>	<b>100.00</b>	

**Table 3.** Descriptive analysis of the study's independent variables.

Variables	Categories	Obs	Mean	Std. Dev.	Min	Max
<b>Bsize</b>	Leadership	270	10.93	3.484	5	25
	Management	321	11.19	3.058	5	20
	Awareness	270	10.31	2.777	4	19
	Disclosure	138	9.61	2.601	5	20
	Fail	473	9.16	2.694	3	18
	Overall	1472	10.18	3.052	3	25
<b>Bind</b>	Leadership	270	62.667	21.248	8	100
	Management	321	63.911	22.032	10	100
	Awareness	270	65.493	22.645	0	100
	Disclosure	138	67.323	23.069	0	100
	Fail	473	46.862	20.972	0	100
	Overall	1472	58.814	23.279	0	100
<b>Gender Diversity</b>	Leadership	270	22.033	14.903	0	57
	Management	321	23.999	12.819	0	57
	Awareness	270	24.939	12.592	0	62.5
	Disclosure	138	23.406	13.430	0	58.33
	Fail	473	16.375	14.940	0	62.5
	Overall	1472	21.305	14.356	0	62.5
<b>logtover</b>	Leadership	270	15.865	1.565	11.381	19.217
	Management	321	15.419	1.329	11.652	18.563
	Awareness	270	15.091	1.206	9.694	18.625
	Disclosure	138	14.708	1.906	6.397	17.911
	Fail	469	14.359	1.338	9.762	19.690
	Overall	1468	15.035	1.526	6.397	19.690
<b>ROA</b>	Leadership	270	5.517	6.371	−2.66	62.79
	Management	321	5.129	3.811	−8.08	18.20
	Awareness	270	5.00	4.126	−6.57	26.18
	Disclosure	138	5.361	5.082	−11.30	20.05
	Fail	473	4.469	4.776	−19.07	40.76
	Overall	1472	4.986	4.855	−19.07	62.79

Table 3. Cont.

Variables	Categories	Obs	Mean	Std. Dev.	Min	Max
FAge	Leadership	270	69.02	44.901	12	157
	Management	321	74.84	45.003	12	157
	Awareness	270	76.81	48.308	12	157
	Disclosure	138	64.59	41.351	12	157
	Fail	473	54.30	38.067	12	157
	Overall	1472	66.57	44.094	12	157
Invhold	Leadership	260	44.330	22.608	3.69	97.89
	Management	307	51.727	25.328	7.94	99.81
	Awareness	263	53.182	26.399	3.32	99.70
	Disclosure	131	46.575	27.411	3.36	99.81
	Fail	434	31.572	22.709	3.08	97.21
	Overall	1395	43.868	25.977	3.08	99.81
RegQuality (InstPerf)	Leadership	270	−0.084	1.351	−3.261	1.301
	Management	321	0.120	0.881	−3.261	1.321
	Awareness	270	0.320	0.725	−1.724	1.321
	Disclosure	138	0.329	0.873	−3.261	1.321
	Fail	473	−0.312	0.909	−0.312	1.321
	Overall	1472	$8.073 \times 10^{-10}$	1.000 **	−3.261	1.321
<b>Dichotomous Variables</b>						
<b>CEO Duality</b>		Yes (1)	Percent	No (0)	Percent	Total
	Leadership	79	25	191	16.54	270
	Management	59	18.6	262	22.68	321
	Awareness	48	15.1	222	19.22	270
	Disclosure	39	12.3	99	8.57	138
	Fail	92	29	381	32.99	473
	Overall	317	22	1155	78	1472
<b>Suscmtee</b>		Yes (1)	Percent	No (0)	Percent	
	Leadership	195	24.68	75	11	270
	Management	236	29.87	85	12.46	321
	Awareness	168	21.27	102	14.96	270
	Disclosure	65	8.23	73	10.7	138
	Fail	126	15.95	347	50.88	473
	Overall	790	54	682	46	1472
<b>Pricing Policy</b>	Implemented	Yes (1)	Percent	No (0)	Percent	
	Leadership	209	25.24	61	9.47	270
	Management	213	25.72	108	16.77	321
	Awareness	165	19.93	105	16.30	270
	Disclosure	91	11	47	7.3	138
	Fail	150	18.11	323	50.16	473
	Overall	828	56	644	44	1472

Table 3. Cont.

Variables	Categories	Obs	Mean	Std. Dev.	Min	Max
ISOEco		Yes (1)	Percent	No (0)	Percent	
	Leadership	235	22.25	35	8.41	270
	Management	234	22.15	87	20.91	321
	Awareness	214	20.26	56	13.46	270
	Disclosure	98	9.3	40	9.62	138
	Fail	275	26.04	198	47.6	473
	Overall	1056	72	416	28	1472
Industry Sensitivity		High Impact (1)	Percent	Low Impact (0)	Percent	
	Leadership	194	19.30	76	16.24	270
	Management	221	22.01	100	21.37	321
	Awareness	186	18.52	84	17.95	270
	Disclosure	84	8.37	54	11.54	138
	Fail	319	31.8	154	32.9	473
	Overall	1004	68	468	32	1472

\*\* An indication that the institutional qualities ranged between weak to fairly strong.

The average firm that scored well on leadership had around 63% independent directors, compared with the approx. 47% found for firms that scored at the failed level. The average number of independent directors on the boards of all companies studied was 59%. For all score categories, a large majority of selected firms had a lower female representation, implying that firms were heavily male-skewed. Similarly, just a third of the sampled firms had a dual CEO function, while nearly a high majority (54% overall) of all firms had a sustainability committee. For companies that had a failing score, the results indicate poor attitude by the firms, with little to no plan set to tackle sustainability challenges. Our sampled firms' average turnover was USD 15 million, ranging from USD 6 million to USD 20 million. The majority of the firms were highly profitable, and had an average age of 66 years. We used the 5th and 95th percentiles to winsorize the firm age to account for the confounding effect of outliers, which can significantly alter an estimation if neglected.

For industry sensitivity, more than two-thirds of our sample firms operate in a highly impactful sector, with only 19% reaching the leadership level and around 32% failing. It is sad to see, as one would expect companies in this sector to surpass others to the point where they may serve as role models for those who have not yet adopted the best practices. The implication is that, despite the increased stakeholder pressure and demand for sustainable best practices, many corporations in high-impact industries continue to show little care for environmental challenges.

As for consumerism pressure, ISOEco showed 72% of the overall observation had their activities verified as environmentally friendly, while only 28% did not. As for Invhold, the average value for firms at the leadership level was 44.33%, suggesting that activist investors controlled at least 44.33% of the company equity. Firms that had failing scores had activist investor shares of around 32%.

As for country-level attributes, nearly 56% of the observed firms operate in an environment that has implemented a pricing policy with their performances being relatively similar, while roughly half of firms in countries without similar regulations had a failing score. Regarding regulatory quality, "instperf" ranked between  $-2.5$  and  $2.5$ , with higher values corresponding to strong governance and lower values indicating weak governance [107]; after it was principally composed, it had a mean value of approximately 0 tending towards

the negative (−2.5), indicating that most of the companies operate in an environment with poor regulatory quality on average. Thus, this causes the corporate owners to be more likely to show a negative attitude and less compliance with regulations on the sustainable business practice, of which sustainability is a part.

#### 4.2. Correlation Matrix

Table 4 presents the Spearman correlation coefficients for all of the variables. Except for sensitivity (which showed no correlation) and CEO duality (which had a low positive correlation), the scores showed positive and low significant correlations with all other explanatory variables at the 1% significant level. The correlation between Invhold and Bind was moderately high at 0.45; nonetheless, it is below the recommended threshold of 0.8 [48,110].

**Table 4.** Spearman correlation matrix.

	Scores	Invhold	Bsize	Bind	Gender Diversity	CEO Dual	Sus Ctee	Pricing Policy	Inst Perf	ISO Eco	Sensi-Tivity	Log Tover	ROA	FAge
Scores	1													
Invhold	0.255 ***	1												
Bsize	0.241 ***	0.144 ***	1											
Bind	0.263 ***	0.454 ***	0.071 ***	1										
Gender Diversity	0.175 ***	0.291 ***	0.164 ***	0.424 ***	1									
CEODual	0.05 *	0.001	−0.029	0.033	−0.157 ***	1								
Suscmtee	0.381 ***	0.123 ***	0.217 ***	0.126 ***	0.083 ***	−0.070 ***	1							
Pricing Policy	0.331 ***	0.341 ***	−0.011	0.169 ***	0.073 ***	0.216 ***	0.136 ***	1						
InstPerf	0.191 ***	0.293 ***	−0.04	0.366 ***	0.324 ***	−0.042	0.025	0.397 ***	1					
ISOEco	0.214 ***	−0.204 ***	−0.042	−0.121 ***	0.011	0.057 **	0.173 ***	−0.009	0.077 ***	1				
Sensitivity	0.037	−0.036	−0.104 ***	−0.042	−0.082 ***	−0.061 **	0.094 ***	−0.049 *	−0.061 **	0.236 ***	1			
logtover	0.389 ***	0.090 ***	0.368 ***	0.192 ***	−0.009	0.223 ***	0.197 ***	0.230 ***	0.082 ***	0.111 ***	−0.062 **	1		
ROA	0.075 ***	0.148 ***	−0.049 *	0.038	0.093 ***	0.033	0.017	0.059 **	0.108 ***	0.03	0.127 ***	−0.003	1	
FAge	0.148 ***	0.125 ***	0.161 ***	0.105 ***	0.184 ***	0.114 ***	0.043 *	0.181 ***	0.160 ***	0.059 **	0.060 **	0.281 ***	0.008	1

*t*-test statistics in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.0$ .

#### 4.3. Discussion of Findings

Table 5 depicts the results of our main analysis. To simplify the data and ascertain the combination of elements that influence CSP&P across the major world economies and industrial sectors, we ran several distinct regression models. Model 1 (main model) revealed that the scores were majorly influenced by Invhold, Bsize, Bind, Suscmtee, ISOEco, logtover, and ROA, supporting some of our hypotheses. However, when examined for the individual context, the relationship between the scores and some explanatory variables was not significant, suggesting that factors influencing corporate sustainability practices differ from economy to economy and differ between individual sectors.

Meanwhile, as data is of panel effect, we follow the recommendation to test for endogeneity (a peculiar concern with panel data) before interpreting the results to avoid making incorrect judgments [29,106]. After treating the data for endogeneity, we presented the results in the form of Table 6. Furthermore, when ordered modeling techniques are employed in research, the regression coefficients may only be properly comprehended if they are accompanied by marginal effects to demonstrate the magnitude of the coefficients [29,102,103,111]. Thus, we based our discussion of findings and interpretations primarily on the ERModels (Table 6), backed up by the average marginal effects (Table 7).

Regarding firm-level attributes, Bsize, Bind, and Suscmtee all showed a significant positive association, while CEO Duality showed a significant negative association, as we had speculated. Gender diversity, however, showed no association. Hence, we accept all hypotheses  $H_{1a}$  to  $H_{1e}$ , that they influence CSP&P except for  $H_{1c}$ . Linking the above findings with the political theory, we conclude that firms with larger boards will compose more diverse groups possessing more skills and abilities with which to solve complex problems (e.g., sustainability concerns) and consequently have greater information processing capabilities. Moreover, when a leadership structure is distinguished (i.e., chairman and CEO roles are separately defined), boards can effectively carry out their oversight functions. Overall, our findings add to the findings of [8,11,13,23,51,112,113]. Gender diversity complements [9,65]. A plausible reason could be likened to the majority of the examined

firms being predominantly male-skewed, having less than 30% female composition. Hence, this raises a critical question of whether women play merely a token role.

**Table 5.** Panel ordered probit regression results.

CDP Scores	Before Endogeneity Treatment				
	General Model	Developed Economy	Emerging Countries	High Impact Industry	Low Impact Industry
Invhold	0.0141 *** (3.03)	0.0067 (1.20)	0.0070 (0.78)	0.0095 * (1.67)	0.0228 ** (2.46)
Bsize	0.0905 *** (2.77)	0.0506 (1.20)	0.1727 *** (2.91)	0.0829 ** (2.07)	0.1284 ** (2.06)
Bind	0.0236 *** (4.54)	0.0119 ** (2.12)	0.0442 *** (3.91)	0.0274 *** (4.02)	0.0199 ** (2.25)
Gender Diversity	−0.0039 (−0.61)	0.0006 (0.08)	−0.0053 (−0.47)	−0.0037 (−0.47)	−0.0035 (−0.30)
CEODual	−0.0449 (−0.15)	−0.4066 (−1.31)	0.9368 (1.52)	−0.0905 (−0.23)	0.0338 (0.07)
Suscmtee	1.3568 *** (5.75)	0.7950 *** (2.96)	2.5143 *** (5.38)	1.8377 *** (5.34)	0.7350 ** (2.00)
PricingPolicy	−0.0993 (−0.65)	0.3221 (1.06)	−0.5349 *** (−2.81)	−0.1869 (−0.99)	0.0260 (0.10)
InstPerf	−0.0476 (−0.34)	0.1526 (1.33)	−0.3291 (−1.50)	−0.0444 (−0.25)	−0.0258 (−0.10)
ISOEco	1.1122 *** (4.00)	0.7717 ** (2.10)	1.0578 ** (2.33)	1.2673 *** (3.34)	0.8679 * (1.93)
Sensitivity	0.1104 (0.38)	0.1609 (0.50)	0.3021 (0.56)	−	−
logtover	0.5172 *** (5.41)	0.5620 *** (4.99)	0.4417 ** (2.44)	0.4893 *** (4.26)	0.6031 *** (3.09)
ROA	0.0361 * (1.77)	0.0225 (0.95)	0.0222 (0.60)	0.0291 (1.22)	0.0693 * (1.66)
FAge	0.0017 (0.60)	−0.0020 (−0.66)	−0.0083 (−1.08)	0.0038 (0.95)	−0.0008 (−0.15)
cut1_cons	11.1481 *** (7.99)	9.1752 *** (5.63)	12.7430 *** (4.59)	11.1103 *** (6.74)	12.5002 *** (4.47)
cut2_cons	12.0777 *** (8.61)	10.3227 *** (6.29)	13.4215 *** (4.83)	11.9433 *** (7.21)	13.7012 *** (4.86)
cut3_cons	13.4831 *** (9.54)	11.8106 *** (7.15)	14.6909 *** (5.26)	13.3423 *** (8.00)	15.1807 *** (5.35)
cut4_cons	15.2048 *** (10.67)	13.3626 *** (8.02)	16.7865 *** (5.95)	15.1241 *** (8.95)	16.8465 *** (5.91)
N	1393	756	637	949	444
n	353	190	163	241	112
Years	4	4	4	4	4
Log Likelihood	−1415.87	−862.31	−515.60	−958.60	−449.06
Wald Chi <sup>2</sup> (12)	167.31 ***	70.82 ***	87.76 ***	111.81 ***	52.35 ***
AIC	2867.45	1760.63	1067.19	1951.21	932.13
BIC	2961.75	1843.93	1147.41	2033.75	1001.76
Pseudo R <sup>2</sup>	0.3429	0.2770	0.4072	0.3447	0.3485

*t*-test statistics in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Table 6.** Extended regression models for the endogenous covariates.

Extended Panel Ordered Probit	(After Endogeneity Treatment)		
	ERModel 1	ERModel 2	ERModel 3
CDP Scores			
Invhold	0.0158 *** (8.51)	0.0032 ** (2.04)	0.0130 *** (5.98)
Bsize	0.6469 *** (28.99)	0.7213 *** (30.85)	0.6363 *** (27.48)
Bind	0.0136 *** (7.00)	0.0070 *** (3.92)	0.0109 *** (5.15)
Gender Diversity	0.0006 (0.20)	0.0038 (1.18)	−0.0011 (−0.31)
CEODual	0.1322 (1.25)	−0.2144 ** (2.01)	0.2681 * (1.92)
Suscmttee	1.0133 *** (10.84)	0.9147 *** (11.60)	1.1802 *** (11.06)
Pricing Policy	0.1174 (1.37)	0.2529 *** (3.44)	−
InstPerf	0.0660 (1.31)	−	−0.0587 (−0.88)
ISOEco	0.9827 *** (8.85)	0.2373 *** (2.69)	0.6655 *** (4.48)
Sensitivity	−0.2389 ** (−2.32)	−0.2109 *** (−2.81)	0.6033 *** (3.66)
logtover	0.7612 *** (22.64)	0.6304 *** (14.91)	0.7302 *** (17.10)
ROA	0.0059 (0.58)	0.0296 *** (3.48)	−0.0056 (−0.47)
FAge	−0.0022 *** (−0.64)	−0.0019 *** (−2.65)	−0.0010 (−0.96)
cut1_cons	7.9068 *** (26.07)	7.9661 *** (26.35)	8.0221 *** (21.18)
cut2_cons	8.5262 *** (27.51)	8.5194 *** (28.14)	8.6772 *** (22.65)
cut3_cons	9.5101 *** (29.59)	9.3897 *** (30.62)	9.7054 *** (25.32)
cut4_cons	10.7908 *** (31.35)	10.4738 *** (32.95)	10.9441 *** (28.00)
N	1393	1393	1393
n	353	353	353
Years	4	4	4
Log Likelihood	−3998.43	−3988.86	−4001.62
Wald Chi <sup>2</sup> (12)	1017.42 ***	1224.31 ***	962.30 ***
AIC	8042.86	8021.72	8047.25
BIC	8163.36	8136.98	8162.51
corr(e.Bsize,e.Scores) 1	−0.6439 *** (−22.19)	−0.7292 *** (−28.27)	−0.6205 *** (−19.23)

*t*-test statistics in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . <sup>1</sup> The correlation estimates corr(e.Bsize,e.Scores) is the endogeneity detected in the main model. We reject the hypothesis of no endogenous selection, as the estimate is significant. Similarly, because it is negative, we conclude that there are unobserved factors that occur which increase the likelihood of inclusion in the sample, where the unobserved factors decrease the score of the firm. An implication is that Bsize is an endogenous variable having a strong relationship with the error term.

Table 7. Average marginal effect for ER Model 1.

Variables	Fail	Disclosure	Awareness	Management	Leadership
<b>Invhold</b>	−0.0025 *** (−9.01)	−0.0004 *** (−6.90)	−0.0002 *** (−5.07)	0.0008 *** (7.52)	0.0024 *** (8.73)
<b>Bsize</b>	−0.1021 *** (−24.83)	−0.0183 *** (−10.35)	−0.0091 *** (−6.06)	0.0329 *** (10.85)	0.0970 *** (24.59)
<b>Bind</b>	−0.0021 *** (−7.23)	−0.0004 *** (−6.39)	−0.0002 *** (−4.73)	0.0007 *** (6.87)	0.0020 *** (7.01)
<b>Gender</b>	−0.0001 (−0.20)	−0.00002 (−0.20)	−0.0000 (−0.20)	0.00002 (0.19)	0.0001 (0.20)
<b>Diversity</b>	−0.0208 (−1.25)	−0.0037 (−1.24)	−0.0019 (−1.22)	0.0067 (1.24)	0.0037 (1.25)
<b>CEODual</b>	−0.1598 *** (−12.19)	−0.0286 *** (−7.95)	−0.0142 *** (−5.13)	0.0515 *** (8.44)	0.1512 *** (11.62)
<b>Suscmtee</b>	−0.0185 (−1.36)	−0.0033 (−1.38)	−0.0016 (−1.38)	0.0060 (1.37)	0.0175 (1.36)
<b>Pricing Policy</b>	−0.0104 (−1.31)	−0.0018 (−1.34)	−0.0009 (−1.34)	0.0034 (1.35)	0.0098 (1.31)
<b>InstPerf</b>	−0.1551 *** (−9.18)	−0.0277 *** (−6.50)	−0.0138 *** (−4.84)	0.0500 *** (6.67)	0.1467 *** (9.17)
<b>ISOEco</b>	0.0377 ** (2.36)	0.0067 ** (2.38)	0.0034 ** (2.20)	−0.0121 ** (−2.46)	−0.0357 ** (−2.32)
<b>Sensitivity</b>	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
<b>logtover</b>	−0.0009 (−0.58)	−0.0002 (−0.58)	−0.0001 (−0.57)	0.0003 (0.58)	0.0009 * (0.57)
<b>ROA</b>	0.0003 *** (2.60)	0.0001 *** (2.57)	0.00003 (2.40)	−0.0001 *** (−2.62)	−0.0003 *** (−2.58)
<b>FAge</b>					
<b>N</b>	<b>1393</b>	<b>1393</b>	<b>1393</b>	<b>1393</b>	<b>1393</b>

*t*-test statistics in parentheses \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

We discovered a positive significant relationship for firm size, while profitability was only positive under ERM 2, confirming hypothesis H1f and partially confirming H1g. This result, therefore, builds up previously expanded arguments that larger firms that are also economically successful due to their visibility will adopt SP to avoid public scrutiny and to persuade the public of their actions concerning sustainability issues. Therefore, the result observed for profitability lends credence to the prior findings of [114] that the linkage between ESG conduct (sustainability) and financial performance is not straightforward. FAge, on the other hand, exhibited a significant negative correlation, hence rejecting H1h. The implication is that as a company grows older in the market, it begins to assume it has gained sufficient momentum and renown because the public already believes its practices as ethical, and as a result, they show less concern for sustainable operations.

Regarding industry-specific factors, we discovered a significant negative association. Hence, we accept H2. A possible explanation is that majority of the sampled firms operating in the highly impactful sectors performed extremely poorly. The poor attitude by this group of firms might have sparked negative reactions from other sectors whose activities pose a lesser threat and who would have been willing to take on the practice. Contrary to the results displayed, the expectation was that firms in highly impactful sectors would show more concern for societal well-being given the persistent stakeholder pressure and constant awareness initiatives from different groups such as the United Nations through the SDGs. To this end, our findings support the mimetic isomorphism of political theory that institutional pressure exerts influence on the extent of firm behavior. Accordingly, we argue that because firms whose activities threaten environmental well-being and are likely industry leaders that show little to no concern for the damage caused to the environment, others have followed in their footsteps, emulating and imitating those whom they look up to as role models. This is evident from the descriptive analysis, which found that around 32% of the firms in the highly impactful sector had a performance score of fail

compared with the 19% that had a leadership score. Our results support the claims that companies in the high carbon sectors frequently exhibit an attitude that suggests they may be unconcerned about carbon disclosure and performance.

Regarding stakeholder pressure, the result for ISOEco demonstrated a positive and significant association with the score. Thus, we accept  $H_{3a}$ , which implies that consumerism pressure has a significant impact on CSP&P. Our findings are consistent with those of [20,83,87,115,116], but contradict [73,117]. From all three ERModels, Invhold positively and significantly influences scores, suggesting that activism by institutional investors can drive corporate willingness in terms of contribution to SDGs, rendering support to the prior findings of [118] but conflicting with [8,95,119]. Therefore, we accept  $H_{3b}$ . In line with shreds of evidence from prior authors, we conclude that activism by investors, especially by those who are actively involved in the company and possibly have long-term investment horizon, will enhance the SP that are enacted. Overall, our study result led credence to the debate that stakeholder pressure can influence CSP&P to a larger extent, which supports the findings of [38] in conformity with the theory of interested parties and the coercive isomorphism of institutional pressure from the realm of the political theorist. It further lends credence to the legitimacy theory in that to legitimize business relationships and ensure business survival, companies would strive to fulfil stakeholders' demands by taking on voluntary practices to convince vested stakeholders that the firms are environmentally conscious.

Regarding country-level attributes, we found that pricing policy has a positive significant association with the scores (ER model 2), indicating that carbon pricing policy has a considerable impact on CSP&P. The result gives support to the research hypothesis  $H_{4a}$ , which predicts that firms operating in a country with a pricing policy have a higher tendency to adopt SP than those operating in an environment where the policy has yet to be enacted. Our results conform with the studies of [20,21,120–122]. Instperf, which measured the regulatory quality, had no substantial impact. As a result, we reject  $H_{4b}$ . A possible explanation is evident from the preliminary result displayed in the descriptive statistic where, on average, sampled firms operate in nations with regulatory qualities ranging from minimally good to relatively weak. As a result, their influence was small. The outcome, in this case, is incongruent with [19,46].

Overall, we find that operating in a country that has implemented a carbon pricing policy has a considerable effect on CSP&P. However, given the lack of further constraints, the effect could be hindered by low regulatory quality. This is consistent with the political theory, which claims that jurisdictional characteristics influence corporate behavior, with strong institutions having a positive impact and weak institutions having a negative impact.

#### 4.4. Average Marginal Effects and Interpretation

Based on the average marginal effect in Table 7, we interpret that (e.g., “Bsize”) a unit increase (decrease) in the board composition will more likely raise (reduce) score. As a result, if the board size increases, the firm will be more likely to attain management or leadership scores and be less likely to receive a fail score. All variables have similar interpretations, with positive signs (+) implying a higher likelihood of occurrence and negative signs (–) implying a lower likelihood of occurrence.

#### 4.5. Sensitivity and Post Estimation Analysis

To prevent drawing invalid inferences and to ensure the reliability and validity of our findings, the authors carried out necessary sensitivity tests. Firstly, following the recommendations from [103,106], we tested and discovered that endogeneity is a cause for concern, and tackled the issue using STATA ERModels for endogenous covariates [123,124]. Multicollinearity was not an issue as the correlation coefficients among the explanatory variables were low and below the threshold of two [125], and the variance inflation factors (VIFs) had a value of 1.31 (See Table 8 below). The Wald  $\chi^2$  test was significant at 1%,

indicating the goodness of fit of the models; meanwhile, the lower Akaike and Bayesian Information Criterion (AIC and BIC) further indicate the robustness of the models [126].

**Table 8.** Variance Inflation Factors (VIFs).

Variable	VIF	1/VIF
Inehold	1.56	0.642420
Bind	1.53	0.652440
Gender Diversity	1.49	0.671839
logtover	1.48	0.673420
InstPerf	1.34	0.746805
Bsize	1.33	0.749528
Pricing Policy	1.33	0.750771
ISOEco	1.25	0.801027
FAGE	1.21	0.823963
CEODual	1.18	0.846391
Suscmtee	1.16	0.865288
Sensitivity	1.12	0.891937
ROA	1.05	0.953991
Mean VIF	1.31	

## 5. Conclusions, Contribution, and Limitation

This study investigated which factors encourage corporate response towards sustainable practices (SP) and started by examining the varying attributes of the firm-level, industry-specific, stakeholder pressure, and country-level attributes. The study used a global sample of CDP data from responding companies operating in different sectors, with varying levels of institutional quality characteristics during the period of 2016–2019 and spanning developed and emerging countries. With the application of a distinct technique (ordered regression modeling), we discovered that CSP&P largely depends on some firm-level attributes, consumerism pressure, and investor activism. These factors prove the legitimacy tenets and theory of interested parties. We found that industry practice and norms influence to a greater extent how firms perceive and react to sustainability concerns. Furthermore, the level of pressure mounted by powerful stakeholders will motivate managers to be innovative while developing and designing environmentally friendly strategies and products. Moreover, we found that country-level attributes (pricing policies and regulatory quality) play an important role in driving CSP&P. This result proves the political theory that organizational performance depends on the economic, social, and political environment where the firm operates, which equally determines how said firm responds to the needs of the interested parties. Our findings suggest that these factors are both complementary and core to shaping corporate decisions and responses. As a result, they may collaborate to improve business sustainability performance. Our results contribute to the literature by providing empirical evidence on how organizations' decisions are affected by various stakeholders, especially by those with a vested interest in the company. Based on these findings, the board structure can be identified as a vital instrument in determining CSP&P as well as stakeholder influence. To win legitimacy, larger firms due to public scrutiny and their visibility have a higher tendency to strive to improve on their sustainability practices.

Even though our empirical research's findings did not demonstrate a strong correlation with profitability, we still think that a sincere dedication to corporate sustainability would soon produce fruitful results. Based on the result of our investigation, we conclude that a significant amount of dedication is required to realize the long-term goal of sustainable development. Hence, to accomplish a variety of performance goals, we hereby encourage businesses to increase their investment in sustainability and incorporate sustainability into their strategic planning. By doing so, they can raise their overall performance, especially when sustainability is characterized by excellent visibility.

Our study contributes to knowledge by offering an in-depth explanation of the critical role of consumerism pressure and activist investors in influencing a company's sustainability policies. It also broadens the understanding of how different measures might influence business sustainability strategy decisions. As a result, several indicators, such as government influence in the form of isomorphic pressure, should be used to achieve greater transparency, improved business performance, and a higher quality of SP.

The study's theoretical implications illustrate the indirect impact of legitimacy and political theory on business sustainability behavior, with the theory of interested parties offering further explanations. In general, the theoretical implication of the study shows that CSP&P is more dependent on the political, social, and economic circumstances of the region in which it operates, which affects organizational conduct and how the companies react to the needs of the interested parties. Furthermore, because information from sustainability reports will be required for companies to manage their connection with these interested groups, their sustainability performance will be based on the strength and influence of the interested parties. The findings, therefore, have implications for investors, managers, and regulatory authorities on a global scale. Activist investors may need to begin considering corporate sustainability initiatives when drawing up their investment portfolios, as this can go a long way for encouraging firms to adopt effective measures to curb emissions and consequently facilitate the attainment of the 2030 SDGs. Managers, on the other hand, need to improve their reporting by ensuring that reports capture the significant sustainability indicators for which the firm engaged in over the year. Similarly, policymakers and regulatory agencies in the global village must develop aggressive measures, such as implementing a carbon price or enforcing penalties, as it has been shown to have a positive effect on encouraging businesses to take climate action; as such, they must build tools to assist businesses in maintaining strong SP, and they must examine firm sustainability strategies and policies to ensure that they are well-written, accurately determined, confirmed, and thoroughly implemented.

The present study is not without limitations. Because the majority of the companies from the emerging countries had not been responding to CDP in earlier years, our dataset only spans the four years from 2016 to 2019. The sample also comprised relatively larger multinational corporations, which future studies must be cautious not to generalize the findings to smaller businesses. While our study examined developed and emerging countries, future research may conduct a comparative study to examine the SP of different countries and/or regions. Likewise, a comparative study could be conducted between firms operating in different industrial sectors. The differences between the industrial sectors may reflect the industry's visibility because of the environmental impact of their activities and the standard of the institutions found in countries where companies in these industries have a greater share of the market due to the economic, social, and political features of the location.

## 6. Recommendation

Even though the current study covered a wide range of factors affecting CSP&P, other attributes such as development potentials, technological advancement, cash flow, and innovation can also influence CSP&P. Therefore, it is a good avenue for future research to explore these other attributes. In a similar vein, it is strongly advised that future research investigate the greenwashing practices of corporate owners, given that the findings regarding the sustainability performance of the companies operating in the high-impact sectors and prior reports that a high percentage of companies' sustainability claims do not complement their actual performance.

Meanwhile, it is strongly advised that organizations work to increase the proportion of women on their boards and make sure they are free from management influence so that they may effectively carry out their supervising duties and contribute to the success of the company. Similarly, while we stress that the relationship between the profitability of the firm and CSP&P is not straightforward, we recommend that future research focus on

a similar scope to focus on balancing all of the components necessary to harmonize and achieve financial performance.

In addition, implementing sustainability policies is a crucial step for governments to reverse the existing global situation of GHG emissions, as sustainability is a topic of considerable concern on a global scale. Meanwhile, governments face significant difficulties in handling sustainability issues due to the complex and dynamic nature of each social system. As a result, considering the unique conditions of each location, it is advised that the government establish various sustainability policies that would match both the local and national circumstances, and increase the general public's capacity to take a more active role in sustainable development. Doing so would facilitate the achievement of sustainable development and economic growth. Even though our study has examined a variety of factors influencing corporate decisions for sustainability into account, future research agendas may examine the cost-benefit ratio of implementing each country-level, industry-level, and firm-level policy to promote higher levels of sustainability performance.

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