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EXAMINING THE LINK BETWEEN CORPORATE GOVERNANCE AND FINANCIAL PERFORMANCE IN THE ERA OF CLIMATE CHANGE

Aws AlHares

Department of Accounting and Finance, Prince Mohammad Bin Fahd University, Kingdom of Saudi Arabia

aalhares@yahoo.co.uk

ABSTRACT

The growing concerns about climate change pose challenges for companies in aligning long-term environmental goals with short-term financial performance. This paper empirically investigates its relationship with financial performance. Using a balanced panel of 6,300 observations from 630 multinational firms across the Organization for Economic Co-operation and Development (OECD) 10 countries over 10 years (2015–2024). The analysis is comprehensive with regards to the practical and theoretical components and implications of climate governance. Results indicate that companies that have better climate governance are likely to perform better financially while higher levels of climate performance enhance the strength of this relationship. When investor ownership is long term as well as homogeneously distributed, such governance is more effective still. The results have supported the findings that proper resource utilization for robust climate governance mechanisms contributes to financial performance. It also reveals a moderate link between climate performance and the joint role of climate governance and financial performance. It shows how long term institutional investors have affected the adoption of climate governance principles. Based on the Resource Based View (RBV) and agency theories, the research illustrates the necessity for finding the best way to use resources and developing investor relationships in order to secure better financial results. Finally, the study offers important insights to help incorporate sustainability practices within the corporate governance frameworks as well as theoretical and practical contributions to the field.

Keywords: *Corporate governance; Financial performance; Climate change; Resource-based view; Environmental performance*

INTRODUCTION

Currently, the humanity is facing growing concerns about climate (Busch et al., 2022; Cosma et al., 2022), mainly due to human made environmental destruction, which threatens the ecosystems and human life (IPCC, 2007). On businesses, it has a great impact on their long term vision and strategic planning (Charumathi & Rahman, 2019; Kavadis & Thomsen, 2023). There is greater pressure on companies to formulate responses to tackle environmental risks (Daradkeh et al., 2023; Maris & Flouros, 2021) as shareholders express increased interest in climate change ramifications to their investments (Calvet et al., 2022; Krueger et al., 2020). Furthermore, this concentration on addressing issues of both internal and external dimensions of climate change influences corporate priorities and decision making (Damert & Baumgartner, 2018).

As written in the previous paragraph, but increasingly emphasized by the growing concern over climate change mainly due to human damaging environmental norms (IPCC, 2007) will sooner or later change some ecosystems and corporate

sustainability. These challenges have a huge impact on the business's long term strategies, especially its financial performance (Charumathi & Rahman, 2019; Kavadis & Thomsen, 2023). With increasing global stakeholder pressures to hold corporations accountable in their sustainability, there is an increasing need for businesses to align with environmental performance objectives with financial objectives (AlHares et al., 2022; Calvet et al. 2022, Krueger et al. 2020). As a result, business strategies that create environmental and financial value have arisen (Aibar Guzmán et al. 2022). Environmental performance and finance have been studied independently in the previous studies (Gull et al., 2022; Huang, 2021). Although a limited amount of research focuses on the impact of climate governance institutions to financial performance. In addition, the extent to which institutional investors can help influence effective climate governance has not been fully investigated. This thesis closes this gap by looking at whether the integration of a climate change initiative within the structure of the corporate governance of a firm leads to better financial results. Additionally, this will examine the impact of long term institutional ownership in enhancing the significance of the link between climate governance and financial performance.

However, there is an emerging concern about whether to integrate climate change with corporate governance practices in order to improve the effectiveness of the firm's mitigation actions on climate risks (Goud, 2022; Haque et al., 2016; Kavadis & Thomsen, 2023). Therefore, this means the company's focus on sustainable practices is marked by a high interest on the adaptation of climate change governance practices (Bui et al., 2020).

There is research carried out on the relationship between corporate governance and financial performance (Bhagat & Bolton, 2019; Kyere & Ausloos, 2021). Also, the survey of how the relationship of corporate governance is impacting corporate sustainability (Enciso-Alfaro & García-Sánchez, 2023; Guerrero-Villegas et al., 2018; Ludwig & Sassen, 2022) has been empirically studied to realize the link of climate change governance structure on the financial performance, but it is considered as insufficient to provide a clear perspective on how environmental sustainability shall be addressed from a governance aspect and have a feasible structure that anticipate the climate change (Aguilera et al., 2021; Velte, 2023). This is because this paper seeks to form an understanding about the relationship of climate governance and the company financial performance, therefore, it aims to position climate governance influence on the company financial performance. This aims to cheque if the corporate governance structure supports the climate change governance to be aligned with a company's actions for bettering the company's financial performance. The study also looks at how institutional ownership affects companies to adopt climate governance structures which in turn gives rise to such an offset.

It will also look into the effects that the company's climate performance has on the relationship between climate governance and financial performance. The following questions will be answered in particular in this study:

(i) Is climate governance associated with higher financial performance?
(ii) Does institutional ownership affect climate governance?
(iii) Does climate governance affect financial performance moderated by climate performance?

The distinctive aspect of this research is that it makes use of a particular mechanism driven by the focus on a combination of factors through common corporate governance mechanisms and climate change long and short term factors (i.e., climate governance). This structure allows the companies to upload companies' climate change commitments and the obligations of enhancing firms' financial performance, of which this structure has positive effects in the governance structure on climate change (Cosma et al., 2022). In order to address issues affecting people and the planet and simultaneously improving profitability, the corporate governance mechanism is necessary (Mayer, 2019). Focusing on these mechanisms allows companies to take appropriate action for a response to immediate environmental and social challenges

(Kavadis & Thomsen, 2023; Ludwig & Sassen, 2022; Velte, 2023). Additionally, financial performance and climate governance relationships were utilized by Velte (2023) with empirical evidence and how moderators and mediators affect climate governance.

This is one of the first studies to investigate the connection between climate governance, and the company's economic, and climate change performance. Unlike the previous studies on the corporate governance moderated relationship, this research considers climate governance as a direct link between the financial and environmental performance. We expand the knowledge about the interplay of owners' preferences and voices in corporate governance practices and responses specifically on climate change (Aibar-Guzmán et al. 2022) to shed light on the impact of institutional ownership in corporate governance practices and responses. Moreover, this approach presents a response to an issue that has been raised by Velte (2023) in relation to the nature of the connection between institutional ownership and its functionality on the company's financial performance (Velte, 2023).

The emphasis on short term practices in current corporate governance frameworks creates inconsistency in analyzing the relationship between governance and climate change (Benjamin & Andreadakis 2019). The role of corporate governance is fundamental to embed climate change as a governance concern, and to create a firm's framework to address the climate change problems in a structured manner (Gallego Alvarez & Pucheta Martinez, 2022). Yet, climate considerations fail to be efficiently incorporated in the decision-making process using traditional governance mechanisms (Cosma et al., 2022).

While certain initiatives, for example, involving efforts to include climate change in governance frameworks, through the focus on diversity and independence of the board (Bui et al., 2020), have not yielded great results in promoting the climate issue. It is important to integrate climate change aspects i.e. strengths, weaknesses, opportunities, threats and risks into governance mechanisms (Goud, 2022). The integration of climate change efforts with a company's short term corporate profitability goals in the real world is performed, taking into consideration the complexity involved in the association of climate governance and the financial performance (Benjamin & Andreadakis, 2019).

A few authors have suggested techniques to improve such governance practices related to climate change. Amongst these lies to assign additional responsibilities to the boards of directors including creation of the climate change committees to address the emerging issues and to aid in making the better decisions (Bui et al., 2020; Cosma et al., 2022; Luo & Tang, 2021; Principale & Pizzi, 2023). Such committees, which are usually backed by company management, help to deal with the environmental responsibilities (Damert & Baumgartner, 2018; Haque, Islam, Yan, & Khan, 2016). In addition, climate actions and targets incentivized for management positions work effectively (Haque, 2017; AlHares et al., 2023; Kock et al., 2012; Ludwig & Sassen, 2022).

Furthermore, policies need to be developed to strengthen the environmental metrics of climate change governance (Galbreath, 2010; AlHares et al., 2023), as well as promoting transparency in ecological performance reporting (Bui et al., 2020; Haque & Deegan, 2010). Taken together, these measures reinforce the corporate governance function in handling climate change issues without compromising on the organizational goals..

Literature Review and Hypothesis Development

This research article mainly discusses two main theories. The respective agency theory and Recourse based theory (RBV).

The RBV theory is widely used by corporations and companies in strategic management. It also explains how through effective channeling and use of resources an organization can enhance the profit of the organization. RBV is concerned with the operational aspect of the companies without making many assumptions on the decision making process itself. It determines capabilities of an organization pertaining to poor resources, like talented people or technology assets (Raduan et al., 2009). It provides the decision makers to tactically think their

organization's resource constraints, before making the strategic decisions. It also emphasizes certain parameters that stakeholders should pay attention to in order to be able to properly employ these resources. RBV argues that for companies to become profitable or an advantaged position in the market, the strategic decisions have to revolve around the optimal use of the resources available. Moreover, the successful utilization of these resources requires continuous monitoring (Kaufman, 2015). Nevertheless, as would be the case with any theory, RBV also has its practical application limitations and challenges. This is because one of the major limitations is the ability to identify valuable and rare resources given that these are those that have a lot of impact on a company's success. Such resources cannot be so easily pointed to as the most effective can emerge from several resources working together (Kaufman, 2015).

Another challenge also stems from the fact that large corporations are complicated. You may find it hard to achieve this in such organizations since there is not a direct link for specifically linking a resource to success or failure financially. This complexity can hardly explain how the resources affect economic outcomes in large and varied corporations (Sugiarno & Novita, 2022). This has resulted into the fact that researchers and practitioners are usually faced with difficulties in establishing a definitive link between resource and financial performance in a large scale.

The second theory that exists is known as agency theory. One of the commonest theory in corporate governance and financial performance is agency theory. The theory gives an explanation of stakeholders, CEOs or employees who run the day to day activity and the relationship that exists among them, and the framework. (Panda & Leepsa, 2017). Mr. Richard says that the theory proposes ideas about conflict of interest, severe problems and mechanisms of their administration (Lambert, 2006). First, agency theory can be explained as the theory that views shareholders as owners of the corporation who are represented by the agents (the CEO or employees that run operational activities). Finally, if we have not already mentioned, shareholders explicitly were responsible for providing continuity of funds, and assume the risks and incentive structures. Usually, agents who act on the authority of the shareholders make decisions for shareholders or principals. Based on Agency theory, there may be various issues and challenges which may occur in a corporation or organization resulting in a difference in objectives between shareholders and agents. Additionally, the theory explains the effect of such differences on the financial strength of a corporation. A major challenge in using agency theory in research is the need to come up with a model that can be easily followed and rectified firing from the information or data that's available. Agency theory is used in research so widely that there are legs. But the theoretical framework usually presents no challenges, but most challenges are a result of data collection problems (Lacruz, 2020; Panda & Leepsa, 2017).

Both theories are used to conclude the hypotheses by reframing the relationship between corporate governance and financial performance. Regarding the resource-based view theory, corporations make unique and valuable decisions to secure the most useful resource: the environment. The article further explains that corporations strengthen their environmental capabilities to safeguard the environment. Additionally, corporations strengthen the capability of stakeholders by promoting environmental awareness, leading to decisions based on the best alternative considering the limited resources. Adopting this theory in the corporation will eventually enhance its financial position (Albertini, 2019). Moreover, by applying the principles of the RBV theory, stakeholders will consider making decisions based on strategic planning, including risk management and business continuity. An article also illustrated the positive impact of effective carbon management on financial performance (Busch & Hoffmann, 2011). In the agency theory, the article raised a hypothesis on the effect of the effective implementation of climate governance in the presence of institutional investors. As explained in this section, the agency theory tests the relationship between stakeholders and agents and how it affects decision-making. According to the article, institutional investors are not unified investors. Therefore, this could raise concerns about

conflict of interest. It also explains that institutional investors could be classified as long-term and short-term. The long-term investors will focus more on corporate sustainability by promoting more ideas, thoughts, and solutions toward sustainability. On the other hand, short-term investors will focus more on profitability and current actions, so they may neglect the climate change risk (Garcia-Sanchez et al., 2021), a perfect example of utilizing agency theory in the article.

Corporate governance

Corporate governance is a crucial research area based on the fact that it has the duty to set strategies for organizations, so that the business organizations can realize the economic profits goals without the suppression of social and environmental responsibilities. The notion of climate governance presents a sub field which deals with the climate risks and opportunities and their inclusion into a corporate system and decisions (Aibar-Guzmán et al., 2022). This Review seeks to identify how corporate governance frameworks have advanced in addressing environmental sustainability by establishing crucial theoretical contributions, measures, and effects on financial performance (FP).

Corporate governance has been historically defined as the system of rules, practices, and processes operating in companies, utilizing which they are managed and monitored (Ludwig & Sassen, 2022). Technical reforms include the structure and composition of the board of directors, shareholders' power and protection, and checks and balances meant to handle self-interested agency problems. The agency theory of corporate governance has provided a theoretical framework that ensures that the managers act in the best interest of shareholders and reduces any possibility of agency costs. Currently, the focus of corporate governance goes beyond its financial responsibilities and includes environmental, social, and governance (ESG) aspects recognized by investors and other regulatory authorities (Garcia-Sanchez et al., 2021).

H1. Effective climate governance is positively associated with FP.

Emergence of Climate Governance

Climate governance has become an important solution due to the increasing demand for organizations to manage climate risks within their management structures. This is not a part of conventional theories of governance because it entails practices by which firms can prevent, adapt to, and overcome risks associated with climate change. Climate governance structures have been identified as establishing segment committees for climate change, executive managers' incentives linked to climate change, and reporting on climate change in line with international standards. Such practices are based on the RBV, which identifies unique, value-creation-oriented, and sustainability-related capabilities.

H2. The effect of effective climate governance on FP is strengthened by climate performance.

Linkages Between Climate Governance and Financial Performance

Literature on the links between corporate governance climate and financial performance has attracted much research interest. Several authors reveal that such organizations, which possess well-developed climate governance mechanisms, may have improved financial performance. Environmental factors can trigger cost savings, enhance brand image, and reduce risks. Moreover, Busch and Hoffmann (2011) reveal that efficient carbon management in climate governance positively links to the return on assets and equity (ROA & ROE), showing that environmentalism has financial benefits.

Aibar-Guzmán et al. (2023) supply evidence that synthesizing climate performance into corporate governance improves the market value of a company (Aibar-Guzmán et al., 2022). This connection is not straightforward, given that climate wins in terms of Tobin's Q and ROA are even larger when firms also deliver on climate (Okafor et al., 2021). This implies an interaction between climate governance and financial performance, which means that the ability by which climate governance directly influences financial performance will depend on the company's management of its environmental impact.

Some of the specific structural and procedural forms of climate management include specific sustainability committees of the board, Executives' remuneration linked to climate targets, and embedding of the Environmental, Social, and Governance (ESG) reporting frameworks. Furthermore, these mechanisms facilitate signalizing and alter the organization and its integration of climate goals into business strategies (Principale & Pizzi, 2023). For instance, Aibar-Guzmán et al. (2022) underscore that firms with robust climate governance are better positioned to address long-term climate change questions, as such firms are more credible to their stakeholders and, therefore, are valued higher (Aibar-Guzmán et al., 2022).

Another aspect that defines the subject is the impact of the regulatory environment on implementing climate governance measures. The European Union (EU) directive on Sustainable Corporate Governance is a perfect example of policy change for longer-term sustainable development by encouraging companies not to be short-sighted and lending with climate risks (Albitar et al., 2023). It is part of climate governance principles that can be prescribed by institutions like the World Economic Forum, which calls on organizations to engage in the responsible regulation of climate impact involving their operations.

H3. The presence of institutional investors is associated with effective climate governance.

Institutional Ownership and Influence on Climate Governance

Climate governance is closely linked to institutional investors due to their vast impact on companies, largely through voting and having members sit on boards (Aibar-Guzmán et al., 2022). Research shows long-term (LT) institutional owners like pension funds and government institutions will likely support climate governance mechanisms. This is because they have long-term investment plans and focus more on long-term investments yielding good returns. On the other hand, short-term (ST) investors mainly driven by monetary gains are highly likely to challenge environmental goals, detracting from climate governance.

The shifting of the investors' behavior into a simple bimodal distribution is further compounded by the fact that the group's share ownership is almost homogeneous. The outcome of the research done by Giordino and other researchers indicates that there is a significant positive correlation between long-term investors' ownership concentration and climate governance because of the concentrated voting that occurs in long-term investors to address initiatives and sustain governance changes on climate issues relating to sustainability (Giordino et al., 2024). These outcomes add to the understanding of how the features of institutional investors shape environmental governance present across firms. The influence of institutional ownership depends on how voting rights are distributed (Aibar-Guzmán et al., 2023; Aibar-Guzmán et al., 2022; Garcia-Sanchez et al., 2021).

Therefore, Hypothesis H3 has been further split into two sub-hypotheses:

H3a. Ownership by long term (short-term) investors has a positive (negative) correlation with effective climate governance

H3b. A homogeneous distribution of ownership among long term (short term) investors is positively (negatively) linked to effective climate governance **(Figure 1 in Appendix).**

5. Empirical Design and Methodology

5.1. Empirical Design

5.1.1. Sample

Empirical research method here also develops the strategy that we analyze a balanced data sample data panel consisting of 6,300 observations from a sample of 630 multinational firms over 10 years (2015–2024). These multinationals span seven industries from the Organization for Economic Co-operation and Development (OECD) 10 countries, providing a comprehensive cross-industry and cross-regional dataset (Garcia-Sanchez et al., 2021). Cross-industry data and longitudinal observations are part of the panel structures that allow observing dynamic relationships and the climate performance moderating effect (Aibar-Guzmán et al., 2023).

5.1.2. Research Models

The relationships are modeled using two core equations:

Financial Performance Model (Equation 1)

The purpose of this model is to individually analyze the direct and moderating effects of climate governance on financial performance. These components include the dependent variable namely Financial Performance (FP), measured in terms of Return on Asset (ROA), Market to Book ratio (MtoB) and Tobin's Q. Climate governance score (ClimGov) is the independent variable and emission score (EmissionScore) is moderator variable. Moreover, the model includes several control variables, including firm size (Fsize), firm age (Fage), leverage, R&D investments and board characteristics, such as size, activity, and independence. The grouping is also decomposed by industry and country fixed effects to account for contextual differences.

Equation:

$$Fin\_Perf_{i,t} = \delta 0 + \beta 1 ClimGov_{i,t} + \delta 2 EmissionScore_{i,t} + \beta 3 ClimGov\ EmissionScore_{i,t} + \delta 4 InstInv_{i,t} + \delta 5 Analyst_{si,t} + \delta 6 Fage_{i,t} + \delta 7 Fsize_{i,t} + \delta 8 ROA_{i,t} + \delta 9 Leverage_{i,t} + \delta 10 R\&D\_Invi_{,t} + \delta 11 AdverstInvi_{,t} + \delta 12 CapexInvi_{,t} + \delta 13 Bsize_{i,t} + \delta 14 Bactivity_{i,t} + \delta 15 Bindepi_{,t} + \delta 16 Duality_{i,t} + \delta 17 Bdiversity_{i,t} + \delta 18 Btenure_{i,t} + \delta 19 ERRI_{i,t} + \delta 20 ERRI_{i,t} + \delta 21 EU_{i,t} + \delta 22 Covid_{t} + \delta 23 Country_{i} + \delta 24 Industry_{i} + \delta 25 Year_{t} + \varepsilon_{it} + \eta_{i}$$

Specific hypothesis testing involves:

- **H1:** Supported if $\beta 1 > 0$.
- **H2:** Supported if $\beta 3 > 0$.

Climate Governance Model (Equation 2)

It assesses the effect that institutional investors have on climate governance. The dependent variable is climate governance score (ClimGov) and the independent variables are long term (LT_InstInv) and short term (ST_InstInv) institutional investors' voting rights and board representation. In addition, the model also contains a moderator variable representing the homogeneity in voting rights among long term and short term investors in order to determine how uniformity of a constituency affects the outcomes of climate governance.

Equation:

$$ClimGov_{i,t} = \delta 0 + \delta 1 LT\_InstInv_{i,t} + \delta 2 ST\_InstInv_{i,t} + \delta 3 LT\_InstDiri_{,t} + ST\_InstDiri_{,t} + \delta 5 HomLT\_InstInv_{i,t} + \delta 6 HomST\_InstInv_{i,t} + \delta 7 EmmisionScore_{i,t} + \delta 8 Analyst_{si,t} + \delta 9 Fage_{i,t} + \delta 10 Fsize_{i,t} + \delta 11 ROA_{i,t} + \delta 12 Leverage_{i,t} + \delta 13 R\&D\_Invi_{,t} + \delta 14 AdverstInvi_{,t} + \delta 15 CapexInvi_{,t} + \delta 16 Bsize_{i,t} + \delta 17 Bactivity_{i,t} + \delta 18 Bindepi_{,t} + \delta 19 Duality_{i,t} + \delta 20 Bdiversity_{i,t} + \delta 21 Btenure_{i,t} + \delta 22 ERRI_{i,t} + \delta 23 ERRI_{i,t} + \delta 24 EU_{i,t} + \delta 25 Covid_{t} + \delta 26 Country_{i} + \delta 27 Industry_{i} + \delta 28 Year_{t} + \varepsilon_{it} + \eta_{i}$$

Hypothesis breakdown:

- **H3a:** Supported if $\delta 1 > 0$ for LT investors and $\delta 2 < 0$ for ST investors.
- **H3b:** Homogeneity (e.g., HomLT_InstInv) strengthens these effects, with expected signs $\delta 5 > 0$ and $\delta 6 < 0$.

The article specifies homogeneity formulas for institutional investors:

- $HomLT\_InstInv_{i,t} = 1 - \sum_{i=1}^{3} VR2i$
- $HomST\_InstInv_{i,t} = 1 - \sum_{i=1}^{3} VR2i$

Where Voting Rights (VR) represents voting rights. These capture the distribution equality among investors, emphasizing the impact of uniform decision-making.

5.2. Methodology

This study utilizes panel data regression to examine the relationships between climate governance, financial performance, and institutional ownership. Two types of regression models are applied. For continuous outcomes such as financial performance (measured through ROA, MtoB, and Tobin's Q), linear regression is employed. In cases where the dependent variable, such as climate governance (ClimGov), is an ordinal composite index, ordinal regression is used to capture its ordered nature.

Both models incorporate lagging of independent variables by one period to address potential endogeneity, ensuring causality and reducing reverse

influence between dependent and independent variables. Interaction terms, specifically the product of ClimGov and emission performance (EmissionScore), are introduced to test the moderating hypothesis that better climate performance amplifies the effect of climate governance on financial outcomes. Reducing multicollinearity arising from interaction terms (e.g., ClimGov × EmissionScore) is achieved by centering variables by subtracting their mean values. This approach aligns with Equation (1)'s specification. EmissionScore, reflecting climate performance, is explicitly sourced from EIKON, a Thomson Reuters database renowned for comprehensive financial and ESG data.

5.3. Variables

5.3.1. Climate Governance (ClimGov)

It is a composite index that ranges from zero to six and denotes the degree of climate governance within firms (Bui et al., 2020). It includes crucial parts, including sustainability committees, the connection of ESG factors and executive remuneration, external assurance of climate-related information, and compliance with international reporting guidelines.

5.3.2. Financial Performance (FP)

Performance is captured through three metrics: The efficiency ratios include Return on Assets (ROA) for profitability, Market-to-Book ratio (MtoB) for valuation, and Tobin's Q.

5.3.3. Institutional Ownership

Institutional investors are classified based on investment horizon: long-term (LT_InstInv), usually pension funds and family firms, and short-term (ST_InstInv), primarily financial institutions. Ownership proportions are measured by the extent of LT_InstDir and ST_InstDir, reflecting the board participation rates.

5.3.4. Control Variables

These firm-level factors are firm size and age, leverage, research and development intensity, gender diversity on the boards, whether the CEO and chairperson are the same person, and influences from the external environment, such as the COVID-19 pandemic in 2020, industry, and geographic effects). The pandemic is a critical contextual variable affecting governance practices and financial outcomes. These make the results more reliable and robust and address other factors affecting the relationship between governance and performance.

5.4. Data and Variables

5.4.1. Primary Data Sources

The study adopts various and rich data sources to increase reliability. All financial data of ROA, MtoB, and Tobin's Q are obtained from Thomson Reuters EIKON and give the correct information about the performance of firms. Climate governance indices are compiled from the ESG measures applied in the prior literature (Bui et al., 2020). These metrics indicate the level to which climate has been integrated into the firms' governance systems. The control variables are obtained from firms' financial data and other public data resources and consist of company and macro-level factors. Altogether, these data sources lead to an information set that explains all those combinations of causal relations between governance, performance, and institutional ownership.

A clear understanding of the research objectives is followed to define the study's variables well. According to **Table 1 in Appendix**, ROA gives profitability indicators as a ratio of net income to total assets, while MtoB provides the market with value compared to the company's book value. Tobin's Q measures the efficiency of the market by the ratio of the firm's value in the market to the value of its assets in case these assets can be replaced (Salvi et al., 2020). ClimGov is an index between 0 and 6 and reflects climate governance mechanisms. EmissionScore is used to analyze performance concerning emission reduction. Firms' institutional ownership is disaggregated as LT_InstInv (long-term institutional investors) and ST_InstInv (short-term institutional investors), while HomLT_InstInv captures the degree of voting right equality on institutional investors' stakes. Some of the control variables are captured by the logarithm of the firm age (Fage) and the logarithm of the total assets (Fsize).

These definitions make empirical analysis precise without confusion about what is being studied and measured.

6. Results and Discussion

6.1. Descriptive Results

For the empirical models in Equations 1 and 2, the standard deviation and mean of the variables are essential provide estimates. The average economic return is 5.6% and the book value is increased by at least 1.5 times. With a development score of 3.280 approximately half way through the scale (0 to 6), the sampled companies have developed a climate governance. Overall this indicates that on average firms make progress in climate governance initiatives. These statistical measures identify within firms differences in governance effectiveness and recommend how climate-related strategies relate to financial returns.

The long term (LT) and short term (ST) investor voting rights reported at 12.6% and 7.7%, respectively, show the differences on the investor influence on corporate decision making. For ST investors, homogeneity level is 0.335 and for LT it is 0.593. In addition, more institutional directors are associated with LT investors (19.9%) than ST investors (10.3%). Since all these investors' decisions made a difference, LT investors must engage in the corporate governance process to a greater extent than others, contributing to a more stable and long term oriented decision making in the firm. As can be seen from **Table 2 in Appendix**, all variables used in analysis do not have collinearity issues.

6.2. The financial benefits of effective climate governance- Equation (1)

In this study, the H1 and H2 are confirmed for the testing of control hypothesis when $\beta 1 > 0$ and $\beta 3 > 0$ across overall models used in this study. The significant role that key variables have on the impact of effective climate governance practices on financial performance is established. The role of the climate governance in enhancing corporate reliability is shown by market based and accounting based indicator namely Market to Book ratio (MtoB) and Tobin's Q as well as Return on Assets (ROA). Additionally, **Table 3 in Appendix** shows those results for Equation (1) with and without the ClimGov*EmissionScore interaction term to dispel numerous concerns about multicollinearity and the use of centered variables. The support provided by a 99% confidence level to Hypothesis H1, that is, climate governance (ClimGov) positively affects corporate financial performance (FB) is validated by this study. Specifically, based on ROA (ClimGov: 1.675, $p < 0.01$), the impact of climate governance on the economic profit is noted to be stronger than on company market values such as Tobin's Q (ClimGov: 0.000172, $p < 0.01$) and MtoB (ClimGov: 0.00000106, $p < 0.01$). The results in this paper provide very strong evidence that effective climate governance is good for the firm's financial performance. Therefore, Hypothesis H1 is accepted consistent with the majority of previous research conducted (Aggarwal & Dow, 2012; Busch & Hoffmann, 2011; Okafor et al., 2021) that has shown by the existence of a strong link between corporate climate governance practices and its realization in the improvement of financial outcomes.

The 99% confidence level tests Hypothesis H2, by which the impact of climate performance (EmissionScore) has a significant positive effect on financial performance of the sampled corporations. This work has strong impact on all financial performance indicators and the most significant impact occurs for ROA (coeff. = EmissionScore: 0.0497, $p < 0.01$). Tobin's Q has a stronger effect on the market based measures (EmissionScore: coeff. = 0.00000526; $p< 0.01$) then does the Market to Book ratio (EmissionScore: coeff. = 0.0000000561; $p < 0.01$). This supports previous research (Aggarwal & Dow, 2012; Gallego-Álvarez et al., 2015; Ganda & Milondzo, 2018; Iwata & Okada, 2011), that better climate performance matched with higher financial performance. Additionally, in relation to the financial performance for all companies, the relationship between climate governance and the interaction between climate performance (ClimGov: EmissionScore) is positive and with the levels of confidence ranging from 95 to 99%. These findings then point to their significance in terms of the indicators for ROA (Coeff: 0.0197 and P value <

0.01), Tobin's Q (Coeff: 0.000002296 and P value < 0.01), and MtoB (Coeff: 0.0000000133 and P value < 0.05). These results offer strong support to Hypothesis H2: The boon of good climate governance may depend on the depth of a company's greenhouse gas (GHG) reduction efforts. This confirms that there is a positive correlation between environmental performance and climate governance with the financial results.

To improve robustness and reliability, several financial performance measures were used. The same findings were reinforced through both standard and advanced methodological approaches. As showed by similarity between Panels A and B in **Table 3 in Appendix**, the results could be reinforced by the application of the Generalized Method of Moments (GMM). Specifically, the study's methodological rigor underscores its contribution to an understanding of the positive relationship between climate governance and the climate performance of a firm with positive corporate financial outcomes.

6.3 The influence of institutional investors on climate governance-Equation (2)

The values obtained from the fourth column of Table 4 are the same as Equation 2's findings. As mentioned earlier, a stepwise estimation method used the information gained from three different models separately for each model that assumes the active participation of institutional investors. The influence of long term (LT) as well as short term (ST) investors is also analyzed to determine the long term impact of various shareholders, depending on their time horizons. As shown in Table 4, there is a strong positive association between active participation of LT investors in climate governance. The two main drivers of these benefits are to participate in the board of directors and voting rights. **Table 4 in Appendix** supports this conclusion with the fact that the coefficients δ1 0.90, δ3 0.95, which hold a confidence of 90% and 95%, respectively. On the other hand, the individual commission findings suggest that ST investors are likely to be less effective in contributing to climate governance due to the fact that they concentrate on short term compensation incentives. The fifth column of Table 4 further demonstrates that active participation as a director of (or having a share in) LT investors does increase climate governance by 0.00317 more and by 0.0157 more if the investors possess voting rights. These results provide strong evidence in support of Hypothesis H3a that LT investors tend to have a positive corporate governance effect.

Regarding the H3b, the results only allow us to confirm the relationship between homogeneity and climate governance partially. The insignificance of the last coefficient drives the partial confirmation. However, the result proves that in the case of the LT investors, H3b could be accepted since the effect is positive at a confidence level of 90%. Additionally, the findings prove that the largest companies that are more committed to climate governance are the ones with better CC performance. Also, companies with more diversity on the board of directors adhere more to climate governance than the companies their CEOs have chaired. The utilization of different measurement tools is proof of the strength of the results.

7. Conclusion

This study highlights that climate change is important by way of 'the business case for corporate sustainability.' In particular, it looks into how the implementation of climate governance is linked with financial performance. Hypothesis H1 is confirmed as there exists a positive association between financial outcomes and strong climate governance frameworks. In this way, the efficient allocation and use of resources provide to the implementation of sustainability in the corporate strategy its value. Moreover, the results revealed that climate governance and financial performance (H2) are linked with moderate relationship to climate performance. Not only did it show that long term investors have a big role in the adoption and effectiveness of climate governance principles, but also that such principles themselves are shaped by long term oriented parties. In addition, theoretical implications are added by the research through the RBV and the agency theories. The evidence suggests to corporations that they can employ climate governance principles effectively to enhance financial

performance through the utilization of resources. The setting also illustrates the contribution of various institutional investors to shaping financial outcomes in line with the theory of agency. In the final part, the study employs corporate governance theories to explain how climate governance affects the corporation, and the financial benefits that come with an integration of corporate sustainability practices.

7.1. Practical Implications

This study offers recommendations for corporations aiming to enhance their financial performance. First, implementing climate governance can significantly improve financial outcomes. Therefore, we recommend companies adopt and reinforce climate governance practices to achieve better economic performance. Additionally, the study highlights that fostering a homogenous relationship with long-term investors enhances financial performance. To this end, companies are advised to strengthen their relationships with long-term investors and align their decision-making mechanisms with these stakeholders to increase the likelihood of improved financial outcomes.

7.2. Limitation and future research

Several research areas can be addressed in future study. It does not first investigate impacts of climate governance on companies in the Kingdom of Saudi Arabia or other Gulf countries to explain what is meant by regional implications. This extends the scope geography to provide possible findings about how climate governance works in other regulatory and economic environments. Moreover, climate governance is conceptualized in the study as a single construct and not analyzed as its elements. Future research could consider separately the different ingredients of climate governance to see their effect on financial performance; this would give a more nuanced understanding of its mechanisms. In addition, this study examines only two types of institutional investors—long-term and short term and, therefore, the other investor categories are excluded. But such an analysis could be expanded into future studies by including not only CSR, but other investor types as well such as hedge funds, sovereign wealth funds or impact investors in order to gain a more comprehensive look at the ways in which different investment strategies help shape climate governance, and corporate financial outcomes. Further research on these areas would expand the potential of such an understanding of how climate governance relates to investor behavior and financial performance.

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TABLE 1 Variables and statistics.

Variable	Definition	Mean/freq.	Std.
TobinQ	Market price per share/book value per share	1.511	1.172
MtoB	Market value/replacement value of the assets	1.421	1.183
ROA	Net income by total assets	5.457	7.843
ClimGov	Composite score of climate governance mechanisms	3.171	1.147
LT_InstInv	Percentage of voting rights of LT institutional investors	0,066	0.178
ST_InstInv	Percentage of voting rights of ST institutional investors	0.115	0.321
LT_InstDirec	Percentage of institutional directors of LT institutional investors	0.188	0.387
ST_InstDirec	Percentage of institutional directors of ST institutional investors	0.112	0.242
HomLT_InstInv	Level of homogeneity of voting rights of LT institutional investors	0.324	0.114
HomST_InstInv	Level of homogeneity of voting rights of ST institutional investors	0.582	0.148
EmissionScore	Firms' performance relating reduction of environmental emissions	68.332	24.167
Fage	Logarithm of the firm's years	3.444	0.732
Fsize	Logarithm of firms' total assets	16.228	1.508
Leverage	Ratio between debt and total assets	0.573	0.452
R&D_Inv	Investment intensity in R&D to sales	29,766	44,000
Advert_Inv	Investment intensity in advertising to sales	24,000	17,200
CAPEX_Inv	Investment intensity in capital to sales	17,800	13,500
Bsize	Number of members (directors)	13.00	3.416
Bactivity	Number of meetings of the board per year	9	5.466
Bindep	Proportion of independent directors	0.600	0.275
Duality	Dummy that takes value 1 if the CEO is the chair of the board	0.565	
Bdiversity	Percentage of female directors	0,180	0.125
Btenure	Tenure of the directors	6.787	3.181
Analysts	Number of financial analysts that cover the firm	17.218	8.521
ERRI	The Environmental Regulatory Regime Index	0.812	0.677
EPI	The Environmental Performance Index	60.736	8.828
EU	Dummy coded 1 from EU countries from 2018 to 2024 (Garcia-Sanchez et al., 2022)	0.283	

TABLE 2

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	TobinQ	1													
2	MtoB	0.355**	1												
3	ROA	0.566**	0.161***	1											
4	ClimGov	-	-	-	1										
5	LT_InstIn	-0.014	-0.040**	-0.007	0.036**	1									
6	ST_InstIn	0.013	-0.002	0.033**	-	-	1								

7	HomLT_I	0.002	0.021*	0.002	-	-	0.127**	1								
8	HomoST_	-0.012	0.013	-	0.108**	0.125**	-	-	1							
9	LT_InstDi	0.022**	0.063**	0.018	-	0.144**	0.173**	-	-	1						
10	ST_InstDi	0.023**	0.047**	0.014	-	-	0.511**	0.136**	-	0.471**	1					
11	EmissionS	-0.023*	0.000	-0.023**	0.387**	0.018	-	-0.015	0.082**	-	-	1				
12	Fage	-0.013**	0.022*	-0.027**	-0.016	-	-	0.079**	0.136**	-	-	0.145**	1			
13	Fsize	-	-	-	0.241**	0.055**	-	-	0.113**	-	-	0.388**	0.068**	1		
14	Leverage	0.002	-0.021*	0.026**	-	0.074**	0.129**	-	-	0.125**	0.084**	-	-0.002	-	1	
15	R&D_Inv	0.003	-0.007	0.023*	-0.018	-0.023*	-0.002	0.015	0.013	-0.014	0.012	0.024**	0.018	0.066**	0.018*	
16	Advert_In	0.006	-0.008	0.032**	-	-0.005	0.057**	-0.002	-	0.036**	0.077**	-0.014	0.018	0.058**	0.332**	
17	CAPEX_I	-0.014	-0.023*	0.024**	-	0.068**	0.052**	-	-	0.038**	0.053**	-0.021*	-0.005	0.066**	0.439**	
18	Bsize	-	-	-	0.106**	0.105**	0.056**	-	-	0.031**	-0.012	0.205**	0.108**	0.444*	-	
19	Bactivity	-	-	-	-0.022*	0.056**	-	-	0.032**	-	-0.046	0.017	0.021*	0.124**	0.048**	
20	Bindep	-0.018	-	-0.009	0.202**	-0.018	-	0.024**	0.071**	-	-0.388	0.123**	-	0.122**	-	
21	Duality	-	-	-0.022*	0.023*	0.049**	0.048**	-	-	-	0.012	-	-	-	0.064**	
22	Bdiversity	0.071**	0.005	0.037**	0.298**	0.064**	-	-	0.134**	-	-0.096	0.163**	-0.018	0.088**	-	
23	Btenure	0.091**	0.034**	0.058**	-	-	0.025**	0.071**	0.012	0.121**	0.092	0.027**	0.162**	0.001	-	
24	Analysts	0.152**	-0.008	0.111***	0.158**	0.005	-	-0.004	0.064**	0.014	0.015	0.303**	-	0.441**	-0.007	
25	ERRI	0.015	0.096**	-0.032**	0.125**	-	-	0.111**	0.374**	-	-0.107	0.117***	0.034**	0.032**	-	
26	EPI	-0.008	0.122**	-	-0.009	-0.013	-	-	0.174**	-	-0.052	0.058**	-	0.045**	-	
27	EU	0.027**	0.117***	-	0.196**	0.157**	-0.018	-	0.023**	0.018	-0.022	0.188**	-	0.052**	-	
28	Covid	0.008	0.005	-	0.123**	-0.009	0.007	0.020	-0.008	-	-0.008	0.081**	0.058**	0.024**	0.007	

TABLE 2 (Continued)

		15	16	17	18	19	20	21	22	23	24	25	26	27	28
15	R&D_Inv	1													
16	Advert_In	0.885**	1												
17	CAPEX_I	0.772**	0.892**	1											
18	Bsize	-0.017	-0.038**	-0.039**	1										
19	Bactivity	0.001	0.029**	0.062**	-0.001	1									
20	Bindep	-0.005	-	-0.021*	0.022*	-	1								
21	Duality	-	-0.028**	-0.007	-	0.056**	0.062**	1							
22	Bdiversity	-	-	-	0.002	-	0.258**	0.002	1						
23	Btenure	-	-	-	-0.003	-	-	-	-0.022	1					
24	Analysts	0.106**	0.106**	0.093**	0.195**	-	0.107**	-	0.074**	0.046**	1				
25	ERRI	-	-	-	-	-	0.037**	-	0.322**	-	0.012	1			
26	EPI	-0.013	-	-	-	0.039**	-0.008	0.046**	0.123**	-	0.054**	0.644**	1		
27	EU	-0.025**	-	-	0.107**	-	0.135**	-0.008	0.395**	-	0.076**	0.242**	0.325**	1	
28	Covid	0.007	0.008	0.005	-	0.003	0.068**	0.027**	0.182**	-0.004	-	0.001	0.001	0.237**	1

TABLE 3

Panel A: Basic and robust results with linear regression

	Firms' FP									
	TobinQ		**MtoB**		**ROA**					
	Coeff.	**(std.**	**Coeff.**	**(std.**	**Coeff.**	**(std.**	**Coeff.**	**(std.**	**Coeff.**	**(std. error)**
ClimGov	2.30e-04*	(1.34e-	0.000171***		2.02e-06*	(1.05e-	1.06e-06***		0.390***	(0.123)
EmissionScore	1.38e-07**	(6.82e-07)	5.26e-05***	(1.42e-06)	1.77e-07*	09)	(9.12e-	5.61e-08***	(1.85e-08)	0.00757* (0.00313)
ClimGov* EmissionSc			2.29e-05***	(4.31e-07)				1.33e-08**	(5.56e-09)	
InstInve	5.86e-06	(8.66e-	7.00e-06	(8.67e-	4.16e-07**			4.28e-08**		-0.00534
Analysts	2.26e-04***		2.19e-04***		7.56e-07**			7.30e-08**		0.148***
Fage	2.10e-04	(3.06e-	3.03e-04	(3.06e-	3.36e-06	(6.00e-	4.17e-07	(6.01e-	-0.106	(0.219)
Fsize	-0.000302***		-0.000315***		-1.65e-05***		-1.66e-06***		-1.524***	(0.141)
ROA	2.58e-04***		2.56e-04***		1.18e-06***		1.17e-07***			
Leverage	-7.51e-07	(4.69e-	7.77e-07*	(4.68e-	1.07e-10	(7.16e-	1.20e-10	(7.16e-	-0.000845**	
R&D_Inv	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	-8.67e-10	(6.52e-
Advert_Inv	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	1.84e-10	(2.03e-
CAPEX_In	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	2.33e-10	(2.07e-
Bsize	5.54e-07	(5.21e-	5.72e-05	(5.20e-	9.23e-08	(7.15e-	9.35e-08	(7.14e-	-0.0103	(0.0456)
Bactivity	-2.64e-07	(2.77e-	2.45e-05	(2.77e-	2.50e-08	(3.69e-	2.46e-08	(3.69e-	0.0108	(0.0250)
Bindep	-2.21e-06	(3.17e-	2.49e-06	(3.17e-	1.94e-09	(4.10e-	2.02e-09	(4.10e-	-0.00286	

Duality	-6.67e-04**		6.77e-04**		3.61e-07	(3.79e-	3.62e-07	(3.79e-	-0.492* (0.263)		-0.517** (0.263)	
Bdiversity	7.44e-06	(1.16e-	9.61e-06	(1.16e-	3.75e-08**		3.92e-08**		0.0228**		0.0238** (0.0106)	
Btenure	4.37e-07	(5.93e-	1.01e-05	(5.92e-	1.26e-07	(8.33e-	1.33e-07	(8.33e-	-0.118** (0.0509)		-0.111** (0.0509)	
ERRI	3.77e-04	(6.41e-	3.50e-04	(6.41e-	6.49e-07	(1.81e-	6.40e-07	(1.81e-	-0.390 (0.430)		-0.407 (0.430)	
EPI	-3.14e-05	(4.62e-	-2.84e-05	(4.62e-	3.52e-07***		3.54e-07***		-0.0344 (0.0306)		-0.0324 (0.0306)	
EU	3.10e-04***		2.73e-04***		3.21e-06***		2.98e-06***		0.222***		0.194** (0.0786)	
Covid	9.47e-04***		9.41e-04***		4.56e-06	(3.41e-	4.44e-06	(3.41e-	-1.787*** (0.262)		-1.781*** (0.261)	

Panel A: Basic and robust results with linear regression

	Firms' FP											
	TobinQ				**MtoB**				**ROA**			
	Coeff. (std. error)		**Coeff.**	**(std.**	**Coeff.**	**(std.**	**Coeff.**	**(std.**	**Coeff.**	**(std.**	**Coeff.**	**(std.**
Industry	Yes		Yes		Yes		Yes		Yes		Yes	
Country	Yes		Yes		Yes		Yes		Yes		Yes	
R-square	0.3298***		0.3923***		0.0742**		0.0753**		0.1263***		0.1284***	

TABLE 3 (Continued)

Panel B: Robust results with GMM estimator

	Firms' FP											
	TobinQ				**MtoB**				**ROA**			
	Coeff. (std. error)		**Coeff.**	**(std.**	**Coeff.**	**(std.**	**Coeff.**	**(std.**	**Coeff.**	**(std.**	**Coeff.**	**(std.**
ClimGov	4.64e-05***	(5.86e-06)	4.45e-05***		2.69e-07***		-1.95e-07**		0.454***	(0.0608)	0.950***	(0.104)
EmissionSco	3.59e-05***	(1.72e-06)	3.40e-05***		2.19e-07***		2.16e-07***		0.0454***		0.0262***	
ClimGov*EmissionScore			3.21e-08***				7.99e-09***				-0.00856***	
InstInve	0.000239***	(6.87e-	0.000237***		1.99e-07***		2.16e-07***		1.134***	(0.0550)	1.221***	(0.0589)
Analysts	-1.36e-05***	(5.91e-07)	-1.44e-05***		-4.99e-08***		-5.74e-08***		-0.0363***		-0.0418***	
Fage	7.70e-05***	(2.29e-05)	8.95e-05***		-2.29e-07	(1.79e-	-1.21e-07	(1.74e-	0.0197 (0.284)		0.244 (0.301)	
Fsize	-0.000192***	(1.87e-	-0.000154***		-1.63e-06***		-1.47e-06***		-1.237***	(0.144)	-0.864***	(0.143)
ROA	1.21e-05***	(4.79e-07)	1.23e-05***		2.94e-08***		3.30e-08***		0.000	(0.000)	0.000	(0.000)
Leverage	-2.95e-07***	(3.53e-09)	-3.07e-07***		-1.09e-10***		-1.26e-10***		-0.00421***		-0.00420***	
R&D_Inv	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	-5.29e-10***		-5.08e-10***	
Advert_Inv	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	-5.05e-11***	
CAPEX_Inv	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	3.48e-10***		3.64e-10***	
Bsize	-5.88e-05***	(3.09e-07)	-5.93e-05***		-4.31e-07***		-6.11e-07***		-0.174***	(0.0170)	-0.170***	(0.0163)
Bactivity	-5.29e-05***	(4.89e-07)	-4.67e-05***		5.84e-08**	(2.56e-	6.75e-08***		-0.168***		-0.172***	
Bindep	2.85e-06***	(8.06e-08)	2.04e-06**		1.05e-07***		9.84e-08***		-0.00337***		-0.00388***	
Duality	-6.88e-05***	(3.36e-07)	-2.11e-05***		-1.08e-06***		-9.89e-07***		0.0316***		0.0205***	
Bdiversity	6.85e-05***	(4.05e-07)	6.17e-04***		5.40e-06***		5.18e-08***		-0.0301***		-0.0351***	
Btenure	-1.86e-04***	(2.75e-06)	-1.97e-04***		-6.53e-03***		-4.90e-03***		-0.0644	(0.0392)	-0.0875**	
ERRI	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)
EPI	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)	0.000	(0.000)

EU	4.30e-05 (7.39e-06)	-1.82e-05	6.75e-07	(4.73e--8.66e-08	(4.60e-	0.115 (0.0806)	0.104 (0.0828)
Covid	5.51e-04*** (3.24e-06)	5.51e-04***	2.03e-06***	2.22e-06***	-1.662***	-1.672***
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Country	Yes	Yes	Yes	Yes	Yes	Yes
ml	-0.92	-0.94	-0.87	-0.88	-4.43	-4.42
m2	0.13	0.11	-1.42	-1.42	-0.93	-0.88
Hansen test	477.14	484.12	326.66	342.76	344.66	355.88

TABLE 4

Panel A: Basic and robust results with ordinal regression

	Climate governance (ClimGov)				
	Coeff. (std. error)	**Coeff. (std. error)**	**Coeff. (std. error)**	**Coeff. (std. error)**	**Coeff. (std. error)**
LT_InstInv	0.00496* (0.00275)	0.0148** (0.00622)		0.0143** (0.00634)	0.0157** (0.00656)
ST_InstInv	-0.00205 (0.00218)	-0.00623 (0.00486)		-0.00695 (0.00510)	-0.00499 (0.00561)
LT_InstDirec			0.00357**	0.00309* (0.00176)	0.00317* (0.00176)
ST_InstDirec			-0.00126 (0.00120)	-0.000119	-0.000173 (0.00137)
HomLT_InstInv		0.000172* (9.64e-		0.000170* (9.74e-	0.000184* (9.89e-
HomST_InstInv		-6.99e-04 (7.38e-		-7.20e-05 (7.50e-05)	-5.13e-05 (7.89e-05)
LT_InstInv*ST_I					-0.000175
EmissionScore	0.0162*** (0.00132)	0.0162***	0.0162***	0.0163***	0.0163*** (0.00131)
Analysts	0.00835* (0.00468)	0.00841* (0.00469)	0.00832*	0.00810* (0.00470)	0.00800* (0.00470)
Fage	-0.00275 (0.0584)	-0.00191 (0.0585)	0.00836 (0.0582)	0.00771 (0.0586)	0.00864 (0.0587)
Fsize	0.208*** (0.0362)	0.212*** (0.0364)	0.206*** (0.0362)	0.209*** (0.0364)	0.210*** (0.0364)
ROA	-0.000602 (0.00244)	-0.000564	-0.000666	-0.000676	-0.000719 (0.00255)
Leverage	-4.84e-04 (8.98e-05)	-5.02e-04 (8.98e-	-6.48e-04 (8.98e-	-5.96e-05 (8.99e-	-5.88e-05 (8.99e-05)
R&D_Inv	0.000 (1.43e-10)	-5.02e-12 (1.43e-10)	-5.47e-12 (1.43e-10)	-5.52e-11 (1.43e-10)	-5.68e-11 (1.43e-10)
Advert_Inv	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
CAPEX_Inv	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Bsize	0.00236 (0.0101)	0.00144 (0.0101)	0.00222 (0.0100)	0.000880 (0.0101)	0.000675 (0.0101)
Bactivity	0.0105** (0.00532)	0.0111** (0.00532)	0.0118** (0.00533)	0.0117** (0.00533)	0.0116** (0.00533)
Bindep	-0.000237	-0.000266	0.0020 (0.00138)	0.00201 (0.00139)	0.00202 (0.00139)
Duality	0.111** (0.0561)	0.115** (0.0561)	0.104* (0.0563)	0.105* (0.0563)	0.104* (0.0563)
Bdiversity	0.0142*** (0.00224)	0.0142***	0.0136***	0.0174***	0.0134*** (0.00227)
Btenure	0.00166 (0.0114)	0.00255 (0.0114)	-0.000156 (0.0114)	0.000857 (0.0114)	0.000618 (0.0114)
ERRI	0.473*** (0.124)	0.4801 (0.124)	0.487*** (0.120)	0.468*** (0.124)	0.470*** (0.124)
EPI	-0.0445*** (0.00866)	-0.0445***	-0.0445***	-0.0434***	-0.0435***
EU	0.185*** (0.0166)	0.186*** (0.0166)	0.188*** (0.0166)	0.186*** (0.0166)	0.186*** (0.0166)
Covid	0.382*** (0.0529)	0.382*** (0.0529)	0.372*** (0.0530)	0.375*** (0.0530)	0.375*** (0.0530)
Industry	Yes	Yes	Yes	Yes	Yes
Country	Yes	Yes	Yes	Yes	Yes
Log likelihood	-6357.3517***	-6355.3705***	-6357.6484***	-6353.722***	-6353.3333***

TABLE 4

Panel B: Robust results with censored regression					
	Climate Governance (ClimGov)				
	Coeff. (std. error)	Coeff. (std. error)	Coeff. (std. error)	Coeff. (std. error)	Coeff. (std. error)
LT_InstInv	0.00116**	0.00566**		0.00577* (0.00286)	0.00785***
ST_InstInv	-0.00149 (0.00113)	-0.00157 (0.00217)		-0.00177 (0.00216)	0.00108 (0.00249)
LT_InstDirec			0.00266**	0.00149**	0.00257**
ST_InstDirec			-0.000443 (0.000446)	-7.46e-05 (0.000603)	-0.000347 (0.000633)
HomLT_InstInv		7.83e-04* (4.54e-		7.90e-04* (4.58e-	9.98e-04** (4.64e-
HomST_InstInv		-4.83e-05 (3.19e-05)		-5.68e-05 (3.25e-	-2.52e-04 (3.42e-05)
LT_InstInv*ST_InstInv					-0.0000067 (9.49e-05)
EmissionScore	0.00978*** (0.000582)	0.00956*** (0.000588)	0.00955*** (0.000578)	0.00956*** (0.000592)	0.00965*** (0.000588)
Analysts	0.00121 (0.00205)	0.00117 (0.00215)	0.00127 (0.00204)	0.00116 (0.00215)	0.00105 (0.00206)
Fage	0.00486 (0.0277)	0.00486 (0.0279)	0.00756 (0.0268)	0.00531 (0.0280)	0.00677 (0.0207)
Fsize	0.104*** (0.0168)	0.106*** (0.0169)	0.105*** (0.0166)	0.106*** (0.0168)	0.106*** (0.0168)
ROA	-0.00271** (0.00114)	-0.00256** (0.00114)	-0.00267** (0.00114)	-0.00267** (0.00114)	-0.00274** (0.00114)
Leverage	2.68e-04 (4.21e-05)	2.65e-04 (4.20e-	2.26e-04 (4.21e-05)	2.60e-04 (4.21e-05)	2.69e-05 (4.21e-05)
R&D_Inv	0.001 (6.09e-11)	0.001 (6.09e-11)	0.000 (6.10e-11)	0.000 (6.09e-11)	0.000 (6.09e-11)
Advert_Inv	0.002 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
CAPEX_Inv	0.001 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Bsize	0.00701 (0.00460)	0.00652 (0.00460)	0.00712 (0.00444)	0.00662 (0.00455)	0.00633 (0.00460)
Bactivity	0.00398* (0.00214)	0.00422*	0.00427* (0.00225)	0.00412* (0.00215)	0.00405* (0.00214)
Bindep	0.000312 (0.000282)	0.000321	0.000424	0.000435	0.000462
Duality	0.0283 (0.0256)	0.0282 (0.0245)	0.0285 (0.0248)	0.0286 (0.0258)	0.0268 (0.0257)
Bdiversity	0.00787*** (0.000982)	0.00776*** (0.000974)	0.00777*** (0.000982)	0.00781*** (0.000992)	0.00763*** (0.000982)
Btenure	-0.00583 (0.00507)	-0.00563	-0.00588 (0.00532)	-0.00577 (0.00522)	-0.00629 (0.00526)
ERRI	0.227*** (0.0601)	0.224*** (0.0600)	0.241*** (0.0577)	0.223*** (0.0600)	0.226*** (0.0603)
EPI	-0.0203*** (0.00408)	-0.0217*** (0.00428)	-0.0214*** (0.00417)	-0.0207*** (0.00430)	-0.0213*** (0.00422)
EU	0.0824*** (0.00752)	0.0837***	0.0837*** (0.00754)	0.0830***	0.0833*** (0.00766)
Covid	0.151*** (0.0244)	0.152*** (0.0255)	0.150*** (0.0244)	0.151*** (0.0254)	0.151*** (0.0266)
Industry	Yes	Yes	Yes	Yes	Yes
Country	Yes	Yes	Yes	Yes	Yes
Log likelihood	-7283.613***	-7282.117***	-7284.106***	-7281.096***	-7278.068***

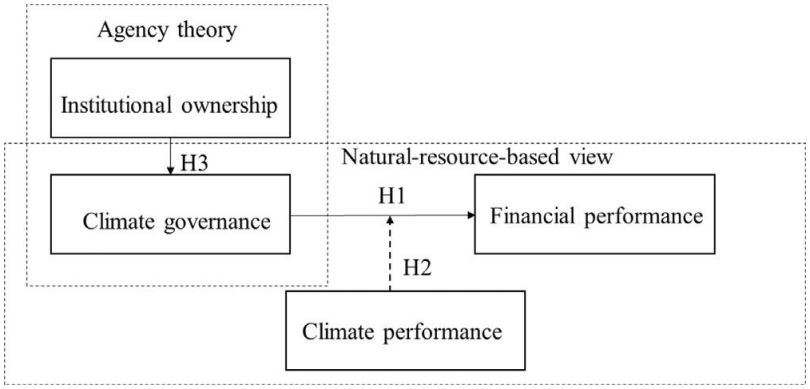

Figure 1: The research model (hypothesized relationships)