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RESEARCH ARTICLE

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Driving businesses towards a better climate: Macro and micro mechanisms to protect the planet

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Abstract

This study examines whether corporate commitment to climate change is driven by country-level factors related to cultural values and the legal system (LS) of a country. We also investigate the impact of corporate governance strength on climate change commitment and the extent to which there are moderating effects between corporate governance and cultural and LS influences. We use a large dataset of 21,564 firm-year observations of companies operating in the United States, UK, and China for the period 2013 to 2020 and develop a unique measure for climate change commitment using different proxies for measuring climate change practices. We find variations in climate change commitment among the three countries and that cultural values and LSs affect corporate commitment to climate change. Companies located in a socially oriented society, which are transparent and characterized by long-term orientation, are more strongly involved in climate change actions. The strength of corporate governance increases corporate commitment to climate change. Corporate governance also moderates some of the detrimental cultural influences on climate change commitment. These findings have implications for managers as they reveal that macro-level factors affect behavior and that corporate governance can help to moderate these factors.

KEYWORDS
climate change commitment, corporate governance, legal system, national cultural

1 | INTRODUCTION

The issue of climate change represents a significant problem to the planet that requires collaboration from organizations in countries with diverse cultures (Guest, 2010; Kim et al., 2022; Lemma et al., 2021; Luo & Tang, 2022). Governments all over the world are putting pressure on companies to demonstrate their responsibility and accountability to stakeholders by improving operations and practices that have an impact on climate change (Afrifa et al., 2020; Hollindale et al., 2019). Regulatory and normative pressures can motivate firms to implement environmental management practices, and this link is contingent on firms' environmental commitment and resources (Gunarathne et al., 2021; Nippa et al., 2021; Ozkan et al., 2022).

Extant literature shows that differences between legal systems (LSs) lead to differences in companies' environmental management decisions. For example, Liu et al. (2021) show that the LS of a country in which a company operates affects its renewable energy investment. Also, Andreou and Kellard (2021) demonstrate that firms headquartered in a civil law LS are more environmentally proactive than their

Abbreviations: CSR, corporate social responsibility; GHG, global greenhouse gas; SSE, Shanghai stock exchange.

counterparts. The national culture acts as a soft and implicit institution (Flipo et al., 2022; Ioannou & Serafeim, 2012) that affects managerial decisions concerning environmental issues, including corporate carbon performance (Kim et al., 2022; Luo & Tang, 2022; Miska et al., 2018; Prince et al., 2020). Therefore, country-level mechanisms (the LS and culture) can motivate companies to be more committed to climate change by implementing environmental management practices (Nippa et al., 2021; Wang et al., 2018). Moreover, the development of a firm's climate change strategy involves top managerial judgment and decision-making (Pinkse & Kolk, 2012). In this study, we assess the potential drivers of corporate climate change commitment at both the macro and micro level by considering the LS and cultural values in the countries that the firms operate and their corporate governance.

Motivated by the lack of adequate consideration of corporate commitment to climate change in the extant literature and the practical significance of our study that lies in its potential to inform strategic decision-making, shape regulatory frameworks, and sustainable business practices towards a better commitment to climate change, our study helps provide evidence that can guide companies and policymakers to tackle the climate change issue and enhance sustainable development. Our objectives in this article are threefold. First, we aim to explore whether variations in commitment to climate change by companies operating in the USA, UK, and China are caused by differences in the national culture and LSs. These major countries were chosen because of the significant importance of the United States, the UK, and China to the world economy and to international climate change policy (Farber, 2011). Our first research question explores the impact of cultural influences on corporate commitment to climate change in three cultural settings. The second research question examines the impact of the LS (common law vs. civil law) on corporate commitment to climate change. Third, we consider the role of corporate governance mechanisms in monitoring and enhancing firms' adoption of climate change policies. We also investigate whether corporate governance moderates the effects of culture and a LS on corporate commitment to climate change, that is, whether corporate governance plays as an institutional substitution or complement for the influence of country-level factors (i.e., the culture and LS) on climate commitment.

This paper contributes to the existing literature as follows. First, unlike prior research which is focused on the impact of national culture on corporate social responsibility (CSR) performance (García-Sánchez et al., 2016; Lu & Wang, 2021), carbon disclosure (Luo et al., 2018; Shinkle & Spencer, 2012), carbon performance (Kim et al., 2022; Luo & Tang, 2022; Muttakin et al., 2022), and integrated reporting (García-Sánchez et al., 2013), or on the effect of LSs on renewable energy investment (Liu et al., 2021), we specifically explore the impact of country-level factors (cultural factors and LS) and corporate governance on corporate commitment to climate change. We provide a comprehensive insight of the macro- and micro-level factors that affect corporate commitment to climate change.

Second, we contribute to the existing findings by providing new evidence on the joint effect of country-level mechanisms (i.e., the culture and LS) and corporate governance on climate commitment—which is still missing in prior research. We show that, in socially oriented societies, the existence of effective corporate governance system substitutes the influence of culture on corporate commitment to climate change. In other words, in companies with a weak corporate governance system, there is an institutional void, and in such cases, cultural predispositions appear to fill this void. We also find that in a masculine society, an effective corporate governance system offers incentives to managers to commit to climate change issues, but in a transparent culture, corporate commitment to climate change is high regardless of the effectiveness of the governance system. Finally, unlike the recent work by Albitar et al. (2023) that demonstrates the impact of eco-innovation and climate governance on corporate commitment to climate change, we show that the existence of a strong governance system reinforces the impact of the LS on corporate commitment to climate change. A country's LS works in tandem with corporate governance to enhance climate change commitment. Therefore, to the best of our knowledge, we are the first to explore and provide insightful evidence on the moderating effect of corporate governance on the relationship between country-level mechanisms (i.e., the culture and LS) and corporate commitment to climate commitment. Together, our evidence supports the theoretical underpinnings of the institutional theory and legal origin theory. While the institutional theory provides a theoretical framework to explain the influence of cultural norms on motivating companies to be more committed to climate change by implementing environmental management practices (Nippa et al., 2021), the legal origin theory helps to understand that the differences in LSs can lead to different degrees of accountability to stakeholders including different environmental management decisions (Liu et al., 2021; Andreou and Kellard). Combining both theories in our study, therefore, is of theoretical value in explaining whether regulatory and normative pressures can motivate firms to be more committed to climate change.

Third, as it is unclear what is considered an appropriate measurement for corporate commitment to climate change (and whether CO_2 emissions and carbon disclosure capture the real overall commitment to climate change), we argue that there is a need for a comprehensive measure that captures companies' practices addressing climate change issues and reflects the extent to which they are committed to climate change. As a result, unlike prior studies that proxy corporate climate change actions by either CO_2 emissions (Afrifa et al., 2020; Lin & Zhu, 2019; Nippa et al., 2021) or carbon disclosure (Ben-Amar & McIlkenny, 2015), we extend the measure for corporate climate change commitment provided by Albitar et al. (2023) by considering a more comprehensive measure of five components. (1) Does the company initiate a climate change policy that outlines its intention to help reduce global greenhouse gas (GHG) emissions? Companies that have such a policy will be more motivated to reduce their environmental damage and show commitment to climate change issues. (2) Is the company aware that climate change can lead to commercial risks and opportunities? Companies that understand climate change as an enterprise risk management case, which represents opportunities for sustainable development, will put more effort into addressing climate change issues (which reflects a commitment to climate change).

(3) Does the company report its CO_2 Scope 3 emissions (those emissions that are indirect)? Such reporting is voluntary, plus the data are hard to measure as it includes emissions that are not produced by the company itself (therefore, companies that report Scope 3 CO_2 emissions show more commitment to climate change). (4) Has the company set an emission reduction target year? Companies that set a target year for emission reduction are likely to strategically plan to limit the negative impact of their production activities on the environment by reducing their CO_2 emission levels (which reflects commitment to climate change). (5) Has the company improved its energy efficiency? This represents the various forms of mechanisms and procedures to improve energy use in operation efficiently. Companies that put effort into enhancing energy efficiency and using cleaner fuel sources show more commitment to climate change.

We have structured the remainder of this paper as follows. In Section 2, we discuss the theory and hypothesis development. In Section 3, we explain the research method, including data collection and sample, measurements, and model specifications. In Section 4, we discuss the findings, and Section 5 concludes our paper.

2 | THEORY AND HYPOTHESES DEVELOPMENT

2.1 | Theoretical underpinning

Institutional theory is concerned with the relationship between an organization and its environment and recognizes the influence of the environment on organizational behavior and processes (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Scott, 1995). Institutional theory is based on the opinion that organizations incorporate social and institutional beliefs to maintain their stability and legitimacy in society instead of achieving organizational efficiency (DiMaggio & Powell, 1983; Meyer & Rowan, 1977). Therefore, the efficiency incentive is not sufficient to explain why organizations are becoming more homogeneous. Institutional factors, such as regulations, culture, and societal expectations, shape individual and collective behaviors (North, 1990) that may affect how companies perceive and respond to climate challenges. Thus, companies' responses are not only driven by economic incentives but are also influenced by the institutional context in which they operate (North, 1990).

Scott (1995) identifies three elements existing on a continuum (from the formal, conscious aspects, to the taken-for-granted aspects of an institution): regulative, cultural cognitive, and normative elements. The regulative element refers to the existing regulations and laws of a national regulative environment that make and enforce rules to coerce organizations to conform—it is the most formal and powerful element in institutions. The cultural element provides a common framework of meaning that is associated with a particular institution. The normative element remains in the middle of the continuum and comprises the norms and values that provide a "prescriptive, evaluative and obligatory dimension" (Meyer & Rowan, 1977) and are widely accepted among institutions. Each of these components plays a role in establishing the values and norms that influence organizational behavior and processes, and they continue to be repeated, reaching a degree of stability and, finally, forming an "institution." Based on the arguments from DiMaggio and Powell (1983), Scott (1995) proposes neo-institutional theory and places great emphasis on the three levels of analysis: societal (global) institutions, governance structures of an organization and its industry peers, and actors (such as individuals and groups) (Ntim & Soobaroyen, 2013).

Based on the legal origin theory, differences between LSs can lead to differences in companies' practices (La Porta et al., 2008). This can enforce different degrees of accountability to stakeholders (Kim et al., 2022; Liu et al., 2021; Nippa et al., 2021). The theory explains that a common law system supports shareholder protection and a market-driven approach while a civil law system takes a stakeholder view with a more regulatory intervention in public policy. Thus, different LSs can lead to different environmental practices and environmental management decisions which affect corporate commitment to climate change.

International study scholars (e.g., El Ghoul et al., 2017; Elshandidy et al., 2015; Martínez-Ferrero & García-Sánchez, 2017; Miska et al., 2018) identify that a country's LS and cultural values are claimed to be the most essential factors (Elshandidy et al., 2015) that might explain the international differences in corporate CSR practice. However, Colwell and Joshi (2013) argue that institutional theory ignores the role of top management in companies. So, in this paper, we assess the potential drivers of corporate climate change commitment at both a micro and macro level by considering the LSs and cultural values of the countries where the firms operate and their corporate governance practice.

In this paper, the selected countries of the UK, the United States, and China show differences and commonalities in their approaches to support corporate commitment to climate change. While each nation has distinct cultural norms, legal frameworks, and corporate governance systems, they share a collective recognition of the need to address environmental concerns. The UK is often characterized by its stringent environmental regulations and proactive corporate sustainability initiatives. In the United States, a dynamic interplay between federal and state-level policies results in a diverse landscape of corporate climate commitments, often influenced by market-driven incentives. China is rapidly enhancing awareness of environmental challenges including climate change. While the drivers and levels of commitment may differ, all three countries are different in economic growth, cultural values, and environmental responsibilities. Understanding these distinctions and commonalities is crucial for shaping effective strategies that encourage enhanced corporate commitment to combat climate change across these influential nations.

2.2 | Hypotheses development

2.2.1 | *National culture* and *corporate commitment to climate change*

In international business studies, culture is frequently considered an informal institutional element that specifically addresses the cultural-cognitive pillar of institutions (Miska et al., 2018; Prince et al., 2020). Culture is defined as the "collective programming of the mind which distinguishes the members of one group or category of people from another" (Hofstede et al., 2005, p.3), and the national culture refers to the "collective programming of the mind acquired by growing up in particular country" (Hofstede et al., 2005, p.520). According to Scott (1995), the national culture is related to normative and cognitive forces with the prescriptive, evaluative, and obligatory dimensions of social life. The cognitive values of a country in which a business operates can enable or constrain the business strategies and activities (Campbell, 2007; Flipo et al., 2022) and such influence comes from the existing social obligations, social necessity, or the shared understanding of what is the proper behavior of an organization (Wicks, 2001).

Hofstede (1980, 2001) identifies five cultural dimensions—power distance, individualism/collectivism, uncertainty avoidance, masculinity/femininity, and short-term/long-term orientation, which have been employed to highlight the similarities and differences between countries. Hofstede et al. (2010) add indulgence as another dimension of Hofstede's model of national culture. Hofstede's dimensions have been widely used to assess the impact of national culture on corporate CSR reporting and engagement (e.g., Elshandidy et al., 2015; García-Sánchez et al., 2013; Orij, 2010). Previous research has found that culture, measured by either the holistic culture score or the individual dimension, acts as a soft and implicit institution (Ioannou & Serafeim, 2012), and is a significant driver of corporate strategies and accounting practice (Chen et al., 2015; García-Sánchez et al., 2016; Miska et al., 2018; Mohamed Adnan et al., 2018; Wang et al., 2018). For instance, it is evidenced that, based on Hofstede's dimensions of cultural values, companies from normative societies are more likely to issue a voluntary insurance statement of their sustainability report (Martínez-Ferrero & García-Sánchez, 2017), and cultural values have significantly high explanatory power over mandatory risk reporting variations between non-financial firms across Germany, UK, and the United States (Elshandidy et al., 2015). A study of 1598 international firms from 20 countries found that firms with higher values of collectivist, feminist, and uncertainty avoidance, and a lower power distance index, are more likely to publish CSR reports (García-Sánchez et al., 2016). By focusing on only the role of power distance, Luo et al. (2018) suggest that a lower concentration of power promotes more CSR and increases carbon reporting transparency and are more predisposed towards legitimation.

Power distance refers to the level of hierarchy and the distribution of power within a country. A large power distance indicates that the unequal distribution of power and positions of power are vertically stratified. Individuals with less power within the society accept and expect this unequal distribution of power and are less likely to challenge authority and rules (Boateng et al., 2021; García-Sánchez et al., 2013). In high power distance societies, citizens receive commands from authorities and those in position of authority expect conformity (Hofstede et al., 2010), whereas in low power distance societies, citizens collaborate with authorities and are better able to express their needs. Low power distance countries are more transparent and promote free exchange of ideas. Stakeholders, such as environmental groups and the public, are able to resist firms' climate policies that are not environmentally friendly (Luo & Tang, 2022). In high power distance countries, managers are egoistic and less committed to the welfare of their community (Luo & Tang, 2016) and they enhance information asymmetry between insiders and outsiders to protect their interests (Luo & Tang, 2022). However, in low power distance countries, managers are less likely to abuse their power to seek personal gains, and they feel more responsible for the development of their communities and the environment (Luo & Tang, 2022).

The individualism/collectivism dimension refers to the prevalence of individual values compared to collective values of a group of individuals. In an individualist society, the relationship between individuals is not close; in a collectivist society, people have closer relationships and think more about their behaviors as members of a society, thus showing a strong commitment to the society. Individualistic cultural orientation allows for greater individual enterprise, which may foster innovation and the development of green technologies (Luo & Tang, 2022; Muttakin et al., 2022). Individualist societies are more transparent, which helps non-profit organizations to engage in the development of climate actions and policies (Luo & Tang, 2022). On the other hand, in collective societies, members will have a sense of identity and profound responsibility to common cultural ideas (Hofstede et al., 2010). Therefore, in collective societies, community and environmental groups can influence firms to take voluntary action towards climate change (Muttakin et al., 2022).

The uncertainty avoidance dimension refers to a society's tolerance to uncertainty and ambiguity, and people's ability to cope with it (Hofstede et al., 2010). Individuals in a society with less tolerance to uncertainty prefer stability and need rules and formality to structure life (García-Sánchez et al., 2013). Stakeholders in a society with high uncertainty are risk averse and uncomfortable with the volatile costs of global warming and environment degradation. They rely on formalized policies and regulations and support corporate actions that are predictable and controllable (Luo & Tang, 2022). In contrast, societies low in uncertainty avoidance tolerate risks and accept them as part of life (Wang et al., 2021). Therefore, investment in innovation and green technologies depends on how susceptible people in a society are to the risks and uncertainty surrounding climate change.

The masculinity/femininity dimension reflects the role of women in the society and the preference towards assertiveness, aggressiveness, and competitiveness. A masculine culture is more assertive and aggressive, and individuals from a masculine culture are more motivated to achieve material success. In contrast, individuals from a feminine culture are usually more modest, and the focus is on the quality of life (García-Sánchez et al., 2013). Feminist societies emphasize

quality of life over economic growth (Hofstede et al., 2010). Engagement in climate change action and environmental protection is related to the quality of life (Luo & Tang, 2022). Therefore, in countries with greater gender equality, managers are more likely to be concerned with how their corporate activities affect the environment (Van der Laan Smith et al., 2005).

The short-/long-term orientation refers to the connections between the past, the present and the future. Individuals and societies with long-term orientation have a strong propensity to save and invest, to thriftiness and perseverance—they adapt to changes and new things quickly and are more likely to challenge authorities (Vitell et al., 1993). Countries with long-term orientation emphasize the establishment of long-term strategies to gain competitive advantage and attain sustainable development (Hofstede et al., 2010). Managers in long-term oriented societies are likely to promote innovation and green investment (Luo & Tang, 2022), (which shows a commitment to climate change). Finally, indulgence cultures support people's personal and corporate values, and their actions for personal gains and happiness (Hofstede et al., 2010). High-indulgence culture countries may prefer personal benefits over sustainability and environmental security (Muttakin et al., 2022).

In this paper, we complement previous studies and test the influence of cultural values on corporate commitment to climate change. Given the foregoing discussion, we propose the first hypothesis:

> **H1.** The national culture of a country is significantly associated with corporate commitment to climate change.

2.2.2 | LS and corporate commitment to climate change

The legal origin theory states that differences between LSs give rise to differences in the way companies operate (La Porta et al., 2008) and can enforce different degrees of accountability on stakeholders (Kim et al., 2022; Liu et al., 2021; Nippa et al., 2021). Common law countries support investor protection and laissez-faire market principles that dissuade centralized government intervention (Liu et al., 2021). Previous literature has argued that common law LSs offer better protection for shareholders (La Porta et al., 1997). In a common law system, a company is considered as an instrument to create and maximize shareholders' value. Therefore, in countries with a common law system, investors often enjoy greater protection of their interests (La Porta et al., 1997). In contrast, countries with a civil law system favor the complex requirements of a wider range of stakeholders (through centralized and interventional government control) and encourage the adoption of CSR principles and social wealth creation (Liu et al., 2021; Mahoney, 2001). As a consequence, firms in a civil law system are more concerned with the interests of stakeholders so that they can ensure access to critical resources and, therefore, their survival (Dhaliwal et al., 2012); they are also shown to be more environmentally proactive (Andreou & Kellard, 2021). Firms from civil law countries disclose more voluntary information on their social and environmental engagement (so that stakeholders are informed) (García-Sánchez et al., 2016; Goergen et al., 2019; Kolk & Pinkse, 2010; Smith et al., 2010). However, managerial opportunism and agency costs are higher in civil law countries, and such engagement in CSR reporting could be symbolic legitimacy. For instance, Zattoni and Cuomo (2008) suggest that the issuance of codes in civil law countries is prompted more by legitimation reasons; corporate codes are focused on the symbolic legitimacy instead of challenging managerial opportunism (as in common law countries). In the same vain, Djankov et al. (2008) suggest that managerial self-dealing is more likely in common law countries than in civil law countries. Countries with a civil law system, such as South Korea, have a short-termism view of CSR over sustainability. They exhibit a normative orientation in CSR instead of a strategic orientation (Kim et al., 2013).

Extant CSR studies find that firms can benefit from an investment in CSR with a lower cost of equity (El Ghoul et al., 2011) and better credit ratings (Bannier et al., 2022). Consequently, investors would benefit from corporate CSR activities. Moreover, common law countries appreciate free trade, free enterprise, and limited governmental control, which can lead to better environmental choices and innovation. As there are mixed arguments in the existing literature, it remains unclear how a LS affects corporate commitment to climate change. Thus, we propose our second nondirectional hypothesis:

> **H2.** The legal system of a country is significantly associated with corporate commitment to climate change.

2.2.3 | The role of a corporate governance system

The strength of a corporate governance system can play a role in corporate commitment to climate change. Corporate governance practice varies across institutional environments and reflects the differences in culture and legal origin (Zattoni & Cuomo, 2008), which entails effective mechanisms to minimize the tension among the different stakeholders. Within the Anglo–Saxon economies, like the United States and the UK, the corporate governance framework is designed to promote the concerns of a company's shareholders. This can empower managers to act in a manner that aligns with the interests of various parties, including shareholders and society (Ezeani et al., 2022, 2023; Nguyen et al., 2020). In recent CSR studies, it is widely agreed that corporate governance is a driver for better CSR performance and more transparent CSR disclosure (e.g., Albitar et al., 2020; Ben-Amar & McIlkenny, 2015; Hussain et al., 2016; Hussain et al., 2021; Liao et al., 2015, 2018; Rao & Tilt, 2016). For instance, existing research suggests that firms with a large board size are more likely to bring various perspectives and devote more effort and resources towards fulfilling their role in CSR (Haque & Ntim, 2018; Liao et al., 2018). Furthermore, the level of the monitoring and controlling functions of the board improves when board independence increases, which consequently leads to a better commitment to CSR (Haque & Ntim, 2018; Liao et al., 2018).

Board gender diversity strengthens the awareness of CSR issues within the business and helps companies systematically plan, organize, implement, and monitor CSR policies and practices—which positively influences CSR performance (Ben-Amar & McIlkenny, 2015; Hussain et al., 2016; Liao et al., 2015; Orazalin, 2019; Rao & Tilt, 2016). The presence of a CSR committee signals that a firm has a strong CSR orientation and is likely to support green strategies (Wang et al., 2021). Further, the independent external assurance of sustainability reports improves the quality of reporting and alleviates stakeholders' concerns (Al-Shaer & Zaman, 2019; Simnett et al., 2009). Integrating environmental and social performance criteria in executive compensation (CSR contracting) is a relatively recent practice in corporate governance (Al-Shaer & Zaman, 2019; Maas, 2018; Maas & Rosendaal, 2016). Flammer et al. (2019) find that CSR contracting promotes long-term orientation and leads to an increase in social and environmental initiatives, a reduction in emissions, and an increase in green innovations.

While these studies focus on one or multiple corporate governance mechanisms, Jamali et al. (2008), through a qualitative interpretive study, depict corporate governance as a pillar of CSR that drives managers to set goals and objectives for social and environmental issues. Since existing studies show inconclusive results (in terms of the role of different attributes of corporate governance on CSR) (Haque & Ntim, 2018; Prado-Lorenzo & García-Sánchez, 2010), it is useful to take a holistic view of the corporate governance effect. The strength of corporate governance system plays a monitoring role and protects stakeholders' interests by means of regulation, legal requirements, and voice of accountability (Liu et al., 2021). We expect that firms with an effective corporate governance system are more aware of climate change issues, can initiate emission reduction practice in a multinational scenario, and play a leadership role in a corporate response to climate threat. Given this, we propose the third hypothesis:

> **H3.** The strength of corporate governance is positively and significantly associated with corporate commitment to climate change.

3 | RESEARCH METHOD

3.1 | Sample selection

We use the Thomson One Banker to obtain a sample of firms listed on the FTSE all-share, NASDAQ all-share, and Shanghai stock exchange (SSE), covering the period 2013–2020. This allows us to examine corporate commitments to climate change issues over recent years, across the three nations. We use two datasets to collect our variables: Bloomberg database to collect climate commitment variables and the Eikon database to collect corporate governance variables and financial variables. We lose observations when we merge the two datasets collected from Bloomberg and Eikon, and due to missing data for some board and financial variables. Our final unbalanced sample consists of 15,972 firm-year observations in the United States, 2614 firm-year observations in the UK, and 2978 firm-year observations in China. The sample was chosen from 11 different industries: technology, telecommunication, health care, financials, real estate, consumer discretionary, consumer staples, industrials, basic materials, energy, and utilities.[1]

TABLE 1 Sample distribution.

Distribution of obs by country		
US	15,972	74.07%
UK	2614	12.12%
China	2978	13.81%
Total	21,564	100%
Distribution by year		
2013	1144	5.31%
2014	1170	5.43%
2015	1761	8.17%
2016	2413	11.19%
2017	3312	15.36%
2018	3583	16.62%
2019	4183	19.40%
2020	3998	18.54%
Total	21,564	100%
Distribution by industry		
Technology	1952	9.05%
Telecommunications	548	2.54%
Health care	2960	13.73%
Financials	3635	16.86%
Real estate	1539	7.14%
Consumer discretionary	3414	15.83%
Consumer staples	996	4.62%
Industrial	3580	16.60%
Basic material	1068	4.95%
Energy	1124	5.21%
Utilities	748	3.46%
Total	21,564	100%

Note: Variables are as defined in Appendix A.

Table 1 shows a sample distribution. We chose companies located in the United States, the UK, and China. Both the UK and the United States are at a relatively advanced stage of development in climate change practices (Ben-Amar & McIlkenny, 2015; Bui et al., 2020; Moussa et al., 2019). China is an economy that is placing an increased emphasis on economic growth which can be at the expense of social and environmental development (Adnan

[1]We include all industries that our sample firms operate in. We do not exclude the financial sector from the selected industries because our dependent variable represents the corporate commitment to climate change which is a voluntary practice in the three contexts examined in our study. Hence, the different regulatory system of the financial sector is less likely to affect the way companies respond to the climate change issue.

et al., 2018; Kim et al., 2022; Lin & Zhu, 2019; Liu et al., 2010). China has adopted several policies and actions in recent years to tackle climate change despite the challenges this creates on China's economic and social development.

3.2 | Variables definitions and measurement

3.2.1 | Corporate commitment to climate change

Our dependent variable is the corporate commitment to climate change. We complement the recent work by Albitar et al. (2023) by providing a more comprehensive measure for corporate climate change commitment. We develop an index computed as a composite score by totaling the five climate commitment components: (1) an indicator variable takes a value of 1 if the company initiates a climate change policy that outlines its intention to help reduce global emissions of GHGs. (2) Climate change commercial risk opportunities: an indicator variable takes a value of 1 if the company is aware that climate change can represent commercial risks or opportunities, 0 otherwise. Companies that are aware of climate risks and opportunities are likely to be more committed to climate change. (3) CO_2 equivalent emissions indirect Scope 3—an indicator variable takes a value of 1 if the company discloses its Scope 3 emissions, 0 otherwise. Companies that report their indirect Scope 3 emissions are likely to be more committed to climate change given that Scope 3 is still voluntary. (4) Emissions reduction target—an indicator variable takes a value of 1 if a firm sets a target year for emission reduction, and 0 otherwise. Companies that set targets to reduce their carbon emissions show more commitment to climate change. (5) An indicator variable takes a value of 1 if the company has put efforts to improve energy efficiency and drive energy from cleaner fuel sources that reduces GHG emissions, both direct emissions from fossil fuel consumption and indirect emissions from reduced electricity generation. The composite index is the sum of the five individual scores attainable by a firm for a specific year.

3.2.2 | Country-level variables

We followed previous literature in identifying the country-level effect (e.g., Gerged et al., 2023; Salem et al., 2021; Salem et al., 2023). We define two variables, LS and culture related to coercive and normative forces, respectively. We use the country LS to represent the coercive forces and measure it as an indicator variable that takes a value of 1 for common law countries (UK and United States) and 0 for code (civil) law countries (China) (Elshandidy et al., 2015; García-Sánchez et al., 2016; Martínez-Ferrero & García-Sánchez, 2017).[2]

Regarding the normative forces, we use the national culture dimensions proposed by Hofstede et al. (2005, 2010). These dimensions are power distance (PD) (which represents the level of hierarchy within a society); uncertainty avoidance (UA) (which identifies the level of preventing uncertainty in a society where a low uncertainty culture emphasizes a higher level of standardization); Individualism (IDV) (which represents the prevalence of individual values compared to group values); masculinity (MAS) (which represents the level of male dominance in a society); long-term orientation (LTO) (which represents the orientation of a society towards the future); and indulgence (IND) (which represents the extent to which a society is controlled by social values) (Martínez-Ferrero & García-Sánchez, 2017). We follow the previous approach by García-Sánchez et al. (2016) and Martínez-Ferrero and García-Sánchez (2017) and group cultural dimensions into a holistic culture score that reveals the level of cultural system development; we measure this as the mean value of LTO and IND and the inverse of IDV, MAS, UA, and PD. A high value represents a high level of cultural system development (Martínez-Ferrero & García-Sánchez, 2017) and hence, a greater impact of normative forces on corporate commitment to climate change.

We also apply alternative measures of culture following Orij (2010). We use the cultural score, secrecy (SEC), which represents the level of secrecy in a nation. It is calculated using the following formula $SEC = UA + PD - IDV$, where IDV reduces the level of secrecy and increases the level of transparency in a society, while UA and PD contribute positively to the secrecy score (Hope et al., 2008; Orij, 2010). We also use the generic type of culture score (TYP) following Gannon (2001), which represents the level of social orientation in a society and is calculated using the formula $TYP = IDV - PD$ where IDV contributes positively to TYP, while PD contributes negatively to TYP. Low levels of individualism (or high collectivism) and the dominance of power distance reflect a narrow view of group interest and a low level of social orientation in a society (Orij, 2010).[3]

3.2.3 | Internal governance variables

For our internal governance constructs, we use an indicator variable for the existence of sustainability committees on the board (SUSCOM), an indicator variable of whether a company publishes stand-alone sustainability reports (SUS_reporting), an indicator variable of whether sustainability reports are externally assured by an independent external audit (EXT_assurance), an indicator variable of whether a company provides incentives for the management of climate change issues (SUS_incentive), and the size of corporate boards (BODSIZE); we use an indicator variable that equals 1 if the number of board members is higher than the industry median 1, otherwise 0, the proportion of independent directors on the board (BODIND); we use an indicator variable that equals 1 if the percentage of independent directors on the board is higher than the industry median 1, otherwise 0, and the proportion of

[2]The distinctions between civil law and common law systems are based on argumentation techniques and approaches to legal process. Codes and legislation predominate with a civil law system, whereas the common law system entrusts substantial law-making powers to the court since the law is independent of the state and politics. See: https://ppp.worldbank.org/public-private-partnership/legislation-regulation/framework-assessment/legal-systems/common-vs-civil-law.

[3]We refrain from examining the impact of each cultural dimension and include the measures (discussed here) in the interest of achieving sound parsimony for our tables and the paper.

female directors on the board (BODDIV); we use an indicator variable that equals 1 if the percentage of female directors on the board is higher than the industry median 1, otherwise 0. Internal corporate governance index (CG_index) is computed as a composite score by totaling the seven internal governance components, that is, SUSCOM (0–1), SUS_reporting (0–1), EXT_assurance (0–1), SUS_incentive (0–1), BODSIZE (0–1), BODIND (0–1), and BODDIV (0–1). Hence, the composite score ranges from 0 to 7.

3.2.4 | Control variables

We control for firm-specific variables identified from prior studies as potential contributing factors of corporate commitment to climate change (e.g., Al-Shaer et al., 2022; Backman et al., 2017; Elshandidy et al., 2015; Tavakolifar et al., 2021). We control for firm size measure by the natural log of total assets. We measure liquidity as the sum of accounts receivable and inventory to total assets. R&D expenditure is measured by the natural log of research and development expenditure. Intangible asset intensity is measured by the total intangible divided by the total assets. Return on asset is measured by net income to total assets. Capital expenditure intensity is measured by capital expenditure divided by total assets. Free cash flow is measured by cash flow from operation divided by sales. We also control for each country's GDP growth.

3.3 | Empirical model

The country–industry–year fixed effect ordinal probit regression approach is utilized to investigate the research models since Climate_commit is a categorical variable that ranges between 0 and 5. This approach may reduce the risk of time-invariant endogeneity and omitted variable threats (Wooldridge, 2010).

Equation (1) examines the association between country factors (i.e., national culture and LS) and corporate governance, and climate change commitment:

$$\begin{aligned} Climate_{commit} = {} & \beta_0 + \beta_1 CG_{index} + \beta_2 Culture + \beta_3 LS + \beta_4 SIZE + \beta_5 LIQUID \\ & + \beta_6 R\&D_{exp} + \beta_7 INTANG_{intensity} + \beta_8 ROA + \beta_9 CAP_{intensity} \\ & + \beta_{10} FCF + \beta_{11} GDP_{growth} + \beta_{12} Country\ dummies \\ & + \beta_{13} Industry\ dummies + \beta_{14} Year\ dummies + \epsilon \end{aligned} \quad (1)$$

Equation (2) uses the alternative scores of cultures (i.e., SEC, TYP, LTO, and MAS):

$$\begin{aligned} Climate_{commit} = {} & \beta_0 + \beta_1 CG_{index} + \beta_2 SEC + \beta_3 TYP + \beta_4 LTO + \beta_5 MAS \\ & + \beta_6 LS + \beta_7 SIZE + \beta_8 LIQUID + \beta_9 R\&D_{exp} \\ & + \beta_{10} INTANG_{intensity} + \beta_{11} ROA + \beta_{12} CAP_{intensity} + \beta_{13} FCF \\ & + \beta_{14} GDP_{growth} + \beta_{15} Country\ dummies \\ & + \beta_{16} Industry\ dummies + \beta_{17} Year\ dummies + \epsilon \end{aligned} \quad (2)$$

Equation (3) examines the moderation role of CG_index on the relationship between the country-level mechanisms and climate change commitment:

$$\begin{aligned} Climate_{commit} = {} & \beta_0 + \beta_1 CG_{index} + \beta_2 Culture + \beta_3 LS + \beta_4 Culture * CG_{index} \\ & + \beta_5 LS * CG_{index} + \beta_6 SIZE + \beta_7 LIQUID + \beta_8 R\&D_{exp} \\ & + \beta_9 INTANG_{intensity} + \beta_{10} ROA + \beta_{11} CAP_{intensity} + \beta_{12} FCF \\ & + \beta_{13} GDP_{growth} + \beta_{14} Country\ dummies \\ & + \beta_{15} Industry\ dummies + \beta_{16} Year\ dummies + \epsilon \end{aligned} \quad (3)$$

We also create interactive variables between culture scores (see Equation 2) and CG_index in testing for the moderation effects. Appendix A provides a complete definition of the study variables.

4 | FINDINGS

4.1 | Descriptive statistics

Table 2 reports the mean values of the dependent variable by country, year, and industry. The table suggests that the three countries have increased their commitment to climate change in recent years. The highest mean values of Climate_commit are 1.982 for the United States, 3.403 for the UK, and 1.843 for China in 2020, and the second highest values are 1.801 for the United States in 2013, and 2.876 and 1.623 for the UK and China in 2019, respectively. It is noteworthy that the UK has the highest average score of Climate_commit than the other two nations. The UK is committed to tackle climate change and began to address climate change adaptation earlier than the United States or China (Farber, 2011). The UK government has set up an emissions target to bring GHG emissions to net zero by 2050. This policy has added pressure on companies to increase the practices related to climate change (Karim et al., 2021). Climate commitment scores for the UK and the USA were relatively higher in 2013 than for the following years (2014–2018). It could be because 2013 was the year where the discussion around the sustainable development goals was initiated. China has also experienced a jump in the climate commitment score in 2016 which could be due to the implementation of a series of environmental regulations in 2015 including "Water Pollution Prevention and Control Action Plan" and "The People's Republic of China's Severest Environmental Protection Law".

The average scores of Climate_commit by industry show that the utility sector has the highest average score for the United States (mean = 3.182) and the UK (mean = 4.373), and the second highest average score for China (mean = 2.017). However, the energy sector has the highest average score for China (mean = 2.152). The consumer staple sector has the second highest average score for the United States (mean = 2.457), and telecommunication has the second highest average score for the UK (mean = 3.683).

Table 3 reports the descriptive statistics of variables used in the study. Looking at cultural values, the United States and the UK have low scores for PD and LTO, whereas China's are high. On the other hand, the United States and the UK have high scores for IDV and IND, but China has low scores. Finally, all three countries have low scores for UA and high scores for MAS. Overall, the cultural dimensions show sufficient variations in their distributions. We find that the

TABLE 2 Climate commitment average distribution.

Climate commitment average by country and year			
Year	**US**	**UK**	**China**
2013	1.801	2.843	0.92
2014	1.791	2.684	1.042
2015	1.278	2.423	1.124
2016	1.045	2.395	1.588
2017	1.057	2.523	1.497
2018	1.132	2.584	1.52
2019	1.408	2.876	1.623
2020	1.982	3.403	1.843
Climate commitment average by country and industry			
Technology	1.327	1.821	1.273
Telecommunications	1.284	3.683	1.846
Health care	0.608	2.112	1.554
Financials	0.804	2.745	1.487
Real estate	1.583	2.918	1.369
Consumer discretionary	1.37	2.795	1.346
Consumer staples	2.457	3.333	1.484
Industrial	1.525	2.798	1.628
Basic material	2.115	2.549	1.684
Energy	1.743	2.235	2.152
Utilities	3.182	4.373	2.017

Note: Variables are as defined in Appendix A.

TABLE 3 Descriptive statistics.

Variable	Mean	SD	Min	Max
Climate_commit	0.668	1.041	0.000	5.000
SUSCOM	0.319	0.466	0.000	1.000
SUS_reporting	0.406	0.491	0.000	1.000
EXT_assurance	0.109	0.311	0.000	1.000
SUS_incentive	0.151	0.358	0.000	1.000
BODSIZE	9.257	2.612	1.000	33.000
BODIND	0.709	0.192	0.000	1.000
BODDIV	0.504	0.286	0.010	1.000
CG_index	2.232	1.527	0.000	7.000
LS	0.862	0.345	0.000	1.000
SIZE	22.064	2.178	17.164	28.060
LIQUID	2.595	2.810	0.289	18.040
R&D_exp	18.250	1.927	13.305	23.129
INTANG_intensity	0.135	0.151	0.000	0.732
ROA	4.113	10.793	−54.950	27.380
CAP_intensity	0.040	0.043	0.000	0.233
FCF	0.059	0.135	−0.642	0.344
GDP_growth	12.666	22.397	−3.642	69.000
Culture values	**US**	**UK**	**China**	
PD	40	35	80	
IDV	91	89	20	
MAS	62	66	66	
UA	46	35	30	
LTO	26	51	87	
IND	68	69	24	

Note: Variables are as defined in Appendix A.

mean value of CG_index is 2.232, and it ranges between 0 and 7. We also include variables to control for the impact of macro forces (i.e., culture and LS) and corporate governance on corporate commitment to climate change. We provide the statistical summary of the control variables in Table 3.

Panel A in Table 4 shows the bivariate correlations between culture variables. The coefficients obtained are highly correlated among culture variables. To correct the multicollinearity issue, we follow the previous approach by Martínez-Ferrero and García-Sánchez (2017) and García-Sánchez et al. (2016) and group all culture dimensions into a holistic variable (i.e., culture) which we measured by calculating the mean value of culture and the six dimensions by country. Table 4, Panel B reports the Pearson correlation between the variables declared in our analysis. It shows that Culture, LS, and CG_index have significant positive correlations with Climate_commit. Table 4, Panel C shows the Pearson correlation coefficients when including culture scores (i.e., SEC, TYP, LTO, and MAS). Due to high correlation between culture scores, we use the stepwise regression approach (i.e., we include culture proxies one by one in the regression tests). We examine the multicollinearity threat and calculate the variance inflation factor (VIF). Accordingly, the results reveal that the VIF value ranges between 2.05 and 2.97, which is lower than the suggested cut-off value of 10 (Wooldridge, 2013).

4.2 | Multivariate analysis

We examined the baseline research models using the country–industry–year FE ordinal probit regression analysis. Table 5 tests the impact of country-level mechanisms and corporate governance on corporate commitment to climate change. We use the stepwise regression approach where, in Model 5.1, we test the impact of Culture and other control variables on climate commitment; Model 5.2 tests the impact of LS and other control variables on climate commitment; Model 5.3 tests the impact of CG_index and control variables on climate commitment; and Model 5.4 includes the three variables (i.e., Culture, LS, and CG_index). Results show that Culture is significant ($p < .01$ in Models 5.1 and 5.4) and positively associated with Climate_commit, LS is significant ($p < .01$ in Models 5.2 and 5.4) and positively associated with Climate_commit, and CG_index is significant ($p < .01$ in Models 5.3 and 5.4) and positively associated with Climate_commit. More specifically, we find that a 1%-point increase in cultural development score would increase corporate commitment to climate change by 0.073%, and companies operating in a common law

TABLE 4 Correlation matrix.

Panel A																		
Bivariate correlations between culture variables																		
Power distance (PD)	1																	
Individualism (IDV)	.8210*	1																
Masculinity (MAS)	.1541*	−.4300*	1															
Uncertainty avoidance (UA)	−.9912*	−.7754*	−.2367*	1														
Long-term orientation (LTO)	−.9359*	−.9678*	.1889*	.9094*	1													
Indulgence (IND)	−.0201*	.5478*	−.9909*	.1035*	−.3196*	1												
Panel B[a]																		
Climate_commit	1																	
Culture	.0357*	1																
LS	.1411*	−.9105*	1															
CG_index	.5279*	.1066*	.0093	1														
SIZE	.3204*	.4313*	−.4803*	.4624*	1													
LIQUID	−.1986*	−.1589*	.1157*	−.2374*	−.3856*	1												
R&D_*exp*	.2795*	.3483*	−.3676*	.2983*	.2785*	−.2092*	1											
INTANG_intensity	.0054	−.1757*	.2330*	−.1221*	−.2412*	−.0715*	−.1113*	1										
ROA	.1126*	.1152*	−.0818*	.1228*	.1738*	−.2857*	.1630*	.1097*	1									
CAP_intensity	.0675*	.0156	−.0229*	.0056	.0536*	−.1869*	−.0177	−.1861*	.0522*	1								
FCF	.1497*	.0632*	−.0267*	.1691*	.2868*	−.3306*	.2086*	.0501*	.4911*	.2159*	1							
GDP_growth	.1662*	.5843*	−.2026*	.2642*	.0906*	−.1537*	.1386*	.0463*	.1249*	−.0018	.1097*	1						
Panel C[b]																		
Climate_commit	1																	
SEC	.2177*	1																
TYP	−.2043*	−.7095*	1															
LTO	.1559*	.8386*	−.2141*	1														
MAS	.2248*	.6759*	−.9866*	.1889*	1													
LS	0.1411*	.2422*	−.8502*	−.3089*	.8756*	1												
CG_index	.5279*	.2649*	−.1427*	.2608*	.1420*	.0093	1											
SIZE	.3204*	−.1219*	.4083*	.1383*	−.4256*	−.4803*	.4624*	1										
LIQUID	−.1986*	−.0965*	−.0309*	−.1584*	.0383*	.1157*	−.2374*	−.3856*	1									
R&D_exp	.2795*	−.1323*	.3495*	.1844*	−.3570*	−.3676*	.2983*	.6785*	−.2092*	1								
INTANG_intensity	.0054	.1494*	−.2414*	.0188*	.2488*	.2330*	−.1221*	−.2412*	−.0715*	−.1113*	1							
ROA	.1126*	.0797*	.0195*	.1265*	−.0258*	−.0818*	.1228*	.1738*	−.2857*	.1630*	.1097*	1						

TABLE 4 (Continued)

Panel C[b]															
CAP_intensity	.0675*	−.0121	.0204*	−.0027	−.0250*	−.0229*	.0056	.0536*	−.1869*	−.0177	−.1861*	.0522*	1		
FCF	.1497*	.0868*	−.0241*	.1024*	.0212*	−.0267*	.1691*	.2868*	−.3306*	.2086*	.0501*	.7911*	.2159*	1	
GDP_growth	.1662*	.6874*	−.3166*	.6900*	.2936*	−.2026*	.2642*	.0906*	−.1537*	.1386*	.0463*	.1249*	−.0018	.1097*	1

[a]To correct the multicollinearity problems, we follow the previous approach of García-Sánchez et al. (2016) and Martínez-Ferrero and García-Sánchez (2017) and group all the dimensions into a global variable, "Culture." This is created by calculating the mean value of these six dimensions by country. Variables are as defined in Appendix A.

[b]Due to high correlation between culture proxies, we use the stepwise regression approach, that is, we include culture proxies one by one in regression tests. Variables are as defined in Appendix A.

*$p < .05$.

TABLE 5 The impact of country-level mechanisms and governance on corporate commitment to climate change.

Variable	Climate_commit *Model 5.1*	Climate_commit *Model 5.2*	Climate_commit *Model 5.3*	Climate_commit *Model 5.4*
Culture	0.0734***			0.0740***
	[4.50]			[4.86]
LS		2.1543***		7.5659***
		[5.18]		[5.87]
CG_index			0.3567***	0.3564***
			[17.19]	[17.24]
SIZE	0.2907***	0.2894***	0.1762***	0.1772***
	[13.75]	[13.77]	[9.19]	[9.21]
LIQUID	−0.0124	−0.013	−0.0067	−0.0062
	[−1.45]	[−1.51]	[−0.93]	[−0.86]
R&D_exp	0.0411**	0.0405**	0.0338**	0.0344**
	[2.55]	[2.52]	[2.37]	[2.42]
INTANG_intensity	−0.2314	−0.2202	−0.1039	−0.1134
	[−1.48]	[−1.41]	[−0.76]	[−0.83]
ROA	0.0019	0.0019	0.0012	0.0012
	[1.05]	[1.03]	[0.75]	[0.78]
CAP_intensity	0.9353*	0.9481*	0.7866*	0.7791*
	[1.93]	[1.95]	[1.78]	[1.77]
FCF	0.0834	0.0959	0.0344	0.0207
	[0.43]	[0.49]	[0.20]	[0.12]
GDP_growth	−0.0585***	0.0021	0.0075	−0.0537***
	[−4.19]	[0.24]	[0.87]	[−4.03]
Country fixed effect	Included	Included	Included	Included
Industry fixed effect	Included	Included	Included	Included
Year fixed effect	Included	Included	Included	Included
Intercept	−1.7871	−6.9422***	−5.7240***	−0.5141
	[−1.42]	[−13.00]	[−12.20]	[−0.45]
R-squared	0.585	0.585	0.585	0.592

Note: *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively. Variables are as defined in Appendix A.

LS, where the LS is measured by an indicator variable equal to 1 for common law and 0 for code law countries, would increase climate commitment by 2.154%. Similarly, a 1%-point increase in CG_index, measured by a composite score by totaling the seven internal governance components that reflect the effectiveness of corporate governance system, would increase climate commitment by 0.356%. The findings support the first hypothesis and show that the stronger the culture and LS, the higher the corporate commitment to climate change. The findings also support the second hypothesis that the strength of corporate governance enhances corporate commitment to climate change.

In Table 6, we replace the variable "Culture" with culture scores (i.e., SEC, TYP, LTO, and MAS). We use the stepwise regression and include them one by one in the regression tests to deal with high collinearity among cultural dimensions. Hence, Model 6.1 tests the impact of SEC, LS, and CG_index on Climate_commit; Model 6.2 tests the impact of TYP, LS, and CG_index on Climate_commit; Model 6.3 tests the impact of LTO, LS, and CG_index on Climate_commit; and Model 6.4 tests the impact of MAS, LS, and CG_index on Climate_commit. Results show that SEC is significant ($p < .01$ in Model 6.1) and negatively associated with Climate_commit, suggesting that companies located in less transparent societies are less likely to be committed to climate change. TYP is significant ($p < .01$ in Model 6.2) and positively associated with Climate_commit. TYP is a combination of positive IDV score and negative PD score (Orij, 2010), and it represents the social orientation of a society and the level of engagement with stakeholders. Therefore, companies located in a socially oriented society are more likely to be committed to climate change. LTO is significant ($p < .01$ in Model 6.3) and positively associated with Climate_commit. The results suggest that companies located in society that is long-term oriented are more likely to be committed to climate change. Finally, MAS is insignificant in Model 6.4 and negatively associated with Climate_commit, suggesting

TABLE 6 Robustness test—replicating the baseline findings using an alternative measure of culture.

Variable	Climate_commit *Model 6.1*	Climate_commit *Model 6.2*	Climate_commit *Model 6.3*	Climate_commit *Model 6.4*
SEC	−0.0740***			
	[−4.86]			
TYP		0.0740***		
		[4.86]		
LTO			0.2375***	
			[2.93]	
MAS				−0.0069
				[−0.32]
LS	6.8254***	6.8254***	1.2914***	1.6659
	[5.96]	[5.96]	[12.64]	[1.51]
CG_index	0.3564***	0.3564***	0.3567***	0.3567***
	[17.24]	[17.24]	[17.19]	[17.19]
SIZE	0.1772***	0.1772***	0.1762***	0.1762***
	[9.21]	[9.21]	[9.19]	[9.19]
LIQUID	−0.0062	−0.0062	−0.0067	−0.0067
	[−0.86]	[−0.86]	[−0.93]	[−0.93]
R&D_exp	0.0344**	0.0344**	0.0338**	0.0338**
	[2.42]	[2.42]	[2.37]	[2.37]
INTANG_intensity	−0.1134	−0.1134	−0.1039	−0.1039
	[−0.83]	[−0.83]	[−0.76]	[−0.76]
ROA	0.0012	0.0012	0.0012	0.0012
	[0.78]	[0.78]	[0.75]	[0.75]
CAP_intensity	0.7791*	0.7791*	0.7866*	0.7866*
	[1.77]	[1.77]	[1.78]	[1.78]
FCF	0.0207	0.0207	0.0344	0.0344
	[0.12]	[0.12]	[0.20]	[0.20]
GDP_growth	−0.0537***	−0.0537***	0.0075	0.0075
	[−4.03]	[−4.03]	[0.87]	[0.87]
Country fixed effect	Included	Included	Included	Included
Industry fixed effect	Included	Included	Included	Included
Year fixed effect	Included	Included	Included	Included
Intercept	−5.1791***	−10.0662***	−5.0997***	−5.5853***
	[−10.86]	[−9.82]	[−2.80]	[−11.31]
R-squared	0.575	0.575	0.575	0.575

Note: *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively. Variables are as defined in Appendix A.

that the level of masculinity in a society does not affect corporate commitment to climate change.

Results also show that LS is significant ($p < .01$ in Models 6.1–6.3) and positively associated with Climate_commit, suggesting that companies located in countries with effective laws and enforcement mechanisms are more committed to climate change. Also, CG_index is significant ($p < .01$ in Models 6.1–6.4) and positively associated with Climate_commit, suggesting that effective corporate governance increases climate change commitment. Results are consistent with the baseline tests and confirm our hypotheses.

Table 7 tests the joint effect of country-level mechanisms (i.e., culture and LS) and corporate governance on climate commitment. Table 7 reports the coefficients of culture proxies, LS, and CG_index and the interactive variables SEC *CG_index (Model 7.1), TYP* CG_index (Model 7.2), LTO* CG_index (Model 7.3), MAS* CG_index (Model 7.4), Culture *CG_index (Model 7.5), and LS* CG_index (Model 7.6) on climate commitment. Consistent with the results in Tables 5 and 6, Models 7.1–7.6 in Table 7 confirm that the adoption of good corporate governance practice increases corporate commitment to climate change.

TABLE 7 Testing for the joint effect of country-level mechanisms and CG.

	Climate_commit *Model 7.1*	Climate_commit *Model 7.2*	Climate_commit *Model 7.3*	Climate_commit *Model 7.4*	Climate_commit *Model 7.5*	Climate_commit *Model 7.6*
CG_index	0.3580***	0.6673***	0.8573***	0.1295***	0.1835***	0.0721*
	[17.13]	[8.22]	[4.97]	[2.76]	[5.26]	[1.74]
SEC	−0.0755***					
	[−4.38]					
SEC* CG_index	0.0005					
	[0.33]					
TYP		0.0929***				
		[5.54]				
TYP* CG_index		−0.0056***				
		[−4.00]				
LTO			0.2690***			
			[3.17]			
LTO* CG_index			−0.0181***			
			[−2.94]			
MAS				0.0007		
				[0.11]		
MAS* CG_index				0.0043***		
				[5.21]		
Culture					0.0829***	
					[6.65]	
Culture* CG_index					−0.0025***	
					[−7.63]	
LS						0.1438
						[0.36]
LS* CG_index						0.2332***
						[6.00]
SIZE	0.1772***	0.1734***	0.1737***	0.1701***	0.1682***	0.1567***
	[9.21]	[8.99]	[9.06]	[8.84]	[8.75]	[9.68]
LIQUID	−0.0062	−0.0059	−0.0071	−0.0064	−0.0066	0.002
	[−0.85]	[−0.82]	[−0.97]	[−0.88]	[−0.92]	[0.25]
R&D_exp	0.0344**	0.0351**	0.0333**	0.0350**	0.0347**	0.0425***
	[2.43]	[2.50]	[2.34]	[2.49]	[2.46]	[3.22]
INTANG_intensity	−0.1122	−0.1121	−0.1194	−0.1066	−0.1178	−0.04
	[−0.82]	[−0.83]	[−0.86]	[−0.79]	[−0.87]	[−0.33]
ROA	0.0012	0.0007	0.0008	0.0004	0.0001	−0.0003
	[0.78]	[0.43]	[0.51]	[0.27]	[0.07]	[−0.18]
CAP_intensity	0.7873*	0.8884**	0.7574*	0.9296**	0.9110**	0.7384*
	[1.78]	[2.03]	[1.70]	[2.12]	[2.08]	[1.78]
FCF	0.0216	0.0512	0.0407	0.0799	0.085	−0.0939
	[0.13]	[0.31]	[0.24]	[0.48]	[0.51]	[−0.48]
GDP_growth	−0.0540***	−0.0520***	0.0119	0.0151*	0.0183**	−0.0463***
	[−3.98]	[−3.93]	[1.42]	[1.79]	[2.19]	[−3.65]
Country fixed effect	Included	Included	Included	Included	Included	Included
Industry fixed effect	Included	Included	Included	Included	Included	Included
Year fixed effect	Included	Included	Included	Included	Included	Included
Intercept	−5.1865***	−11.1481***	−13.6359***	−5.3728***	−5.2428***	0.8475

TABLE 7 (Continued)

	Climate_commit *Model 7.1*	Climate_commit *Model 7.2*	Climate_commit *Model 7.3*	Climate_commit *Model 7.4*	Climate_commit *Model 7.5*	Climate_commit *Model 7.6*
	[−10.88]	[−10.13]	[−5.61]	[−11.20]	[−10.93]	[0.89]
R-squared	0.575	0.581	0.578	0.58	0.585	0.587

Note: *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively. Variables are as defined in Appendix A.

With the interaction between culture scores and CG_index, we find that the individual effect of SEC is significant ($p < .01$ in Model 7.1) and negatively associated with Climate_commit, whereas the interactive variable SEC* CG_index is insignificant, which suggests that SEC has an impact regardless of the presence of CG_index. The individual effect of TYP is significant ($p < .01$ in Model 7.2) and positively associated with Climate_commit, whereas the interactive variable TYP* CG_index is significant ($p < 0.01$ in Model 7.2) and negatively associated with Climate_commit. The individual effect of LTO is significant ($p < 0.01$ in Model 7.3) and positively associated with Climate_commit, whereas the interactive variable LTO* CG_index is significant ($p < 0.01$ in Model 7.3) and negatively associated with Climate_commit. The results suggest that the effects of TYP and LTO are more pronounced in countries without strong internal corporate governance. This is because without strong CG, there is an institutional void and, when this occurs, cultural predispositions (such as TYP and LTO) appear to fill the void (Luo & Tang, 2022). The individual effect of MAS is insignificant, whereas the interactive variable MAS* CG_index is significant ($p < .01$ in Model 7.4) and positively associated with Climate_commit, which suggests that strong corporate governance system gives incentives to managers in masculine societies to commit to climate change issues. The composite variable, Culture, is significant ($p < .01$ in Model 7.5) and positively associated with Climate_commit, whereas the interactive variable Culture* CG_index is significant ($p < .01$ in Model 7.5) and negatively associated with Climate_commit.

The results are economically significant. For example, in Model 7.2, the effect of CG_index on Climate_commit is 0.667 whereas the effect of TYP* CG_index is 0.661 (i.e., the sum of 0.667 and −0.006). In Model 7.3, the effect of CG_index on Climate_commit is 0.857, whereas the effect of LTO* CG_index is 0.839 (i.e., the sum of 0.857 and −0.018). These coefficients suggest that effective corporate governance increases corporate commitment to climate change. However, the joint effects of CG and TYP, and CG and LTO on climate commitment are lower when corporate governance system is stronger, suggesting a moderating effect of CG_index on the association between these cultural values and corporate climate commitment.

Regarding the interaction between LS and CG_index, we find that the interactive variable LS* CG_index is significant ($p < .01$ in Model 7.6) and positively associated with Climate_commit, whereas the individual variable LS is insignificant. The positive and significant interaction suggests that the existence of a strong governance system reinforces the impact of the LS on corporate commitment to climate change. This result is economically significant as the effect of CG_index on Climate_commit is 0.072, whereas the effect of LS* CG_index is 0.305 (i.e., the sum of 0.072 and 0.233). In sum, these findings suggest that corporate governance has a moderating influence on the relationship between country-level factors and Climate_commit.

The findings show that corporate governance moderates the impact of country-level mechanisms on corporate commitment to climate change. Socially oriented societies with a long-term vision are more likely to be committed to climate change issues and their effects can substitute the role that effective governance plays in corporate adherence to climate change issues. The LS in a country works in tandem with corporate governance to enhance climate change commitment, whereas, under transparent cultures, corporate commitment to climate change is high regardless of the effectiveness of the governance system. Overall, the findings confirm the moderation role of corporate governance on the impact of country-level mechanisms (i.e., culture and LS) on corporate commitment to climate change.

We further explore industry influence on the impact of country-level mechanisms and corporate governance on corporate commitment to climate change. Firms from environmentally sensitive industries possess traits that are different from those in other industries, and these can determine a company's commitment to climate change. We divide the sample into environmentally sensitive versus insensitive industries, following Tang and Luo (2014). We include utilities (GIC 5510), energy (GIC 1010), and materials (GIC 1510) industries as environmentally sensitive industries. We report the results in Table 8 and show that companies operating in environmentally sensitive sectors, national culture, have no impact on corporate commitment to climate change, whereas the LS and corporate governance mechanisms have a significant and positive impact on climate commitment. The results indicate that in countries with a strong LS and governance mechanisms, companies are likely to commit to climate change actions, but the national culture of these countries has no effect on corporate commitment to climate issues (e.g., whether societies are socially oriented or not, the existence of strong governance mechanisms and rigid laws are likely to add pressure on those companies with high emissions to show their commitment to climate change). Environmentally sensitive industries can be overwhelmed without a multifaceted policy response and government support. The existence of regulatory policies and consultations covering all the emitting sectors is likely to affect a company's implementation to climate change strategy from these sectors.

TABLE 8 Testing for the industry effect.

	Environmentally sensitive industry					Non-sensitive industry				
	Climate_com *Model 8.1*	Climate_com *Model 8.2*	Climate_com *Model 8.3*	Climate_com *Model 8.4*	Climate_com *Model 8.5*	Climate_com *Model 8.6*	Climate_com *Model 8.7*	Climate_com *Model 8.8*	Climate_com *Model 8.9*	Climate_com *Model 8.10*
Culture	0.0228					0.0597***				
	[0.72]					[3.60]				
SEC		−0.0228					−0.0597***			
		[−0.72]					[−3.60]			
TYP			0.0228					0.0597***		
			[0.72]					[3.60]		
LTO				0.1982					−0.0177	
				[1.07]					[−0.25]	
MAS					0.0661					−0.0059
					[1.07]					[−0.25]
LS	5.2871**	5.0587*	5.0587**	2.2874***	−1.2803	6.1601***	5.5627***	5.5627***	1.1678***	1.4861*
	[2.77]	[1.87]	[2.87]	[8.43]	[−0.40]	[4.18]	[4.22]	[4.22]	[11.00]	[2.22]
CG_index	0.4111***	0.4111***	0.4111***	0.4108***	0.4108***	0.7313***	0.7313***	0.7313***	0.7315***	0.7315***
	[7.91]	[7.91]	[7.91]	[7.91]	[7.91]	[36.48]	[36.48]	[36.48]	[36.42]	[36.42]
SIZE	0.4940***	0.4940***	0.4940***	0.4927***	0.4927***	0.2643***	0.2643***	0.2643***	0.2639***	0.2639***
	[7.65]	[7.65]	[7.65]	[7.65]	[7.65]	[11.67]	[11.67]	[11.67]	[11.63]	[11.63]
LIQUID	0.0392	0.0392	0.0392	0.0364	0.0364	−0.0145	−0.0145	−0.0145	−0.0145	−0.0145
	[0.90]	[0.90]	[0.90]	[0.84]	[0.84]	[−1.55]	[−1.55]	[−1.55]	[−1.55]	[−1.55]
R&D_*exp*	0.0063	0.0063	0.0063	0.0063	0.0063	0.0287	0.0287	0.0287	0.0278	0.0278
	[0.14]	[0.14]	[0.14]	[0.14]	[0.14]	[1.53]	[1.53]	[1.53]	[1.48]	[1.48]
INTANG_*intensity*	−0.3142	−0.3142	−0.3142	−0.3257	−0.3257	−0.3493**	−0.3493**	−0.3493**	−0.3407**	−0.3407**
	[−0.57]	[−0.57]	[−0.57]	[−0.59]	[−0.59]	[−2.13]	[−2.13]	[−2.13]	[−2.08]	[−2.08]
ROA	0.0016	0.0016	0.0016	0.002	0.002	0.0044*	0.0044*	0.0044*	0.0043*	0.0043*
	[0.23]	[0.23]	[0.23]	[0.28]	[0.28]	[1.87]	[1.87]	[1.87]	[1.82]	[1.82]
CAP_intensity	0.3811	0.3811	0.3811	0.348	0.348	1.5190***	1.5190***	1.5190***	1.5575***	1.5575***
	[0.32]	[0.32]	[0.32]	[0.29]	[0.29]	[2.64]	[2.64]	[2.64]	[2.70]	[2.70]
FCF	0.4462	0.4462	0.4462	0.4473	0.4473	0.1043	0.1043	0.1043	0.1166	0.1166
	[0.67]	[0.67]	[0.67]	[0.67]	[0.67]	[0.43]	[0.43]	[0.43]	[0.48]	[0.48]
GDP_growth	−0.0476	−0.0476	−0.0476	−0.0279	−0.0279	−0.0383**	−0.0383**	−0.0383**	0.01	0.01
	[−1.31]	[−1.31]	[−1.31]	[−1.15]	[−1.15]	[−2.35]	[−2.35]	[−2.35]	[1.08]	[1.08]
Country fixed effect	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included

TABLE 8 (Continued)

	Environmentally sensitive industry					Non-sensitive industry				
	Climate_com *Model 8.1*	**Climate_com** *Model 8.2*	**Climate_com** *Model 8.3*	**Climate_com** *Model 8.4*	**Climate_com** *Model 8.5*	**Climate_com** *Model 8.6*	**Climate_com** *Model 8.7*	**Climate_com** *Model 8.8*	**Climate_com** *Model 8.9*	**Climate_com** *Model 8.10*
Industry fixed effect	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Year fixed effect	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Intercept	−9.5735***	−11.0123***	−12.5195***	−17.1132***	−12.4884***	−3.0168**	−6.7806***	−10.7236***	−6.6581***	−6.6581***
	[−3.58]	[−7.18]	[−5.19]	[−3.34]	[−8.24]	[−2.35]	[−12.06]	[−9.53]	[−3.32]	[−3.32]
R-squared	0.584	0.584	0.584	0.584	0.584	0.688	0.688	0.688	0.688	0.688
N	2870	2870	2870	2870	2870	18,420	18,420	18,420	18,420	18,420

Note: Following Tang and Luo (2014), environmental sensitive industries include utilities (GIC 5510), energy (GIC 1010), and materials (GIC 1510) industries. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively. Variables are as defined in Appendix A.

TABLE 9 Testing for endogeneity using the PSM approach.

Variable	Climate_commit *Model 9.1*	Climate_commit *Model 9.2*	Climate_commit *Model 9.3*	Climate_commit *Model 9.4*	Climate_commit *Model 9.5*
Culture	0.0912***				
	[11.98]				
SEC		−0.0912***			
		[−11.98]			
TYP			0.0912***		
			[11.98]		
LTO				0.7716***	
				[11.85]	
MAS					0.2572
					[1.85]
LS	10.4682***	9.5557***	9.5557***	1.9258***	−11.9629***
	[18.96]	[19.06]	[19.06]	[18.56]	[−10.83]
CG_index	0.4207***	0.4207***	0.4207***	0.4498***	0.4498***
	[17.22]	[17.22]	[17.22]	[18.04]	[18.04]
SIZE	0.2359***	0.2359***	0.2359***	0.2185***	0.2185***
	[9.88]	[9.88]	[9.88]	[8.99]	[8.99]
LIQUID	−0.0176	−0.0176	−0.0176	−0.0129	−0.0129
	[−1.14]	[−1.14]	[−1.14]	[−0.81]	[−0.81]
R&D_exp	0.0409**	0.0409**	0.0409**	0.0511***	0.0511***
	[2.24]	[2.24]	[2.24]	[2.75]	[2.75]
INTANG_intensity	0.1489	0.1489	0.1489	0.2349	0.2349
	[0.81]	[0.81]	[0.81]	[1.26]	[1.26]
ROA	0.0072**	0.0072**	0.0072**	0.004	0.004
	[2.09]	[2.09]	[2.09]	[1.12]	[1.12]
CAP_intensity	0.1803	0.1803	0.1803	−0.1291	−0.1291
	[0.29]	[0.29]	[0.29]	[−0.20]	[−0.20]
FCF	0.125	0.125	0.125	0.5214	0.5214
	[0.36]	[0.36]	[0.36]	[1.45]	[1.45]
GDP_growth	−0.0999***	−0.0999***	−0.0999***	−0.0982***	−0.0982***
	[−12.24]	[−12.24]	[−12.24]	[−11.67]	[−11.67]
Country fixed effect	Included	Included	Included	Included	Included
Industry fixed effect	Included	Included	Included	Included	Included
Year fixed effect	Included	Included	Included	Included	Included
Intercept	−0.3229	−6.0714***	−12.0937***	−28.3359***	−10.3321***
	[−0.49]	[−11.67]	[−15.67]	[−15.44]	[−18.77]
R-squared	0.521	0.543	0.541	0.541	0.503
N	3935	3935	3935	3935	3935

Note: *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively. Variables are as defined in Appendix A.

4.3 | Endogeneity analysis

4.3.1 | Propensity score matching (PSM) test

We generate an alternative sample using the Propensity Score Matching (PSM) test to address the endogeneity concern. We create the treatment and control groups by using the industry average of the independent variable, CG_index. The treatment group is formed by creating an indicator variable that takes a value of 1 for observations above the industry average, whereas the control group is created by assigning a value of 0 for the remainder of observations of the testing variables. Following this step, we use

TABLE 10 Testing for endogeneity using the Heckman two-stage estimation.

	First stage	Second stage				
	CG_dummy *Model 10.1*	Climate_commit *Model 10.2*	Climate_commit *Model 10.3*	Climate_commit *Model 10.4*	Climate_commit *Model 10.5*	Climate_commit *Model 10.6*
Culture		0.0545***				
		[2.72]				
SEC			−0.0545***			
			[−2.72]			
TYP				0.0535***		
				[2.72]		
LTO					−0.0005	
					[−0.01]	
MAS						−0.0002
						[−0.01]
LS		5.9062***	5.3612***	5.3612***	1.2428***	1.2514*
		[3.62]	[3.72]	[3.72]	[10.19]	[1.96]
CG_index		0.6836***	0.6836***	0.6836***	0.6836***	0.6836***
		[25.43]	[25.43]	[25.43]	[25.37]	[25.37]
SIZE	0.2668***	0.2867***	0.2867***	0.2867***	0.2851***	0.2851***
	[9.19]	[11.68]	[11.68]	[11.68]	[11.69]	[11.69]
LIQUID	−0.3356***	−0.0123	−0.0123	−0.0123	−0.0127	−0.0127
	[−7.61]	[−1.39]	[−1.39]	[−1.39]	[−1.43]	[−1.43]
R&D_exp	−0.3858***	0.0231	0.0231	0.0231	0.0227	0.0227
	[−17.99]	[1.30]	[1.30]	[1.30]	[1.28]	[1.28]
INTANG_intensity	0.5552**	−0.3893**	−0.3893**	−0.3893**	−0.3810**	−0.3810**
	[2.13]	[−2.20]	[−2.20]	[−2.20]	[−2.15]	[−2.15]
ROA	0.0577***	0.0041*	0.0041*	0.0041*	0.0040*	0.0040*
	[7.36]	[1.94]	[1.94]	[1.94]	[1.91]	[1.91]
CAP_intensity	1.6937*	1.2500**	1.2500**	1.2500**	1.2542**	1.2542**
	[1.74]	[2.52]	[2.52]	[2.52]	[2.53]	[2.53]
FCF	−1.2122*	0.1627	0.1627	0.1627	0.172	0.172
	[−1.81]	[0.70]	[0.70]	[0.70]	[0.74]	[0.74]
GDP_growth	−0.0139	−0.0385**	−0.0385**	−0.0385**	0.0061	0.0061
	[−0.65]	[−2.35]	[−2.35]	[−2.35]	[0.63]	[0.63]
MILLS		−0.1305	−0.1305	−0.1305	−0.0606	−0.0606
		[−0.35]	[−0.35]	[−0.35]	[−0.15]	[−0.15]
Country fixed effect	Included	Included	Included	Included	Included	Included
Industry fixed effect	Included	Included	Included	Included	Included	Included
Year fixed effect	Included	Included	Included	Included	Included	Included
Intercept	0.1795	−4.4313***	−7.8651***	−11.4624***	−8.2312***	−8.2424***
	[0.21]	[−3.08]	[−13.58]	[−8.25]	[−3.91]	[−14.26]
R-squared	0.274	0.674	0.674	0.674	0.674	0.674

Note: *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively. Variables are as defined in Appendix A.

the PSM approach to generate the new sample. Then, the baseline regression tests are re-run using the PSM sample, and we report the results in Table 9. The results are in line with baseline analysis results.

4.3.2 | Heckman two-step estimation

Finally, to minimize sample bias and correct sample-induced endogeneity, we use the Heckman (1979) two-step estimation. We created

an indicator variable for CG_index based on the cut-off value of the industry average. The first stage involves employing a probit model using the industry average CG dummy as the dependent variable. We use the estimated parameters to compute the Inverse Mills Ratio (*IMR*), which we then include as an additional independent variable in the second-stage estimation. Table 10 reports the coefficient estimates from the first- and second-stage regressions. The *IMR* is insignificant, establishing that sample selection bias is not present, and that the ordinal probit regression is appropriate (Al-Shaer & Zaman, 2019). The findings are qualitatively similar to our main findings and indicate support for our study's hypotheses on the association between country-level mechanism (culture and LS) and corporate governance and corporate commitment to climate change.

5 | CONCLUSION

This study aims to explore how distinct cultural contexts and LSs influence corporate commitment to climate change. It also examines the role that the corporate governance of a firm plays in shaping the corporate response to climate change, and whether effective corporate governance might moderate the relationship between country-level mechanisms (LS and culture) and environmental practices. We use a sample of companies from the United States, the UK, and China, over the period of 2013–2020 and with a total of 21,564 firm-year observations, and develop a unique measure for corporate climate change commitment by totaling five climate commitment components: Has the company initiated a climate change policy that outlines its intention to help reduce global emissions of GHGs? Is the company aware that climate change can represent commercial risks or opportunities? Does the company report CO_2 equivalent emissions indirect Scope 3? Has the company set an emissions reduction target year? Has the company tried to improve energy efficiency? With the country-level variables, we include the country's LS and national culture, respectively. We proxy LS by whether the firm is from a common law country or a code law country. We also use Hofstede dimensions to proxy the national culture.

Building on the institutional and legal origin theories, our results show that first, there are differences in corporate commitment to climate change between the United States, the UK, and China—the UK has the highest average score of corporate climate commitment. Second, we indicate that country-level mechanisms (culture and LS) are significantly and positively linked with corporate commitment to climate change, suggesting that the stronger the normative and coercive norms, the higher the corporate commitment to climate change. We find that companies located in less transparent societies are less likely to be committed to climate change. Companies located in socially oriented societies, or in societies that are long-term oriented, are more likely to be committed to climate change. However, the masculinity level in a society does not affect corporate commitment to climate change. Moreover, we find that firms in common law countries are more committed to climate change. Third, the strength of corporate governance enhances corporate commitment to climate change. Corporate governance can substitute or complement the effects of the culture and LS on climate change commitment. Overall, our regression models are robust to several types of endogeneities, in addition to alternative culture proxies and sensitivity analyses.

This study offers important implications for stakeholders, including policymakers and managers. It is crucial for policymakers to understand the role of the culture and LS on corporate commitment to climate change as they develop new environmental policies and regulations. When designing effective climate change regulations, policymakers should consider tailoring them based on cultural tendencies. Managers, particularly those of multinational companies, should recognize cultural and legal effects, incorporating them into their business models when adopting environmental strategies that enhance their commitments to climate change. The findings could be helpful for investors evaluating corporate commitment to climate change for long-term decision-making.

We believe that our study offers a new insight into how country-level mechanisms (national culture and LS) and corporate governance influence corporate commitment to climate change, and that there is immense opportunity for future research in this field. For example, future research could investigate the role of other macro level factors (such as the corruption level of a country using the Corruption Perceptions Index [CPI]) on climate change decisions. We focus on three nations in our sample—the UK, the United States, and China. Researchers may extend our sample and investigate how companies operating in other countries are adopting climate change policies and responding to climate risks. Our sample is based on firms listed on the FTSE all-share, NASDAQ all-share, and Shanghai stock exchange (SSE) that tend to be large in size. Further research may examine the impact of country-level factors and corporate governance in smaller firms in which the role of institutional norms could be different. Furthermore, we only use Hofstede's cultural measures; future research could explore the influence of culture using alternative cultural measures, such as Schwartz's human values (Schwartz et al., 2012). Finally, future research can explore the market consequences of corporate commitment to climate change, such as the effect of climate change commitment on firm value, performance, and cost of debt.

CONFLICTS OF INTEREST STATEMENT

No conflicts of interest.

DATA AVAILABILITY STATEMENT

Data are available from the authors upon reasonable request.

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APPENDIX A: VARIABLE DEFINITION

Climate_commit	**Corporate climate commitment index computed as a composite score by totaling the five climate commitment components: (i) an indicator variable takes a value of 1 if the company initiates a climate change policy that outlines its intention to help reduce global emissions of GHGs; (ii) climate change commercial risk opportunities: an indicator variable takes a value of 1 if the company is aware that climate change can represent commercial risks or opportunities, 0 otherwise; (iii) CO_2 equivalent emission indirect Scope 3: an indicator variable takes a value of 1 if the company discloses its Scope 3 emission, 0 otherwise; (iv) emission reduction target: an indicator variable takes a value of 1 if a firm sets target year on emission reduction, and 0 otherwise; (v) carbon credit trading: an indictor variable takes a value of 1 if a firm purchased or produced carbon credits and allowances during the fiscal year, and 0 otherwise; (vi) an indicator variable takes a value of 1 if the company has put efforts to improve energy efficiency and drive energy from cleaner fuel sources**
Internal governance factors	
SUSCOM	An indicator variable that equals 1 if a board level sustainability committee exists, and 0 otherwise
SUS_reporting	An indicator variable that equals 1 if a firm publishes sustainability reports, and 0 otherwise
EXT_assurance	An indicator variable that equals 1 if sustainability information is externally assured, 0 otherwise
SUS_incentive	An indicator variable that equals 1 if the company provides incentives for individual management of climate change and sustainability issues, and 0 otherwise
BODSIZE	Number of board members. When it is included in the CG index, we use an indicator variable that equals 1 if number of board members is higher than the industry median 1, otherwise 0
BODIND	Proportion of independent directors on the board. when it is included in the CG index, we use an indicator variable that equals 1 if the percentage of independent directors on board is higher than the industry median 1, otherwise 0
BODDIV	Proportion of female directors on the board. When it is included in the CG index, we use an indicator variable that equals 1 if the percentage of female directors on board is higher than the industry median 1, otherwise 0
CG_index	Internal corporate governance index computed as a composite score by totaling the seven internal governance components, that is, SUSCOM (0–1), SUS_reporting (0–1), EXT_assurance (0–1), SUS_incentive (0–1), BODSIZE (0–1), BODIND (0–1), and BODDIV (0–1). Hence, the composite score ranges from 0 to 7
Cultural dimensions	
Power distance (PD)	A numerical variable that represents the level of hierarchy within a society
Uncertainty avoidance (UA)	A numerical variable that identifies the level of uncertainty avoidance. A low uncertainty culture emphasizes a higher level of standardization
Individualism (IDV)	A numerical variable that reflects the prevalence of individual values compared with group values
Masculinity (MAS)	A numerical variable that represents the level of male orientation
Long-term orientation (LTO)	A numerical variable that represents the orientation of a society towards the future. It is related to Confucian or Chinese values
Indulgence (IND)	A numerical variable that expresses the extent to which a society is socialized.
Secrecy (SEC)	The level of secrecy in nations which is seen as being the opposite to transparency. SEC = UA + PD − IDV
Generic type of culture (TYP)	The operationalization of a level of social orientation of society. TYP = IDV − PD
Culture	A numerical variable indicative of the level of cultural system development measured as the mean value of long-term orientation and indulgence and the inverse of individualism, masculinity, and uncertainty avoidance and power distance
Legal system (LS)	A country's legal system, measured as a dummy variable equal to 1 for common law and 0 for code law countries
Control variables	
SIZE	Natural log of total assets
LIQUID	Liquidity measure calculated as the sum of accounts receivable and inventory to total assets
R&D_exp	The natural log of research and development expenditure
INTANG_intensity	Intangible asset intensity measured by total intangible divided by total assets
ROA	Return on assets measured by net income to total assets
CAP_intensity	Capital expenditure intensity measured by capital expenditure divided by total assets
FCF	Free cash flow measured by cash flow from operation divided by sales
GDP_growth	GDP growth of each country