Corporate Sexual Orientation Equality and Carbon Emission

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Abstract

Does a firm's tolerance and nurturing of its alternate sexual orientation employees influence its long-term sustainability? Using the corporate sexual orientation equality (CSOE) environment, we show that firms with higher CSOE ratings emit less greenhouse gas (GHG) thereby ensuring long-term sustainability. In addition, we report that the aforementioned CSOE-GHG relationship is stronger for firms with less agency issues (e.g., less powerful CEOs and more monitoring). Finally, we find that carbon emitting firms (CEFs) that invest in higher levels of CSOE initiatives are not doing it for external rewards (e.g., they suffer from lower firm valuation and face a higher cost of raising capital).

Keywords: workplace diversity; carbon risk; GHG emission; sexual orientation equality; LGBT rights; climate change.

JEL Codes: M14; Q51; Q53; Q54; Q56.

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Corporate Sexual Orientation Equality and Carbon Emission

"There is one issue that will define the contours of this century more dramatically than any other, and that is the urgent threat of a changing climate"

(Former U.S. President Barack H. Obama on climate change)

"The violence that exists in the human heart is also manifest in the symptoms of illness that we see in the Earth, the water, the air and in living things."

(Pope Francis)

1. Introduction

As a Muslim I believe that all souls are equal and should be given equal opportunity, regardless of their identity, which is why I my interest towards Corporate Sexual Orientation Equality increased and as someone from Bangladesh I have seen enough pollution to know how it can ruin the future generation, which is why I also researched Climate Change. As a masters student I kept inquiring about these two topic and ready many related papers which lead to me, writing this paper which combines the two important discussion in the 21st century, which is Carbon Emission and Corporate Sexual Orientation Equality.

In this study, I investigate whether corporate sexual orientation equality (*henceforth* CSOE) proxied by a firm's fairness towards, and equitable treatment of, its employees who profess an alternate sexual orientation, influences its carbon footprint proxied by greenhouse gas (GHG) emissions (commonly known as carbon emissions). This is one of the major issues

reflected in discussions in a variety of venues. Most stakeholders now recognize climate change and the resulting global warming as one of the most overwhelming challenges to face the planet and humanity. While many factors could potentially trigger climate change, there is a near total consensus among scientists that the main culprit is carbon emission.[1] As a result, various stakeholders such as policymakers and institutional investors are exerting mounting pressure on carbon-emitting firms (*henceforth* CEFs) to take action to reduce their carbon footprint.[2,3] Societal sensitivity to climate change and environmental issues come to prominence in times of disasters, as in the case of the carbon emission scandal Volkswagen perpetrated or the British Petroleum scandal involving the Deepwater Horizon oil spill. Still, these incidents expose the wide gap between the corporate rhetoric of being socially responsible and actual performance (Favotto and Kollman, 2015). Indeed, a growing body of literature has become available exposing this phenomenon (Kim and Yoon, 2021; Raghunandan and Rajgopal, 2021; Shapira and Zingales, 2017). Cho et al. (2006) characterize this sort of disingenuous activity "a significant lapse in ethical conduct" (p. 148).

I address an important research question in this paper. Identifying the factors that could potentially influence corporate carbon emissions is of immense importance. To reduce our carbon footprint, I need to know the channels through which I could achieve such a reduction.

[1] Based on the statistics provided by the Environmental Protection Agency (EPA) of the United States, three-fourth of GHG emissions come from carbon dioxide as we can see here (https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data).

[2] A recent study published by EY reports that a super majority (~75%) of institutional investors is looking to divest from companies with poor environmental track records (see: https://www.ey.com/en_ca/news/2021/11/three-quarters-of-institutional-investors-looking-to-divest-from-companies-with-poor-environmental-track-records)

[3] In a stunning move in 2021, activist investor Engine No. 1 (a hedge fund virtually unknown until then) successfully installed three directors on the board of Exxon. Their goal is to push the energy giant to reduce its worldwide carbon footprint (see: https://www.nytimes.com/2021/06/09/business/exxon-mobil-engine-no1-activist.html).

Recent literature on business ethics and financial economics suggests that pressure from various stakeholders, as well as other common factors such as governance and solvency, shapes the corporate carbon footprint (Akey and Appel, 2021; Azar et al., 2021; Naaraayanan et al., 2021; Shive and Forster, 2020). Among these groups of stakeholders, employees form one of the most important groups in a corporation. How a firm treats its employees tells a lot about that firm. Hence, we believe that CSOE represents an influential lens for examining corporate carbon emission.

To predict the relationship between CSOE and carbon emissions, I have taken a confident and forward-looking step to develop two streams of competing arguments anchored in theoretical frameworks presented in the business ethics, strategic management, and financial economics literature. Our argument for the first stream is based on *Stakeholder Theory* (Freeman, 1984; Harrison et al., 2010). Climate change poses both an opportunity and a cost to a firm. In other words, it becomes a strategic choice. It could threaten the immediate financial health of a firm but bear fruit in long-term sustainability. As climate awareness and subsequent stakeholder pressure increases, firms may have no way out other than to invest in carbon mitigating measures. Moreover, extant studies show that if CEFs fail to respond in a proactive and diligent manner to the pressures posed by society and regulatory bodies, they may face the risk of serious litigation and damage to their reputation with serious negative impact on future business and competitiveness (Chapple et al., 2013; Chen and Gao, 2012; Garvey et al., 2018; Herbohn et al.,

2019; In et al., 2017; Kim et al., 2015; Matsumura et al., 2014).[4] Firms pursuing uniform rights for their LGBT employees are those adhering to stakeholder orientation (Shan et al., 2017). Linking carbon emissions and the pursuit of equal rights for LGBT employees allows us to predict that CEFs that undertake LGBT-rights initiatives for their employees will have lower levels of carbon emissions. In sum, I expect a negative CSOE-GHG relationship.

Our second argument in support of the first stream is based on ethics and justice (Bond and Park, 1991; Chapman, 1975; Connolly et al., 1980; Htun and Weldon, 2015; Rawls, 1971; Sen, 1995). It is fair and just to treat all employees equally, irrespective of their skin-color, ethnicity, religion, gender, or sexual orientation. For CEFs, reducing their carbon footprint is the ethical and just thing to do. Therefore, CEFs that promote equal rights for their LGBT employees are more just and ethical in their behavior and will thus be more inclined to take measures to reduce GHG emission. In brief, I expect this to produce a negative CSOE-GHG relationship.

Our argument for the second stream is based on a transactional perspective. Implementing LGBT-supportive policies may lead to conflicts among different stakeholder groups. One group of shareholders who believes in justice and fairness and who are not fans of Milton Friedman's shareholder-only perspective may view them positively; others may view them negatively for moral or economic reasons. The latter group may interpret them as an 'agency cost.' There is evidence in the CSR literature that firms can use CSR investment to earn reputational equity (Barnea and Rubin, 2010; Cui et al., 2018). A contemporary study by Kyaw

[4] For instance, some studies show that CEFs pay a higher cost of debt (Herbohn et al., 2019). Others report that carbon emission is detrimental to firm value (Matsumura et al., 2014).

et al. (2021) provide substantiation that suggests managers tend to co-opt boards to pursue LGBT-friendly policies, and this in turn can result in an increase in their total compensation. From a purely transactional point-of-view, GHG emission reduction could prove costly for CEFs. Though the benefits may outweigh the costs in the long run, the near-term costs are high. Secondly, there is no guarantee that GHG-reducing initiatives will bear fruit, since various external factors may negatively influence the potential of a positive outcome in the long run. If a CEF is undertaking LGBT-friendly policies for transactional benefits, does not ensure that they will also take steps to reduce GHG emissions. According to the CSR literature, such actions will generate a *warm-glow-effect* for themselves (Barnea and Rubin, 2010; Cui et al., 2018) and they can use that to fend off any negative reputational equity arising from higher GHG emissions. In other words, I can expect this to produce a positive CSOE-GHG relationship.

In summary, I cannot reach a predisposed conclusion regarding the relation between CSOE and GHG. Therefore, I present it as an empirical question. I make a diligent attempt to empirically observe the relationship between CSOE and GHG using samples of U.S. CEFs that are publicly listed.

Arguably, I observe that CEFs with a higher level of CSOE ratings emit lower levels of GHG. This finding is consistent with predictions arising from our first stream of arguments based on stakeholder theory and business ethics. It is appropriate for us to mention that our results are not susceptible to the use of alternate regression models, or to alternative definitions of our main variables, or to potential endogeneity issues (notably it survives a difference-in-difference analysis using a quasi-natural experiment.

Our study adds to business ethics literature in multiple ways. A growing number of studies has been examining some of the issues that could potentially influence corporate ethical behavior and environmental footprint (Fisher-Vanden and Thorburn, 2011; Haigh and Griffiths, 2009; Hoffman, 2006; Homroy and Slechten, 2019; Okereke, 2007; Rao and Tilt, 2016; Walls et al., 2012). Specifically, the study contributes to the rapidly increasing literature on GHG emissions and climate risk, a relatively recent phenomenon for many countries. Previous studies have convincingly demonstrated that strict regulations, ownership structure (e.g., external monitoring by institutional investors), activist investors seeking GHG emission reduction, a firm's limited liability, and financial constraints all play a critical role in curbing a firm's carbon emissions (Akey and Appel, 2021; Azar et al., 2021; Homroy and Slechten, 2019; Okereke and Russel, 2010; Shive and Forster, 2020). Our study documents that a firm's employee policy (i.e., LGBT-employee friendly initiatives) can significantly impact GHG emissions. To the best of our knowledge, our study is the first of its kind to take this distinctive approach.

Our study also adds to the emerging literature on the corporate provision of equal rights for employees with an alternate sexual orientation. Contemporary studies have shown that firms that are friendly to all their employees including those with alternate sexual orientations enjoy greater benefits in some of the areas corporations look for in employees, such as improved performance, greater employee productivity, enhanced quality of produced goods, greater employee satisfaction, and the potential to attract and retain better talent (Cordes, 2012; Hossain et al., 2020; Metcalf and Rolfe, 2011; Ragins et al., 2007; Ragins and Cornwell, 2001; Shan et al., 2017). Our study, therefore, expands that body of literature, demonstrating that CEFs with a higher level of LGBT-employee rights can induce responsible environmental policy through reduced GHG releases.

As you progress further into the paper you will first see Section 2 Literature and hypothesis development section, where I explain further about the two research topics CSOE and carbon emission and theories that will further support these topics. After that I move on to the next section 3 where I discuss my sample, research design and some other variables. In section 4 I move on discussing my Findings in detail. In section 5, The firms strategic and ethical reasons are discussed further regarding carbon emission and CSOE and finally the last section with conclusion.

2. Literature Review and Hypothesis Development

2.1 Background on Corporate Sexual Orientation Equality

This study uses the acronym CSOE, a short form for Corporate Sexual Orientation Equality, to indicate the set of initiatives corporations have taken to ensure equal rights for all LGBT employees. The impetus for such initiatives comes in part from a world-wide movement to improve such rights. Zeid Ra'ad Al Hussein, the former UN High Commissioner for Human Rights, for example, emphasized the significance of paying close attention to LGBT rights when he said in a speech in 2017: "If we are to achieve faster global progress towards equality for lesbian, gay, bi, trans, and intersex people, businesses will not only have to meet their human rights responsibilities, they must become active agents of change." Ensuring the human rights of LGBT employees is a particular form of action corporations can take but doing so brings with it a host of ramifications.

LGBT rights form a major humanitarian component of corporate behavior component today, but for years the U.S. has witnessed several social movements forcing society in general,

and corporations, to pay closer attention to members of underprivileged groups. The early part of the twentieth century witnessed the Suffrage movement for women's voting rights. During the 1950s the Civil Rights movement gradually established equal rights for African Americans and the early 2000s saw the rise of the #MeToo movement calling for establishing rights for sexual abuse victims and insisting on justice for them. The LGBT movement remained until recently mostly underground, and a taboo subject for discussion, despite annual Gay Pride parades, and public acknowledgement by international entities such as the Vatican. The first U.S. federal acknowledgment of LGBT rights came from the Defense Department in the form of the "Don't-Ask Don't-Tell" initiative [1993] that allowed members of the LGBT community to serve in the military.[5] But the culmination of this movement towards full acceptance came 22 years later, on June 26th of 2015, when the Supreme Court of the United States (SCOTUS), in a landmark ruling (*Obergefell v. Hodges*; Docket no. 14-556) declared that members of the LGBT community were equally protected and had full equal rights with other citizens of the U.S.

One central issue in published research on this topic raises concerns about the proxy used for LGBT rights. Many studies (e.g., Chintrakarn et al., 2020) simply use a binary variable obtained from the MSCI KLD database.[6] This proxy equals one if the firm is LGBT friendly and zero if it is not. I are convinced that using a binary variable does not capture the complexity involved sufficiently. If a firm adopts a few LGBT-friendly policies, it will receive a score of one, while ignoring other policies important to LGBT employees.[7] As a result of this limitation,

[5] Defense Directive 1304.26, issued by the Clinton administration on December 21, 1993.
[6] MSCI purchased KLD Research & Analytics in 2009 and RiskMetrics in 2010.
[7] Another issue with the KLD measure is that the database stopped covering the variable in 2011, whereas the LGBT-movement started to reach peak in the 2010s and 2020s. In other words, data is dated at best. However, it should be mentioned that our findings are not sensitive to the use of this KLD measure of 'gay rights'.

many recent studies have been using the more comprehensive measure provided by the Human Rights Campaign (HRC). The HRC annually reports a Corporate Equality Index (CEI) ranging from 0 to 100, where a score of 100 means the company has met all possible LGBT-rights measures. Each year, the HRC sends their questionnaire to S&P 500 companies, Fortune 500 companies with at least 500 employees, and to private companies listed on the Forbes 200 list. In this study I focus only on the public firms. For the sake of transparency, it should noted that feedback on the questionnaire is voluntary, and some firms may choose not to reply. In general, the HRC rating encompasses four broad areas:

1. Workforce protections (maximum 30 points). This includes policies favorable to employees from all types of sexual orientation and gender identity.

2. Inclusive benefits (maximum of 30 points). Among other things, this measure includes all benefits provided equally to heterosexual and LGBT employees.

3. Supporting an inclusive culture (maximum of 40 points). This score covers a broader spectrum of issues, such as creating an LGBT-friendly work environment through sensitivity training, creating support groups for LGBT employees taking initiatives to hire LGBT workers and implementing LGBT-friendly policies that expand to all stakeholders, to name just a few.

4. Responsible citizenship (deductions 25 points). Corporations receive a deduction worth 25 points for each major violation of LGBT rights.

The CEI are publicly available on the HRC website. Recently, researchers have used these scores in a variety of studies (Cook and Glass, 2016; Hossain et al., 2020; Nadarajah et al., 2021; Shan

et al., 2017; Zhu and Smieliauskas, 2021) rather than the simple binary proxy score taken from the MSCI KLD database.

2.2 Diversity

Gender diversity in the workplace means an equal ratio of men, women, and other gender identities, regardless of their origin of country, religion, or culture, working together in a company. For a company to have a productive working environment, requires an equal ratio of men, women, and other genders (regardless of their origin of country, religion, or culture). Diversity signifies that companies hire employees at a balanced rate; they are equally paid and appreciated, regardless of their identity/background. In a workplace, all employees should be free to express themselves. All of this is present in an ideal situation, but the scenario differs from one workplace to another.

In most cases, I talk about the importance of diversity, but find it difficult to implement. Unfortunately, there is always a gap between what should be done and what really happens. This paper primarily discusses the importance of diversity and how a leader who actively encourages inclusivity can help with the development and maintenance of diversity. A substantial diversity and an inclusive leadership strategy can help organizations gain top talent, leading to innovative outcomes. Companies should move towards diversity and inclusive leadership in the workplace. Aside from simply being the right thing to do, executives should realize the benefits of a diverse workplace and know that it forms part of improving the employee experience.

A diverse workforce with a mixture of age, race, religion, nationality, sexual orientation, and gender identity, brings new viewpoints and perspectives to the company (Bernile et al., 2018).

Among other things, these elements can help a company develop products and new ways to cater to customers. A diverse workforce means the ability to manage a diverse group of customers as well. The benefits of workplace diversity can include increased revenue, innovation, higher quality decision making through diverse perspectives (regardless of their identity and background), and better performance than competitors who are still unwilling to accept diversity and thus rejecting a wider pool of talent. But if a company is unable to nurture this talent and utilize it, there seems little point in gathering all this talent. To remedy this, a leader who supports inclusivity is essential to embrace new policies, take initiatives, and create tools designed to increase the level of diversity among employees and present opportunities for them to showcase their talent.

Diversity in the workplace is also a different matter from having a leader who supports inclusivity. While diversity means creating a workforce with variety, inclusion means creating a working environment where the employees feel safe and can express themselves and their opinions/perspectives freely with everyone. If a company only creates diversity by hiring people from different religions but do not make them feel included and free to express their diverse nature, then that company will appear look diverse without being able to reap the benefits. Therefore, it is important not only to have a diverse workforce, but also to train or hire an inclusive leader who can bring out the inner talents of employees for the company to reap the benefits. Examples can be multiplied: the employee who is a native Spanish or Hindi speaker but feels comfortable only in English in common workspace areas; or a breastfeeding mother who has just returned to work after maternity leave and has no private space to pump her breast milk; or a Muslim employee who feels insecure about maintaining daily prayer routine on company grounds. Establishing diversity in a company is only the first step. But if employees do not feel

comfortable in a workplace, they will not fully utilize their talent, and the company will possess diversity in name only, without reaping the benefits.

Diversity refers to both a common fact of human life, namely, that there are different kinds of people in the world, and the idea that diversity can drive cultural, economic, and social vitality and innovation. Some research (Barak et al., 2003) suggests that intolerance hurts our personal and social well-being, and that individuals can only thrive when they have tolerance and embrace the diversity of the world and the people living in it. In North America, the word “diversity” would seem to be most often associated with racial diversity. However, that is just one dimension of human reality. We also differ in gender, language, manners, and numerous other ways. To understand diversity in the workplace, we must think about all the distinctive characteristics that employees could have. For instance, we all have the basic characteristics protected in law, such as race, age, gender, and sexual orientation. We also have some other characteristics that we should consider when hiring someone, regardless of their background: individuals possess a variety of experiences, talents, skills, opinions, and personalities. These sorts of differences are less obvious and require an organization to expend effort and be proactive for such employees to shine. Creating a company that is diverse means that no one should discriminate against protected characteristics, and an employer should provide equal opportunities for all. This will help build up the employer's brand and keep employees satisfied and productive (Sania et a 2015).

2.3 Organizational Business Ethics and Carbon Emission

In the wake of growing apprehension about the global climate crisis (Cho et al., 2006; Newton, 2005), the responsibility of firms in the management of the natural and genuine environment has been a crucial and central issue in business ethics in academic literature going back in some sense as far as Aristotle. He argues in his *Nicomachean Ethics* that ethics, as much as decisions are concerned, plays a basic and essential responsibility in civilized society. He maintained that ethics is not an isolated philosophical or ethical phenomenon but applies to all views and attempts to locate the 'good' in an individual and society where she or he resides as a being (Crisp, 2014). Solomon (2004) notes that the "Aristotelian approach to business ethics … begins with the idea that it is individual virtue and integrity that count, and that good corporate and social policy encourage and nourish individual virtue and integrity" (p. 1021). Solomon rightly claims that because corporations consist of people, the kind of ethics these people practice will define the ethical practice of a corporation. However, the literature is not unified as to the benefits of those ethical practices and actions even though the view maintained by Aristotle relies primarily on morality in decision making. To understand this notion better, morality is reasonably considered a guiding parameter enabling a person to differentiate between good or bad, or right or wrong (Besio and Pronzini, 2014, p. 289). Therefore, the ethical standards and practice of the management of corporations will determine the actions taken, and policies established, to mitigate climate change, which is now a serious global problem created by the colossal amounts of GHG that have entered our atmosphere. Arguably, it started in the late eighteenth century, the start of the Industrial Revolution (see Beck, 2009). I argue therefore that the solution to climate change does not rest on a specific entity's shoulder; rather, it depends

on the collective action and behavior of corporations, and of people in society (see Northcott and Aid, 2007). Researchers became cognizant of, and gradually received recognition from society and from around the globe, that climate change is a phenomenon that requires attention from corporations, and especially from their top management, not just individuals (Haigh and Griffiths, 2009; Härtel and Pearman, 2010; Winn et al., 2011).

Previous literature on GHG emissions that depends on the Aristotelian view have reported that reducing the carbon footprint comes with its perks and have demonstrated that lowering carbon emissions comes with a discount in credit markets in the form of a lower cost of debt (Jung et al., 2018). These investigators further argue that investors consider the threat of carbon risk seriously and opine that it will pose a risk in the future recognizing the shift in investor attitudes in the new millennium. For example, Herbohn et al. (2019) report similar findings for bank loans and Besio and Pronzini (2014) as well as Herbohn et al. (2019) demonstrate in their studies under the 'Win-Win' philosophy that investments in new technology and the inclusion of environmental ethics in corporate governance procedures to mandate reducing carbon emissions help corporate profitability (Crane et al., 2008; Eberlein and Matten, 2009; Hoffman, 2005; Kolk and Levy, 2001). Other studies have also pointed to the significance of corporate disclosure of carbon risk (Jung et al., 2018; Li, 2018).

A very recent growing body of literature identifies the gap between a company's commitment to climate crisis and its environmental disclosure (Kim and Yoon, 2021; Raghunandan and Rajgopal, 2021; Shapira and Zingales, 2017). Shapira and Zingales (2017) demonstrate how DuPont considered the irresponsible and intentional disposal of toxic chemicals as an optimal decision despite the likelihood of detection. Raghunandan and Rajgopal (2021), a

study relevant to our investigation, surprisingly document a higher level of GHG emissions by publicly listed signatories of the 2019 Business Roundtable (BRT) *Statement on the Purpose of a Corporation*. This is unfortunate because these firms more likely appear to be compliant when seen from the outside but behave in an entirely self-interested manner on the inside. In the issue of environmental disclosure, other studies show that extensive positive environmental disclosures are often found in companies with poorer environmental performance as they try to influence their status in the court of public opinion (Cho and Patten, 2007; Kolk and Pinkse, 2007; Levy and Egan, 2003; MacKay and Munro, 2012;). To them, environmental disclosure is a strategic weapon and not a real avenue to fight climate change.

Essentially, the literature examining the ethical responses of companies towards environmental performance demonstrate that such an ambivalent attitude is not unique. Why some companies appear to be more committed to this cause than others is thus a crucial question. Our study maintains that the dissimilar responses towards environmental performance depend primarily on the interplay between a company's ethical standards and how it treats its employees, especially when these are at variance with each other.

2.4 Pro-stakeholder Philosophy and Corporate Sexual Orientation Equality

The corporate world has come a long way from Milton Friedman's shareholder-only perspective to a position based more on stakeholder interests, a group that includes workers, suppliers, customers, and creditors (Freeman, 1984; Freeman et al., 2008; Harrison et al., 2010; Parmar et al., 2010). The stakeholder point of view Freeman and others are following insists on including and representing all stakeholders and their interests because they contribute equally to

the success of a firm as do shareholders (Baker and Anderson, 2010). Moreover, employees constitute an integral part of any organization, and form one of the single most important groups to make crucial and significant contributions to a firm's success. It is thus essential to treat them fairly and equitably. As society gradually moves toward more tolerance for alternate sexual orientations, treating LGBT communities equitably has become more acceptable, to the extent that such initiatives now form part of many corporate CSR initiatives (Colgan, 2011; Snider et al., 2003). From a stakeholder perspective, firms providing LGBT-supportive workplace policies deliver a signal to potential employees, investors, and the market that the firm is committed to diversity and equality (Pichler et al., 2018; Theodorakopoulos and Budhwar, 2015).[8]

Treating LGBT employees equitably is not only the right thing to do, but it also provides benefits for corporations as well. Recent studies make clear that LGBT-friendly firms experience qualitative attributes like better performance, employee productivity, employee satisfaction, and, not surprisingly, an enhanced quality of goods produced (Hossain et al., 2020; Ragins and Cornwell, 2001; Ragins et al., 2007; Shan et al., 2017). Moreover, the implementation of LGBT-friendly policies will enhance a firm's ability to recruit and retain a talented workforce (Clermont, 2006; Cordes, 2012; Metcalf and Rolfe, 2011). Thus, considered from a strategic and ethical point of view, this is not only the right path for a corporation to pursue, but also the right thing for improving firm value for shareholders.

[8] *Theory of Justice* (Rawls 1971) reminds us that it is fair and equitable to treat all employees fairly regardless of their sexual orientation, since treating LGBT employees equally can be interpreted as 'basic fairness'. In the same way, tolerance of alternate sexual orientation can be linked to Adams (1963)'s *Equity Theory*. Fair treatment of LGBT employees can improve a firm's productivity and profitability, eventual objectives of the corporations.

2.5 Climate Change

No one can know how climate change will change the planet, but one thing is certain: it will directly and indirectly affect businesses around the world. Until recently, companies/corporations have freely emitted carbon emissions, but due to recent changes and developments they are beginning to realize and acknowledge that the emissions have a steep price, both monetary and social. Businesses that continue to ignore climate damage will face serious disadvantages compared to the ones that are now devising strategies to reduce climate damage risk and will hence find competitive advantages in a carbon constrained world. (Linnenluecke et al, 2013: Amran et al, 2016: Boiral et al 2012). Climate change is now playing a significant role in business competition. The public will increasingly criticize emissions of greenhouse gases and carbon dioxide, and governments have begun using pricing and regulations for environmental protection. While individual managers can disagree and continue to run companies with high emissions, the immediate impact of climate change will harm those companies that do not take appropriate actions. (Delmas et al 2015)

Soon we can expect to witness sea levels rise, as well as severe droughts, storms, and floods – indeed, in some parts of the world this has already become a reality (Van Aalst et al, 2006). These events will become a security concern for societies in general, and for businesses. Companies mainly care about profit since they are responsible to investors above all; as a result, they might do the bare minimum to stay under the radar from governments and avoid regulation. Companies could mainly concern themselves with their shareholders, stakeholders and certain rules and regulations set by the government to operate the company rather than with the entire issue of climate change.

To decide how a firm should approach climate change and develop a strategy to tackle it, business leaders need to have a detailed analysis of the firm itself to understand how it is impacting the climate and also conduct research on the benefits that the firm will receive if they help preserve the climate either by reducing their own emissions or participating in some activities to reduce emission even if those activities force to look outside their own firm. The emission impact from a firm can be direct or indirect. Emissions can be created by activities under the company's direct control or caused by the company through the activities of suppliers that themselves affect the climate, or other channels and customers which are indirect but whose affiliation becomes a firm' responsibility to reduce its emissions. A firm needs to realize that whether harmful emissions are caused by the firm itself or by their business partners and affiliates: both types are important targets for reduction as they are harming the climate. In other words, everyone must assume a share of the responsibility for reducing harmful emissions, whether direct or indirect. Reducing emission can help the firm increase firm value. (Hart et al, 1996; Nishitani et al 2012)

We know that extreme weather can destroy successful business environments and even societies. The long, monstrous war in Darfur (started in February 2003) in one sense represents a case of genocide caused by a struggle for scarce partly caused by the sorts of events that accompany climate change. Imagine what would happen when a flood-prone country like Bangladesh experiences increasingly severe monsoons and can do nothing but submerge under the sea: more than one hundred million people would have to relocate to seek shelter in neighboring countries like India or China, causing massive social and economic disruption. It would not take much to imagine the result if a drought devastated southern China which in turn radically reduced the flow of the Mekong River, that provides water to six Asian countries. The conflicts that could

arise around access to water—for irrigation, for households, for the industry—could disrupt this region's fast-growing economies.

Companies need to predict ways that climate change can directly affect their business. This could take the form if supply-chain breakdowns, employee migrations, increases in disease, or even an impact on reputation. Multinational corporations would be blamed for certain climate-related environmental problems. Firms need to evaluate their risks more broadly, researching whether the environments they operate in are vulnerable to catastrophic, climate-related disruption. To accomplish this, they need to assess systematically the vulnerability of the environments they operate in for floods, droughts, and storms. The most vulnerable will be areas where, for instance, when a country has limited capacity to act, the local ecosystem is delicate, agriculture is accelerating with few services, and the water supply is already stretched.

The human, environmental, and economic costs of climate change are becoming increasingly clear, as is the need for action. From disastrous floods to hurricanes, droughts, and fires, the consequences of climate change are no longer something we can leave alone for the future but represent a reality that we are facing in the present. Many scientists believe, and most governments around the world agree, that the increase in global temperatures must be held to under two degrees Celsius to avoid disastrous climate change. Industry action is extremely important to help meet this important goal and stop the damage to the climate. Investors possess an important role in the companies they finance and the future that their investments can create. They can invest in new products, technologies, and operational innovations and motivate other companies to do the same. The reason investors need to be aware of climate change is that they and the companies they invest in may face severe losses if unprepared for a quickly

decarbonizing global economy. If the global market moves towards decarburization and yet remains the same, they will be left behind and suffer major losses. Climate change presents a material risk for shareholders. The damage will be felt directly and indirectly in investor portfolios. As the physical damage of heat, drought, fire, floods, and pests overwhelm the nations, the costs to the economy will increase exponentially (Gobler et al., 2020).

2.6 Hypothesis

Our survey of the existing literature on CSOE reveals that ensuring equal rights for LGBT employees is beneficial to corporations. Thus, from a strategic management point-of-view, this is the right thing to do and from an ethical standpoint, fairness and justice to all employees is the right thing to do as well. It does not seem far-fetched, therefore, to claim that firms that take concrete steps to ensure equal rights for their LGBT-employees are more stakeholder-oriented in their stand on fairness and justice. But it is not clear how the implementation of CSOE affects the GHG emissions of a firm. Unquestionably reducing GHG emissions is the right thing to do because climate change and global warming are the most serious issues of this century. Former U.N. Secretary General Ban Ki-Moon once noted: "We are the first generation to be able to end poverty, and the last generation that can take steps to avoid the worst impacts of climate change. Future generations will judge us harshly if we fail to uphold our moral and historical responsibilities."[9] Furthermore, the literature shows that GHG emission is not beneficial for a firm's long-term sustainability (Chapple et al., 2013; Chen and Gao, 2012; Garvey et al., 2018; Herbohn et al., 2019; Hossain et al., 2022; Jung et. al., 2018; Kim et al.,

[9] In a plenary address to the 45th Annual World Economic Forum in Davos, on January 23, 2015.

2015; Matsumura et al., 2014). It is therefore not at all egregious to conjecture that CEFs with higher CSOE ratings will work toward reducing their GHG emissions. I call this the ***stakeholder perspective conjecture***. (A conclusion made based on the stakeholder theory that if a firm decides to support CSOE, they are more stakeholder-oriented in their stand on fairness and justice, and therefore reducing GHG emissions is the right thing to do because climate change and global warming are the most serious issues of this century)

The relation between CSOE and GHG emission can also be approached from an agency and/or transactional perspective. There is evidence in favor of the agency perspective. Studies have shown that managers tend to co-opt boards for pursuing LGBT-friendly policies, and this can result in an increase in their total compensation (see e.g., Kyaw et al., 2021). One could also argue using the *warm-glow-effect* phenomenon described in the CSR literature (see e.g., Barnea and Rubin, 2010; Cui et al., 2018) that CEFs are taking these initiatives to earn reputation equity and they will in turn use this to dilute negative perceptions deriving from their carbon footprint. From the transactional perspective, providing benefits to LGBT-employees does not come without cost. Some groups of shareholders may not support such measures because of associated cost. To appease these shareholders, therefore, CEFs with a higher level of CSOE initiatives may decide not to spend money on GHG-reducing initiatives, on the assumption that there is no guarantee that GHG-reducing initiatives will provide a net benefit to the firm in future. In sum, I predict a negative relation between CSOE ratings and GHG emissions. I call it the ***agency perspective conjecture***. (a conclusion made based on the agency/transaction theory that there is a negative relation between CSOE and GHG due to cost, as mentioned above)

To sum up the preceding discussion, the business ethics and stakeholder perspectives predict a negative CSOE-GHG relationship, and the agency and transactional perspectives predict a positive CSOE-GHG relationship. Hence, I can resolve the specific nature of the relationship between corporate sexual orientation equality and carbon emissions empirically. I can state my null hypothesis as follows:

> ***H1:*** *The absence of of a relationship between corporate sexual orientation equality (i.e., initiatives taken to ensure fairness and equality to their LGBT employees) and (GHG) emission level of that firm being tested.*

3. Research Design, Sample Construct and Key Variables.

3.1 Sample Construct

I have extracted data for the current research from multiple sources to reach our final sample of 1,736 firm-year observations from 260 unique carbon emission reporting firms during 2003-2019 and have obtained firm-level carbon emission (Scope 1 & Scope 2) data from the Thomson Reuters ASSET4 ESG database. Recent researchers have used this dataset extensively (Capasso et al., 2020; Dyck et al., 2019; Safiullah et al., 2021). The HRC survey (for CSOE rating scores) includes S&P 500, Forbes's 200 largest private firms, and Fortune 500 firms with at least 500 employees. In keeping with previous studies (Hossain et al., 2020; Shan et al., 2017), I therefore focus on the publicly listed firms only. I have collected data for firm-level control variables from COMPUSTAT North America and obtained data for demographic controls from the U.S. Census Bureau and the U.S. Bureau of Economic Analysis. Table 1 provides an

industry-by-industry sample distribution and summary statistics for our main dependent and research variables.

3.2 Empirical Model and Variable Construct

To demonstrate the relationship between corporate sexual orientation equality and carbon emissions that I predicted, our assessment led to the multivariate ordinary least squares model as below:

$$\textbf{\textit{Carbon Emission}}_{i,t} = \alpha \square\square\square \boldsymbol{\beta}\textbf{\textit{*CEI Rating}}_{i,t} + \gamma * Controls_{i,t} + Industry\ FE + Year\ FE + e_{i,t} \quad [1]$$

In this model, the dependent variable is *Carbon Emission*. I use total carbon emissions (Scope 1 + Scope 2) as our proxy for carbon emissions. Scope 1 represents a firm's direct carbon footprint while Scope 2 posits its indirect carbon footprint. However, the firm is responsible for both and hence it seems proper to include both in the analysis (see Safiullah et al., 2021). I scale total carbon emission tonnage by total assets to calculate our measure for *Carbon Emission* (Ilhan et al., 2021; Safiullah et al., 2021). Our main research variable is the *CEI Rating*; I have reported the details in Section 2.2.

Following some recent studies (Capasso et al., 2020), I use a range of firm and state-level attributes in our regression analyses. Studies of this issue, suggest it is reasonable for us to assume that bigger firms will reveal a higher carbon footmark. Moreover, firms with more leverage power and influence on industry may not have the flexibility to spend money on greener technology or carbon footprint reducing measures. On the other hand, firms with growth

potential may be much more careful and vigilant about their carbon emission footprint because they would prefer an untainted reputation in the market specifically with their clientele, including millennials, who are sensitive about the issues of global warming and carbon emissions. Therefore, it seems reasonable to conclude that a firm with a satisfactory performance record, few or no financial constraints, or fewer volatile returns will likely take positive initiatives to reduce its carbon emission. Because of these potential firm-level variations and characteristics, I control for the following elements: the natural log of total assets denoting *Firm Size*; financial leverage calculated as total debt scaled by total assets (*Leverage*); Tobin's Q (*Tobin's Q*); the return on assets (*ROA*); property, plant and equipment scaled by total assets (*Tangibility*); capital expenditure scaled by total assets (*Capex*); R&D expense scaled by total assets (*R&D*); standard deviation of return-of-assets over the past three years (*ROAVOL*); and the financing constraint score derived from Kaplan and Zingales (1997) (*KZ Score*). Additionally, I control some state-level characteristics, since the external environment of companies often shapes their ideology (Dowling and Pfeffer, 1975; Selznick, 1957, 1996). For example, I use a state's population density, calculated as the number of people living in that state for a given year divided by the state area in square miles (*Population Density*); the natural log of GDP per capita (*Local Income*); and attainment of a high school leaving certificate (*Education*). To address concerns related to variations across industries and over time, I control for industry (Fama-French 49) and year-fixed effects. Appendix A lists and describes all variables and measurements.

4. Empirical Findings and Discussion

4.1 Summary Statistics of Main Variables

Table 2 shows summary statistics of the variables used in our specification. In our sample, an average firm produces 8.75 million tons of greenhouse gas emission annually. The mean (median) values of *CEI Rating* are 0.76 (0.90) which is 76 (90) when I de-decimalize them. This is higher than in Hossain et al. (2020) [Sample period: 2011-2014], but comparable to Brodmann et al. (2021) [Sample period: 2003-2017]. In our sample, almost 40% of the firm-year observations obtain a perfect *CEI Rating* score which is comparable to Hossain et al. (2020). These firms are examples of equitable workplaces for LGBT employees. This table demonstrates that the average firm in our sample is comparatively large (market value of $48.6 billion) and profitable (ROA=15%), holds a reduced amount of leverage (leverage=28%), and enjoys growth potential (Tobin's Q=1.94). I have nothing unusual or remarkable in demographic controls.

4.2 Main Results: Carbon Emission and CSOE effects

4.2.1 Pearson Correlations

I present Pearson correlations between variables used in the main specification (Eq. [1]) in Table 3. Analytically, the negative (ρ=-0.21) and statistically significant correlation (at p<0.01) between *Carbon Emission* and *CEI Rating* provides preliminary support for our ***stakeholder perspective conjecture,*** i.e., CEFs with higher CSOE ratings will be responsible for lower level of GHG emission. As expected, the correlation between *Carbon Emission* and other controls appears to be consistent. For example, *Carbon Emission* is higher for larger firms

(ρ=0.05; at p<0.10) with more tangible assets (ρ=0.52; at p<0.01) and more leverage (ρ=0.15; at p<0.01); however, *Carbon Emission* is lower for those that are outperforming (ROA: ρ=-0.17; at p<0.01) and invest more in R&D (R&D: ρ=-0.25; at p<0.01).[10] To isolate the role of our primary variables more effectively, results collectively suggest a need to include these controls in our regression models.

4.2.2 Univariate Results of Mean Differences

Table 4 reports the univariate test of differences in the means of variables between high (above median) and low (below median) *CEI Rating* groups. For example, firm-level *Carbon Emission* is significantly lower (p<0.01) for firms that are more LGBT friendly (*High CEI Rating*) compared to counterparts that are less LBGT friendly (*Low CEI Rating*). Though not tabulated, the difference in raw carbon emission is a surprising 8.5 million metric tons. These results support our ***stakeholder perspective conjecture*** that *CEI Rating* relates negatively to *Carbon Emission*. Additionally, firms associated with *High CEI Rating* possess more growth potential but less tangible assets, and invest less in capital intensive projects and more in R&D.

4.2.3 Baseline Regression Results

Table 5 presents our baseline regression results, estimated using Eq. [1]. In all three models, *Carbon Emission* is our dependent variable, while *CEI Rating* is our main research variable. I have also included an array of control variables as discussed in Section 3.2 (last para).

[10] To alleviate our concern of multicollinearity, we check the variance inflation factor (*VIF*) of the variables included in the analysis. Our analysis shows the highest VIF is 2.99 for *ROA*, followed by 2.78 for *Tangibility*. The average is 1.77 suggesting that multicollinearity is not a concern for our analysis.

Based on our initial findings in Section 4.2.1 and 4.2.2, I anticipate a negative coefficient for *CEI Rating*.

Column (1) presents the OLS estimations from our main specification. The strong negative relation between *CEI Rating* and *Carbon Emission* (coefficient = -10.4251, $p<0.01$), suggests that CEFs that are more diligent in ensuring equal rights for LGBT employees show a relatively lower level of GHG emissions. Column (2) reports results from a more restricted specification, from which I removed the demographic controls. This improves the magnitude of the coefficient for *CEI Rating* slightly but the R-square value remains almost the same to three decimal places. This demonstrates that demographic controls have little or no effect on the strength of our specification. More importantly, the relationship between *CEI Rating* and *Carbon Emission* is still negative and significant (coefficient = -13.1086, $p<0.01$). This result confirms my earlier findings. Finally, Column (3) presents what happens when I withdraw all firm and demographic controls. Unsurprisingly, the negative relationship between *CEI Rating* and *Carbon Emission* remains unchanged (coefficient = -16.2282, $p<0.01$). The results presented in this table clearly support our ***stakeholder perspective conjecture,*** that CEFs with higher CSOE ratings will be responsible for a lower level of GHG emissions.

These findings also have an economic consequence, as we can see from the coefficient in Column (1), suggesting that an interquartile increase in *CEI Rating* (1.00-0.60=0.40) is related to a decrease in *Carbon Emission* equivalent to 18.9% of an average firm's emission level (calculated as (0.40*(-10.4251))/22.07) =0.189), equivalent to a reduction of 1.65 million tons in emissions. Although the U.S. as a nation does not use any federally mandated carbon pricing, some U.S. states do. Moreover, internationally, many countries now use carbon pricing, a group

that includes Canada, our neighbor to the north. Data obtained from the World Bank[11] shows that the price per ton of carbon emissions stands at USD 17.94 in California, and USD 31.83 in Canada; potentially we could argue that a decrease in carbon emission tonnage could eventually translate into savings of between USD 29.6 million and USD 52.5 million.

To summarize, CEFs that are more active in providing equal rights to all employees including those with minority sexual orientation appear to be more likely for firms with lower carbon emissions. Reducing carbon emissions might be costly because it could potentially require investing in green technology and/or divesting from sectors that produce a larger carbon footprint—each of which could potentially deplete future cash flows and profitability. In other words, at least in the short term, it would likely be financially non-beneficial. Despite these potential negative impacts, CEFs with a higher level of CSOE are taking steps to reduce their carbon footprint. This indicates more of a stakeholder-oriented vision than a focus on short-term profitability.

4.2.4 Robustness Tests

A reader could argue that my results may be susceptible to model specification. In keeping with current literature, therefore, I have adopted various alternate estimation methods to control cross-sectional and serial dependence (Attig et al., 2014; Benlemlih and Bitar, 2018; Gow et al., 2010; Petersen, 2009). The Supplemental Appendix (SA) Table SA.1 presents these results. I report a specification with firm-fixed effects along with year-fixed effects (Column [1]), a specification with firm and industry-by-year fixed-effects (Column [2]), a generalized

[11] https://carbonpricingdashboard.worldbank.org/map_data

linear model estimation "GLM" (Column [3]) and the Newey-West procedure to correct autocorrelation among residuals (Column [4]). I find, however, a negative relationship between *CEI Rating* and *Carbon Emission* with a strong statistical significance (i.e., at least $p<0.05$ for all).

Our sample period overlaps the great financial crisis (GFC) of the new millennium. To ensure that results do not a represent this period, I exclude the years 2007-9 (Cleary and Hossain, 2020) and re-estimate our main model. Our results remain consistent (see Column [1] of SA.2).

Some types of industries may also influence our results unduly. Though I control for industry indicators, I have undertaken a few sensitivity tests to ensure further robustness. I know that it is a common practice in financial economics literature to exclude finance sector firms. From Panel A of Table 1, I can observe that the Business Equipment sector, consisting primarily of IT firms, has one of the lowest carbon emissions with one of the highest *CEI Rating* scores. To ensure robustness, I have excluded financial firms, as well as IT firms from our sample, and then re-estimated the main model; in each of these two cases our results remain consistent. Columns (2) and (3) of SA.2, respectively present these results.

As a matter of note, California (n=269) and New York (n=203) together represent almost 27% of our sample. Moreover, these two states have strict carbon emission regulations, and politically both states are left leaning and thus more likely to be LGBT friendly. To eliminate the possibility that our results are not unduly influenced by observations from these two states, I have re-estimated my main model excluding CEFs that are headquartered in these two states. Our results remain consistent with that restriction as well (see Column 4, SA.2).

Our study could also be criticized for issues with the carbon emission measurements. I have therefore used a common proxy for carbon emissions in which carbon readings intensify as I scale the tonnage of greenhouse gas emissions with total assets. Though this is the most popular measure, other measures are available as well, such as raw emission tonnage, or industry adjusted emissions. It also seems prudent to ensure that our results remain robust over a rolling three-year average of emissions. Even when I employ all three measures the results in the current study remain consistent. I report these results in Table SA.3.

4.2.5 Endogeneity Tests

An empirical exploration like ours will always be open to criticism because of endogeneity concerns. Someone could argue that our analysis suffers from one or more of the following issues: omitted variable bias, measurement error, reverse causality, spurious correlation, and others. I have therefore undertaken several steps to address such concerns: (a) propensity score matched samples (Fang et al., 2014; Rosenbaum and Rubin, 1983; Shipman et al., 2017); (b) entropy balanced samples (Hainmueller, 2012; McMullin and Schonberger, 2020); (c) a two-stage least square (2SLS) instrumental variable (IV) approach (Chintrakarn et al., 2020; Hasan et al., 2022; Lee, 2007);[12] (d) a difference-in-differences approach using the 2015 SCOTUS ruling on LGBT rights as an exogenous shock (Dyck et al., 2019); (e) a system GMM approach (Blundell and Bond, 1998; Lee, 2007); and (f) alternate lagged specifications (Hossain et al., 2021; Hossain et al., 2022).

[12] We thank Hasan et al. (2022) for sharing their instrumental variables with us.

To maintain the flow of the main part of the paper, I have, therefore, reported the results and related discussions in the Supplemental Appendix (SA.4 to SA.9).

4.3 The Role of CEO Power and Governance

A recent study (Brodmann et al., 2021) documents that firms led by authoritative CEOs are more reluctant to invest in LGBT-friendly initiatives. Corporate governance can also affect a firm's environmental performance because strong boards are likely to be more sensitive to corporate legitimacy and reputation concerns (Bansal and Clelland, 2004). For example, firms with more independent directors are less likely to face environmental litigation (Kassinis and Vafeas, 2002). Similarly, Galbreath (2017), using a sample of Australian firms, finds board independence to be associated with stronger CSR performance. I conjecture, therefore, that when corporate governance is strong, and a CEO is *less* powerful, the observed negative relationship between CSOE and carbon emissions will be stronger. To evaluate this assumption, I run my main regression model (Eq. [1]) again once I have partitioned the sample based on the strength of corporate governance.

I have employed four measures of CEO power and corporate governance. The first, *CEO Duality*, is an indicator variable equal to one if the CEO and the Chair of the Board of Directors are the same person, and zero otherwise. CEOs are more powerful and have greater influence over the board when they also hold the chairperson position (Fracassi and Tate, 2012; Morse et al., 2011). Our second measure, *CEO Tenure* (the number of years the current CEO has been in his/her position as CEO) indicates CEOs with longer tenure are more powerful and enjoy less monitoring by a board (Brookman and Thistle, 2009; Dikolli et al., 2014; Graham et al., 2020).

The third measure, *Entrenchment* or the E-index proposed by Bebchuk et al. (2009), represents a widely used measure of governance. The E-index attempts to capture the degree of managerial entrenchment using six provisions firms employ to limit the extent to which shareholders can impose their will on management and enhance management's ability to fight hostile takeover attempts. A higher E-index value indicates greater managerial entrenchment and weaker governance. Finally, as a commonly used measure of external governance, I employ *Institutional Ownership*, where a higher level of institutional ownership entails stronger governance (Chung and Zhang, 2011).

Table 6 presents the results in split primarily according to the median. For each subsample I estimate Equation (1). Columns (1) and (2) split the sample by *CEO Duality* (not a median split); Columns (3) and (4) split the sample according to the median of *CEO Tenure*; Columns (5) and (6) split the sample by the median of the E-index value (*Entrenchment*); and Columns (7) and (8) split the sample by the median of *Institutional Ownership*. The results show that the negative relationship between CSOE and GHG (i.e., the coefficient of the *CEI Rating*) remains negative regardless of the quality of governance whether it is strong or weak, or the CEO is more powerful or not. However, the relationship is more prominent for a subsample of firms where governance is stronger, or a CEO is less powerful (boldfaced in the table). Overall, our findings in Table 6 confirm our conjecture that LGBT-friendly CEFs with strong governance and *less* powerful CEOs are responsible for lower level of carbon emissions.

4.4 Additional Tests

4.4.1 Ruling out alternate explanations

The CSR literature establishes that local norms and culture play a role in shaping the social responsibility status of constituent firms. For instance, Di Giuli and Kostovetsky (2014) find that liberals are more highly motivated to invest in CSR activities than conservatives. Therefore, I conclude that there is a close relationship between corporate social responsibility and the political views of the location where the CEF is headquartered on the one hand, and carbon emission on the other, and that the norms influencing CSR also influence carbon emissions. Hence, I control for a firm's CSR score and the political alignment of the state where its headquarters are located in our main model. I use *CSR*, calculated according to the methodology Lins et al. (2017) propose. Interestingly, to investigate documentation for political alignment, I employ *U.S. President Red,* a variable equal to one if the state voted for a Republican president in the last election, and zero otherwise. Columns (1) to (2) of SA.10 provide evidence that these factors do not alter our results.

Firms facing higher litigation risks understandably tend to be more transparent and to act in a more ethical manner (Houston et al., 2019; Marinovic and Varas, 2016). It is, therefore, not at all far-fetched to assume that firms facing higher litigation risk may take action to mitigate carbon emissions. If I control for *Litigation Risk* in our main model, results do not show inconsistency; rather, they remain consistent (Column [3]). Consistent with our argument, *Litigation Risk* is taken to be an indicator variable equal to one if the SIC code is one of the

following: 2833-2836; 3570-3577; 3600-3674; 5200-5961; 7370-7374; or 8731-8734 (Jha et al., 2021).

More liberal court jurisdictions exert stricter control over corporations, especially when these firms act in a way that is harmful to society. Recognizing the possible risks associated with carbon emissions, firms in such jurisdictions may take steps to lower their carbon footprint. To ensure that a liberal jurisdiction is not what is driving our results, we have controlled for *Liberal Court* (see Huang et al. [2019] for a definition).[13] Our results remain robust (see Column [4]). Not surprisingly, *Liberal Court* is loaded with a negative-significant coefficient, something we anticipated.

CEOs being the leaders of corporations set the vision, tone, and strategic directions of organizations. In a recent study, Hossain et al. (2022) have found that CEO risk-deterring incentives influence carbon emission. In this study, therefore, we control for various CEO characteristics, such as *CEO Age* (the age of a CEO in years), *CEO Tenure* (the number of years a CEO has been in her/his position), *CEO Female* (equal to one if a CEO is female and zero otherwise) and *CEO Risk Incentive* (proxied by CEO pay Vega as calculated by Coles et al. [2006]). Results in Column 5 show that our results are not sensitive to the inclusion of these variables as additional controls.

Finally, not surprisingly firms that are more transparent and monitored by outside entities are less likely to emit greenhouse gases or are at the least motivated to take initiatives to decrease

[13] This variable is also available via email from Dr. Allen Huang (allen.huang@ust.hk). His personal webpage is: allenhuang.org.

their carbon footprint. We use *Analyst Following* (the natural log of the number of analysts following a firm) as a proxy for transparency and monitoring. Notably, a larger number of analysts generally indicates greater transparency and monitoring (Chen et al., 2015; Li, 2020; Yu, 2008). The number of analysts monitoring a firm is also positively associated with ethical and responsible decision taken by firms (Bradley et al., 2021). Hence, CEFs with a higher number of analysts following them will be more likely to have a lower carbon footprint. To ensure that the number of analysts following a firm is not driving our results, we have controlled for *Analyst Following* in our main model. Our results remain consistent (see Column [6]). Not surprisingly, *Analyst Following* is loaded with a negative-significant coefficient, something we anticipated.

4.4.2 Direct and indirect emissions

While we employ total emissions (Scope 1 + Scope 2) as our main measure, *Carbon Emission*, studies commonly include direct emissions (Scope 1) in their analyses as well (Bolton and Kacperczyk, 2021; Ilhan et al., 2021; Safiullah et al., 2021). With this in mind, we have re-estimated our main model, replacing *Carbon Emission* with *Carbon Emission (Direct)* and *Carbon Emission (Indirect)*; we have presented the results in Table SA.11. Not surprisingly, the analysis indicates that direct emissions show stronger results (i.e., the coefficient for *CEI Rating* is much higher than for *Carbon Emission (Direct)*, a difference statistically significant [Chi-stat=3.12, p=0.07]).

5 Goodness of Heart or a Strategic Business Move?

5.1 Corporate sexual orientation equality and Carbon emission, and the implied cost of capital

Recent literature provides evidence that firms that pollute more pay a premium when raising capital (see Bolton and Kacperczyk, 2021; Chava, 2014; Oestreich and Tsiakas, 2015). This begs an interesting and significant question about the consequential relationship between CSOE and its influence on *Carbon Emission*, and the subsequent impact on the implied cost of capital *(ICC)*. Our study presumes one of two things is taking place: on the one hand, CEFs that undertake a greater level of CSOE initiatives are very likely to be more compassionate and sympathetic to stakeholders, resulting in lower carbon emissions, and a subsequent reduced *ICC*. However, this comes with a predictable negative relationship between *Carbon Emission* and *ICC* for high *CEI Rating CEFs* **(*stakeholder conjecture*)**. The investors and the stock market, on the other hand, will identify CEFs that spend more on CSOE activities as organizations spending shareholder money for a controversial cause, which is generally considered an agency issue. Hence, the market will demand a premium from such CEFs. This argument, however, conjectures a positive relationship between *Carbon Emission* and *ICC* for high *CEI Rating CEFs* **(*agency conjecture*)**. Here, I have looked at the effect of a higher *CEI Rating* on *Carbon Emission* and *ICC* relationship as an empirical question. Accordingly, I use the following regression model:

$$\boldsymbol{ICC_{i,t}} = \square + \square * \boldsymbol{Carbon\ Emission_{i,t}\ x\ High\ CEI\ Rating_{i,t}} + \square * Carbon\ Emission_{i,t} + \square * High\ CEI\ Rating_{i,t} + \square * Controls + Industry\ FE + Year\ FE + e_{i,t} \qquad [2]$$

The dependent variable here is the *ICC* of a firm and going along with recent literature, I use three widely used measures for the cost of capital,-using the average of those three measures to calculate our *ICC*.[14] Here, primary variable of interest and importance is the interaction term between *Carbon Emission* and the *High CEI Rating*, an indicator variable that equals to one if the *CEI Rating* is above the median. The regression model here includes controls adapted from recent literature (Chava, 2014; El Ghoul et al., 2012; Hossain and Kryzanowski, 2021). Following Chava (2014), I have used *Firm Size*; *Leverage*; *Market-to-book* (market value of assets to their book value), *Return Volatility* (the monthly stock return volatility over the past 12 months), *Lagged Return* (the monthly stock returns for the past twelve months) and *ROA*. To demonstrate the better reflection of the causal relationships, in addition to above, I have employed *Long-term Growth* (reported in I/B/E/S), Analyst *Dispersion* (the dispersion of analyst forecasts), and *Stock Beta* (the stock market beta for the firm) (El Ghoul et al., 2012). Following Hossain and Kryzanowski (2021), I have added demographic control measures, identical with the ones used in our main model that shows consistency throughout. It is mentionable here that all regressions continue to control for industry- and year-fixed effects.

I have estimated model based on Eq. [2] above for each of the three measures of *ICC*. Table 7 presents the results, which are consistent with our ***agency conjecture*** with a prediction that investors possibly find higher level of CSOE-initiatives undertaken by CEFs to be an agency issue and thus charge them a premium reflected by a higher level of *ICC*. The interaction term in Column (1) is negative and significant (coef=-0.0090; $p<0.01$), suggesting it is not beneficial for

[14] The three measures of cost of capital: Ohlson and Juettner-Nauroth's (2005) model, Claus and Thomas's (2001) model, and Gebhardt et al.'s (2001) model are available for explanations of these models for calculating *ICC*. El Ghoul et al. (2012) provide a detailed discussion in their Appendix 1 (pp. 512-513).

CEFs to engage in more CSOE initiatives. These results are consistent for each of the component *ICC* measures as well (see Columns [2] – [4]).

5.2 Corporate sexual orientation equality, Carbon emission and firm valuation

As mentioned before, the literature on the recent studies shows that CEFs face negative repercussion in terms of valuation. In line with similar arguments, Hsu et al. (2019) document that CEFs with high emission levels are subject to a pollution premium as any future environmental policy regime shift will likely risk the performance of such firms. Hsu et al. (2019) also find that such firms face greater litigation risk, and a greater risk of a significant decline in market values when environmental regimes shift. Another study, Matsumura et al. (2014), finds carbon emissions to be negatively associated with firm value. Bolton and Kacperczyk (2021) have shown carbon risk to be a systematic and economically significant risk factor that cannot be explained away by other known risk factors. Moody's and Standard & Poor's, both credit rating agencies, have issued warnings that industries with elevated levels of carbon emissions could suffer financially because governments, banks, and money managers try to lower the carbon intensity of their investments (Patterson and Ramkumar, 2021). In the current global context, high carbon emissions can reasonably be subject to a challenge of a firm's social legitimacy and organizational survival. In keeping with our conjectures in Section 5.1 above, I believe that when CEFs invest more in CSOE they will enhance a firm's value based on ***stakeholder conjecture*** **and** decrease a firm's value based on ***agency conjecture***. The following formula expresses this notion:

$$\textbf{Tobin's } Q_{i,t} \textbf{ (or Industry Adjusted Tobin's Q)} = \square + \square * \textbf{Carbon Emission}_{i,t} \textbf{ x High CEI Rating}_{i,t} + \square * Carbon\ Emission_{i,t} + \square * High\ CEI\ Rating_{i,t} + \square * Controls_{i,t} + Industry\ FE + Year\ FE + e_{i,t} \quad [3]$$

Here the dependent variable is *Tobin's Q*. I also use *Industry Adjusted Tobin's Q* (for a given year *t*; the difference between a firm's Tobin's Q and its average Tobin's Q in the Fama-French (FF-49) industry listing, in keeping with the extant literature (Eisenberg et al., 1998; Jo and Harjoto, 2011; Villalonga and Amit, 2006;). As noted above, the interaction term between *Corruption* and the *High CEI Rating,* an indicator variable, and the main variable of interest for our study, equals one if the *CEI Rating* is above the median. The regression model includes controls from recent literature (Villalonga and Amit, 2006). I use *Firm Size*, *Leverage*; *Stock Beta*, *Capex*, *R&D*, *Long Term Growth Dividend* (dividend scaled by total assets), *ROA* and *Analyst Dispersion*. I use *Long-term Growth* (reported in I/B/E/S), and *Dispersion* here implies the dispersion of analyst forecasts and *Stock Beta* means the stock market beta for the firm (Jo and Harjoto, 2011; Villalonga and Amit, 2006). Finally, I have added the demographic controls in our model. Therefore, just to restate, all regressions control for industry- and year-fixed effects.

Table 8 presents the results of this part of our investigation. I estimate the model based on Eq. [3] above for both proxies for market valuation. As expected, the results support our ***agency conjecture*** which predicts that investors could possibly consider CSOE spending of CEFs an agency issue, potentially resulting in a decreased firm-value. As predicted, the interaction term in Column (1), both negative and significant (coef=-0.0023; $p<0.05$), indicates that it is not

beneficial for CEFs to engage in further CSOE initiatives. The results are consistent when I use *Industry Adjusted Tobin's Q* as an alternative to firm valuation.

5.3 Discussion of Results

The results presented in Sections 5.1 and 5.2 indicate that the market is not treating CEFs with higher level of CSOE spending positively. They end up paying a higher premium to raise equity capital and suffer from lower market valuation. A relevant question could be why these firms are investing in such initiatives, an issue that needs further in-depth investigation in a future study. I can offer one possibility. It is based on *a moral high ground story.* From this point of view, under the leadership of those CEFs they are inclined to spend more money on CSOE initiatives because they believe that this is the right thing to do.

6. Concluding Remarks, Limitations and Future Studies

6.1 Remarks

A primary and essential issue in contemporary management and business ethics is to find ways to make corporations act responsibly and diligently towards the natural environment. =Yet investigations that currently dominating studies in the carbon emission literature reveal no exceptions in the effect of carbon emission on various corporate events and policies, strategy, and ethics. In a recent study, Hossain et al. (2022) examine a possible factor that could influence a firm's GHG emission. They find that CEO risk-deterring incentives are having a negative impact, because a higher level of such incentives could potentially result in a higher level of GHG emission. Considering that possibility, I have tried in my paper to examine whether a

carbon-emitting firm's (CEF) tolerance towards LGBT employees influences their carbon footprint, and hence affect global warming and climate change positively.

To understand the relationship between corporate sexual orientation equality (CSOE) and carbon emissions better, I build two competing arguments borrowing from different perspectives, namely business ethics, strategic management, and financial economics literature. In our study, I predict a negative relationship between CSOE and GHG emissions focussing on business ethics and stakeholder theories on the premise that it is the right thing to do and that it is beneficial for the CEFs in the long run. I therefore predict a positive relationship between CSOE and GHG emissions based on agency and transactional perspectives on the assumption that it might be costly up front, long-term benefits may not be guaranteed, and CSOE initiatives could simply be a publicity stunt (i.e., a *warm-glow-effect* venture). Thus, the relationship between CSOE and GHG emission, theoretically speaking, is an open one, and is why I have investigated this as an empirical exercise.

In my analysis, I use the Human Rights Campaign's (HRC) data for large U.S. firms for the sample period 2003 to 2019 for a final tally of 1,736 firm-year observations from 260 unique CEFs. I find compelling evidence that the level of CSOE initiatives undertaken to safeguard equality and fairness to their LGBT employees supported and provided by a CEF is related negatively to its carbon (GHG) emission level. This is, of course, consistent with the stakeholder perspective. The results of our study remain robust in numerous endogeneity and sensitivity tests, including a quasi-natural experiment around the SCOTUS ruling in 2015 that gave LGBT people equal rights across the United States. Additional tests reveal the negative relationship

between CSOE ratings and GHG emissions is more distinct for firms with less agency issues, namely *less* powerful CEOs, and *stronger* monitoring in practice.

Once I identified convincing evidence for the negative relationship between CSOE ratings and GHG emissions in CEFs, I asked myself why they are continuing this trajectory, and whether there is any tangible or other benefits accruing to them. To answer these pertinent questions, I conduct two additional tests. I investigate the impact of CEFs investing in a higher level of CSOE initiatives on firm valuation and on the cost of raising capital. The natural and logic conclusion would be that companies experience an increase in firm valuation and a decrease in the cost of raising capital. Instead, our findings are the opposite, but I must leave such an investigation to a future study. Though I have provided some well-informed conclusions in Section 5.3, I believe an extensive study and examination focused on this issue is a desideratum.

6.2 Future

The current study, corporate sexual orientation equality and carbon emission, is still preliminary in nature for the area I have been exploring. I believe my study has some important implications for academic research, policymakers, and practitioners. *First*, the subject of our study is very relevant and widely discussed in academia, literature, the popular press, and related agencies, adding to the growing literature on carbon emission, climate risk, and sustainability. Interestingly, it extends further the story started by Hossain et al. (2022), changing the focus from ‘the effects of carbon emission’ to a broader area encompassing ‘the factors that have potential influence on carbon emission,’ a topic that has not been examined. *Second*, I have

added significant evidence for extending LGBT-employee rights, demonstrating that CEFs with a higher level of LGBT-employee rights can induce responsible environmental policy by means of reduced GHG emissions, something being looked for around the globe. *Third*, policymakers, influential institutional investors, and concerned governments should turn their attention to a firm's LGBT initiatives because that would potentially enhance a firm's reputation with a consequential positive impact on the financial position of the firm, on fairness, equality, and potential environmental sustainability. *Fourth*, our findings demonstrate that firms with governance and agency issues are less likely to reduce GHG emissions, underscoring the nation that fairness, in the form of governance, influences the moral compass of a firm.

6.3 Limitations

Our study is an empirical exercise and, not surprisingly, it is not immune to possible limitations. To mention a few: HRC only collects data on large U.S. firms limiting our study to that data. This limitation has prevented us from generalizing our findings to small and medium enterprises or to international firms, something could exert influence on the issue being investigated. Secondly, the GHG emission disclosure is a voluntary process, which means that there could be CEFs out there that have–for whatever reason–decided not to disclose their emission status. However, the disclosure of this data forms the basis for investigations and currently provides the best possible source of data. The more firms that participate in making the data available, the more accurate conclusions will be. Readers should therefore use caution in generalizing our findings. The issue is a growing concern for nearly in all countries in the world, and I can expect regulators and financial bodies to mandate firms to make their LGBT and GHG emission data publicly available sooner rather than later. This will ensure that future researchers will have more

cross-sectional data to address and extend the kinds of research questions I have tried to explore in this study.

7. Appendix 1 – Variable Definitions

Variables	Definition
	MAIN VARIABLES
Carbon Emission	Total carbon emissions (Scope 1 + Scope 2) scaled by total assets.
CEI Rating	Corporate Equality Index (CEI) Rating (provided by Human Rights Campaign (HRC) annual reports) divided by 100. HRC started to collect data on sexual orientation non-discrimination policies, gender-identity non-discrimination policies, domestic partner benefits and transgender policies for S&P 500, Fortune 500, and Forbes's largest 200 private firms in 2002. The minimum score provided by HRC for CEI Rating is 0 and the maximum score is 100.
Firm Size	The natural log of total assets.
Leverage	The total debt scaled by total assets.
Tobin's Q	The ratio of market value of assets to book value of assets where market value of assets is total debt plus the market value of equity.
ROA	Operating income divided by total assets.
Tangibility	Property, plant, and equipment divided by total assets.
Capex	Capital expenditure scaled by total assets.
R&D	R&D expense scaled by total assets.
ROAVOL	The Standard deviation of ROA over the preceding three years with all three data points required to be available for a given firm.

KZ Score	A measure of financing constraints. We measure it as: -1.002*(OIBDP/AT) - 39.3687*(DV/AT) - 1.315*(CHE/AT) + 3.139*leverage + 0.283*Tobin's Q
Population Density	The population of a state scaled by its area in square miles.
Local Income	The natural log of GDP per capita.
Education	The high school attainment rate.
	OTHER VARIABLES
Analyst Dispersion	The standard deviation of analyst forecasts.
Analyst Following	The natural log of the number of analysts following a firm.
CEO Age	A CEO's age in years.
CEO Duality	An indicator variable that equals one if the CEO and the Chair of the Board of Directors are the same person and zero otherwise.
CEO Female	An indicator variable that equals one if the CEO is female.
CEO Risk Incentive	Proxied by CEO pay vega as calculated by Coles et al. (2006). This shows CEO pay sensitivity to stock price volatility. A higher value for CEO pay vega indicates a higher level of risk incentive.
CEO Tenure	The number of years the current CEO has been in his/her position as CEO.
CSR	Corporate Social Responsibility gauged by the Lins et al. (2017) methodology. We use the community, diversity, employee relations, and environment components of the Risk Metrics dataset. We divide the strengths (concerns) for each category by the maximum strength

	(concern) score for that given year. Then we add the adjusted scores to obtain the aggregate strength (concern) score for that observation. To get the final composite score we subtract the concern score from the strength score. Our score can range from -1 to +1 for each category, and from -5 to +5 overall.
Dividend	Cash dividend scaled by total assets.
Entrenchment	Bebchuk et al.'s (2009) Entrenchment Index or E-index which ranges from 0 to 6 with 0 being the most democratic firm. A higher value signifies weaker governance.
Industry Adjusted Tobin's Q	For a given year t, this represents the difference between a firm's Tobin's Q and its average Tobin's Q in Fama-French industries (FF-49 code)
Institutional Ownership	The percentage of stocks owned by institutional shareholders as reported by Thomson Reuters.
Kavg	This measure is the average of three commonly used methods to calculate the implied cost of capital: Ohlson and Juettner-Nauroth (2005); Claus and Thomas (2001); and Gebhardt et al. (2001). We request the reader to consult these papers for further insight into these models for calculating ICC. El Ghoul et al. (2012) has a detailed discussion in their Appendix 1 (pp. 512-513).
Kct	The implied cost of capital based on the Claus and Thomas (2001) method.

Kgls	The implied cost of capital based on the Gebhardt et al. (2001) method.
Kojn	The implied cost of capital based on the Ohlson and Juettner-Nauroth (2005) method.
Lagged Return	Monthly stock returns for the past twelve months.
Liberal Court	The data is provided by Huang et al. (2019). According to the authors it is "the probability that Democratic presidents' appointees dominate a panel of three judges randomly selected from the circuit" (p. 446).
Litigation Risk	An indicator variable that equals one if the SIC code is one of the following: 2833-2836; 3570-3577; 3600-3674; 5200-5961; 7370-7374; or 8731-8734
Long Term Growth	As reported in I/B/E/S.
Market-to-book	The market value of equity scaled by book value of equity.
Return Volatility	The monthly stock return volatility over the past 12 months
Stock Beta	The stock market beta for a firm, calculated by regressing the 60 monthly stock returns ending June of year *t* on the corresponding monthly CRSP value-weighted index returns.
U.S. President Red	An indicator variable that equals one if the state where the firm is headquartered voted for a Republican presidential candidate in the previous election and zero otherwise.

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9. Tables

Some variables in this table are used as controls in the initial analysis and others are used as part of your robustness check and endogeneity analyses.

9.1. Table 1: Summary Statistics

Panel A. Industry-by-industry distribution of million metric tonnes of carbon emissions

Industry	N	Mean	SD	p25	p50	p75
Consumer Non-Durables	191	1.59	1.88	0.30	0.88	1.65
Consumer Durables	57	2.23	2.87	0.18	0.71	4.79
Manufacturing	218	3.31	5.28	0.38	0.92	4.53
Energy	106	33.60	36.10	4.64	15.40	62.30
Chemicals	95	2.73	2.82	0.58	0.95	4.78
Business Equipment	275	0.81	1.05	0.12	0.39	1.06
Telecom	26	3.82	2.34	1.53	3.39	5.94
Utilities	202	36.00	33.30	7.73	28.90	55.70
Shops (Retail)	167	3.22	5.49	0.42	1.34	2.87
Healthcare	91	1.03	0.80	0.27	1.12	1.50
Finance	85	0.21	0.27	0.08	0.10	0.22
Other	223	8.84	13.70	0.29	4.98	12.70
Total	1,736	8.75	19.90	0.29	1.26	5.75

Panel B. Industry-by-industry distribution of CEI rating (non-decimalized)

Industry	N	Mean	SD	p25	p50	p75
Consumer Non-Durables	191	77.65	27.64	60	90	100
Consumer Durables	57	70.35	39.71	15	100	100
Manufacturing	218	70.82	31.13	45	85	100
Energy	106	39.70	35.98	15	30	70
Chemicals	95	73.99	29.12	60	85	100
Business Equipment	275	84.95	27.51	85	100	100
Telecom	26	90.04	17.60	85	100	100
Utilities	202	70.51	27.43	55	75	95
Shops (Retail)	167	80.32	27.37	75	90	100
Healthcare	91	91.35	16.46	86	100	100
Finance	85	91.89	15.93	90	100	100
Other	223	75.78	27.14	70	85	100
Total	1,736	75.98	30.24	60	90	100

9.2. Table 2: Descriptive Statistics

Variables	N	Mean	SD	p25	p50	p75
Carbon Emission	1,736	22.07	40.76	1.49	5.72	21.23
Carbon Emission (million metric tons)	1,736	8.75	19.91	0.29	1.26	5.75
CEI Rating	1,736	0.76	0.30	0.60	0.90	1.00
CEI Rating (raw)	1,736	75.98	30.24	60.00	90.00	100.00
Market Value ($ millions)	1,736	48,650	65,413	10,452	21,458	54,077
Total Assets ($ millions)	1,736	52,044	84,424	10,687	23,952	48,563
Firm Size	1,736	17.02	1.21	16.17	16.98	17.69
Leverage	1,736	0.28	0.15	0.17	0.27	0.37
Tobin's Q	1,736	1.94	0.97	1.22	1.64	2.33
ROA	1,736	0.15	0.07	0.09	0.14	0.18
Tangibility	1,736	0.32	0.25	0.10	0.23	0.55
Capex	1,736	0.05	0.03	0.02	0.04	0.06
R&D	1,736	0.02	0.03	0.00	0.00	0.03
ROAVOL	1,736	2.60	3.40	0.66	1.46	2.98
KZ Score	1,736	-0.03	0.98	-0.56	0.16	0.60
Population Density	1,736	5.26	0.80	4.63	5.40	5.71
Local Income	1,736	10.91	0.18	10.79	10.91	11.03
Education	1,736	85.50	2.44	84.62	85.97	86.82

9.3. Table 3: Correlation Matrix

No.	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	*Carbon Emission*	1													
2	*CEI Rating*	-0.21***	1												
3	*Firm Size*	0.05*	0.16***	1											
4	*Leverage*	-0.15***	-0.06***	0.02	1										
5	*Tobin's Q*	-0.26***	-0.16***	-0.24***	-0.08***	1									

6	*ROA*	-0.17***	0.05**	-0.23***	-0.14***	0.71***	1					
7	*Tangibility*	0.52***	-0.23***	0.09***	0.16***	-0.25***	-0.03	1				
8	*Capex*	0.29***	-0.19***	0.04	0.02	-0.09***	0.22***	0.73***	1			
9	*R&D*	-0.25***	0.21***	-0.03	-0.21***	0.37***	0.29***	-0.39***	-0.20***	1		
10	*ROAVOL*	-0.05**	-0.06**	-0.17***	0	0.01	-0.03	-0.02	0.02	0.19***	1	
11	*KZ Score*	0.19***	-0.02	0.45***	-0.02	-0.14***	-0.04***	0.02	1			

		**	0.12***		**	0.43***	0.52***	**		0.30***				
12	*Population Density*	-0.18***	0.18***	0.10***	-0.01	0.03	-0.04	-0.32***	-0.26***	0.20***	-0.06**	0.02	1	
13	*Local Income*	-0.28***	0.21***	0.10***	0	0.12***	-0.04**	-0.29***	-0.21***	0.14***	-0.04**	-0.04	0.43***	1
14	*Education*	0.04**	-0.08***	0	-0.07***	-0.06***	0.03	0	0.01	-0.03	0.06**	-0.01	0.06***	-0.19***	1

Note: *, **, and *** mean significance at 10%, 5% and 1% level, respectively.

9.4. Table 4: Univariate test of means between high and low CEI rating firms.

Variables	High CEI Rating	Low CEI Rating	Diff. in mean High - Low	t-stat for diff.
Carbon Emission	10.23	31.71	-21.47	-11.31***
Firm Size	17.23	16.85	0.38	6.53***
Leverage	0.26	0.29	-0.04	-5.10***
Tobin's Q	2.11	1.80	0.30	6.52***
ROA	0.15	0.14	0.01	3.12***
Tangibility	0.24	0.38	-0.13	-11.34***
Capex	0.04	0.05	-0.01	-7.08***
R&D	0.03	0.01	0.02	11.09***
ROAVOL	2.62	2.59	0.03	0.18
KZ Score	-0.18	0.09	-0.27	-5.77***
Population Density	5.39	5.15	0.24	6.28***
Local Income	10.97	10.87	0.10	11.84***
Education	85.18	85.76	-0.58	-4.98***
Observations	779	957		

Note: *, **, and *** mean significance at 10%, 5% and 1% level, respectively.

9.5. Table 5: Test of H1 – the effect of CSOE on carbon emission

Variables	Dependent Variable = Carbon Emission		
	(1)	**(2)**	**(3)**
CEI Rating	**-10.4251*** **	**-13.1086*** **	**-16.2282*** **
	(-3.27)	**(-4.20)**	**(-5.06)**
Firm Size	-1.1362*	-1.2024*	
	(-1.66)	(-1.79)	
Leverage	6.3816	4.6634	
	(1.27)	(0.94)	
Tobin's Q	-2.7774***	-3.1475***	
	(-3.46)	(-4.08)	
ROA	31.8856**	31.5287**	
	(2.30)	(2.36)	
Tangibility	32.1019***	37.6220***	
	(3.81)	(4.48)	
Capex	-71.7637*	-72.5015**	
	(-1.95)	(-2.02)	
R&D	-29.7368*	-13.4248	
	(-1.66)	(-0.83)	
ROAVOL	0.3819*	0.4249**	
	(1.79)	(2.09)	
KZ Score	1.3129**	1.3300**	

	(2.31)	(2.42)	
Population Density	-2.6484*		
	(-1.87)		
Local Income	-18.8564***		
	(-3.10)		
Education	0.3409		
	(1.17)		
Constant	231.5900***	43.2980***	34.4005***
	(3.25)	(3.94)	(12.89)
Observations	1,736	1,736	1,736
R-squared	0.532	0.525	0.511

Note: This table presents regression results using Eq. [1]. Each regression uses industry and year indicator variables. In parentheses, we report robust *t*-statistics. *, **, and *** mean significance at 10%, 5% and 1% level, respectively.

9.6. Table 6: The role of agency on CSOE and carbon emission relationship.

Variables	Dependent Variable = Carbon Emission							
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
	CEO Duality		*CEO Tenure*		*Entrenchment*		*Institutional Ownership*	
	Yes	No	Long	Short	High	Low	High	Low
CEI Rating	-5.8593	**-31.1516****	-2.4004	**-20.3083****	-0.7767	**-10.8826*****	**-11.2813****	-6.9023**
	(-1.58)	**(-4.07)**	(-0.51)	**(-3.99)**	(-0.13)	**(-2.63)**	**(-2.36)**	(-2.00)
Firm Size	-1.4349	-1.2953	-2.4573***	0.3154	0.9226	-2.0758**	-3.3176**	-1.0561
	(-1.41)	(-0.67)	(-2.83)	(0.24)	(0.50)	(-2.52)	(-2.56)	(-1.10)
Leverage	-6.4244	29.5113*	8.9822	9.9310	-2.3670	9.9855	23.0096**	9.1263
	(-0.94)	(1.84)	(1.34)	(1.20)	(-0.29)	(1.47)	(2.44)	(1.37)
Tobin's Q	-1.9454	-3.0898	-2.0744**	-4.1570***	-4.6388***	-3.0776***	-5.0129***	-2.0086*
	(-1.52)	(-1.02)	(-2.07)	(-2.72)	(-2.79)	(-3.06)	(-2.64)	(-1.84)

ROA	35.3541*	20.6787	30.8018	40.3147**	-34.3127	54.0671***	51.0703*	1.0045
	(1.67)	(0.42)	(1.43)	(1.96)	(-1.37)	(3.26)	(1.74)	(0.06)
Tangibility	-12.9334	61.4440***	38.1171***	27.1001**	14.7150	35.1514***	13.1743	-3.0979
	(-1.31)	(3.33)	(3.39)	(2.20)	(0.87)	(3.20)	(1.20)	(-0.31)
Capex	-74.2010*	-152.7732	-124.6424**	-40.6001	72.7207	-114.6514***	-74.5266	75.0489
	(-1.74)	(-1.41)	(-2.08)	(-0.82)	(0.76)	(-2.76)	(-1.14)	(1.55)
R&D	-43.4752	62.8748	-55.6940**	-8.8487	-86.5867	-23.9348	-90.5861	-4.6716
	(-0.96)	(0.46)	(-2.32)	(-0.28)	(-1.31)	(-1.24)	(-1.54)	(-0.22)
ROAVOL	0.0201	1.0231**	0.4339	0.5714*	0.5907*	0.1034	0.6878*	-0.0744
	(0.06)	(1.98)	(0.88)	(1.95)	(1.93)	(0.31)	(1.91)	(-0.33)
KZ Score	1.0082	10.9172***	2.0700**	-0.5339	0.8816	1.4571*	3.0674*	1.0583
	(1.02)	(3.28)	(2.52)	(-0.51)	(0.89)	(1.94)	(1.96)	(1.52)

Population Density	0.8104	8.1043***	-3.0515	-2.3252	3.4924	-4.9666***	0.9198	-5.8540**
	(0.65)	(2.73)	(-1.61)	(-0.98)	(1.16)	(-2.72)	(0.42)	(-2.42)
Local Income	-63.0977***	-11.8571	-21.1088***	-12.0408	-2.6831	-25.8471***	-22.3716***	-25.8274**
	(-8.37)	(-0.74)	(-2.73)	(-1.13)	(-0.23)	(-3.37)	(-2.97)	(-2.43)
Education	0.0760	-0.5003	0.6453	0.1057	-0.0099	0.1776	0.0439	0.0349
	(0.24)	(-0.66)	(1.26)	(0.27)	(-0.03)	(0.49)	(0.11)	(0.10)
Constant	737.0555**	172.7613	246.3102**	158.7974	26.2154	348.8629**	315.2579**	355.3510**
	*		*			*	*	*
	(8.34)	(0.88)	(2.63)	(1.28)	(0.20)	(3.77)	(3.29)	(3.04)
Observations	1,019	371	859	877	526	1,210	868	868
R-squared	0.584	0.680	0.562	0.533	0.715	0.518	0.576	0.641
Chi-stat	3.60		3.47		0.63		0.65	
Chi-test-p-value	0.05		0.06		0.42		0.42	

Note: This table presents split sample regression results from estimating Eq. [1]. Columns (1) and (2) split the sample based on CEO duality; Columns (3) and (4) split the sample based on the median CEO tenure; Columns (5) and (6) split the sample based on the median level of E-index; and finally, Columns (7) and (8) split the sample based on the median-level of institutional ownership. Each regression uses industry

and year indicator variables. In parentheses, we report robust *t*-statistics. *, **, and *** mean significance at 10%, 5% and 1% level, respectively.

9.7. Table 7: Corporate sexual orientation equality, carbon emission and implied cost of capital.

Dependent Variable =>	**Kavg**	**Kojn**	**Kct**	**Kgls**
Variables	**(1)**	**(2)**	**(3)**	**(4)**
Carbon Emission x High CEI	**0.0090*** **	**0.0116** **	**0.0092** **	**0.0063**
	(2.73)	**(2.50)**	**(2.11)**	**(1.63)**
Carbon Emission	0.0071***	0.0061**	0.0043*	0.0109***
	(3.96)	(2.53)	(1.67)	(6.26)
High CEI	0.1013	0.0399	0.1021	0.1617
	(0.93)	(0.26)	(0.78)	(1.22)
Firm Size	0.1838***	0.1057	0.2759***	0.1696***
	(3.20)	(1.31)	(4.04)	(2.64)
Leverage	1.8223***	2.8494***	2.3259***	0.2916
	(4.15)	(4.77)	(4.07)	(0.56)
Market-to-book	-0.0333***	-0.0154*	-0.0378***	-0.0468***
	(-4.30)	(-1.72)	(-4.03)	(-4.37)
Return Volatility	6.3283***	3.5097	2.8265	12.6486***
	(3.02)	(1.14)	(0.99)	(4.82)
Lagged Return	6.1368**	0.9372	5.0532	12.4200***
	(2.02)	(0.22)	(1.21)	(3.97)
ROA	-2.4953**	-2.7363**	0.4789	-5.2284***
	(-2.56)	(-2.18)	(0.41)	(-4.29)
Long-term Growth	0.0001	0.0327**	-0.0250*	-0.0074

	(0.01)	(2.26)	(-1.78)	(-0.69)
Analyst Dispersion	1.5870	0.1272	0.5349	4.0990***
	(1.61)	(0.10)	(0.43)	(4.07)
Stock Beta	1.3120***	1.7555***	1.3942***	0.7863***
	(9.09)	(7.54)	(8.04)	(4.89)
Population Density	0.1241*	-0.0112	0.2041**	0.1794**
	(1.90)	(-0.13)	(2.32)	(2.36)
Local Income	-1.2991***	-1.1774***	-1.9275***	-0.7925**
	(-4.14)	(-2.62)	(-4.87)	(-2.12)
Education	0.0173	0.0012	0.0198	0.0308
	(0.90)	(0.05)	(0.80)	(1.25)
Constant	15.9802***	18.3356***	20.0681***	9.5368**
	(4.09)	(3.39)	(4.01)	(2.09)
Observations	1,452	1,452	1,452	1,452
R-squared	0.579	0.450	0.538	0.508

Note: This table presents results from estimation of Eq. [2]. Columns (1), (2), (3), and (4) report results with an average of the three most prominent measures to calculate ICC (i.e., Ohlson and Juettner-Nauroth, 2005; Claus and Thomas, 2001; and Gebhardt et al., 2001), and each of these component measures, respectively, as the dependent variables. Each regression uses industry and year indicator variables. In parentheses, we report robust *t*-statistics. *, **, and *** mean significance at 10%, 5% and 1% level, respectively.

9.8. Table 8: Corporate sexual orientation equality, carbon emission and firm valuation.

Dependent Variable =>	**Tobin's Q**	**Industry Adjusted Tobin's Q**
Variables	**(1)**	**(2)**
Carbon Emission x High CEI	**-0.0023****	**-0.0017****
	(-2.28)	**(-2.05)**
Carbon Emission	-0.0011***	-0.0012***
	(-3.19)	(-3.74)
High CEI	0.0242	-0.0101
	(0.60)	(-0.26)
Firm Size	-0.0794***	-0.0821***
	(-4.72)	(-4.85)
Leverage	0.3188**	0.3061**
	(2.38)	(2.39)
Stock Beta	-0.0846**	-0.0633
	(-2.15)	(-1.56)
Capex	-3.6050***	-3.2852***
	(-4.16)	(-3.87)
R&D	6.5514***	6.2324***
	(4.88)	(5.10)
Long Term Growth	0.0131***	0.0101***
	(5.06)	(4.39)
Dividend	1.2968*	1.2908*

	(1.78)	(1.90)
ROA	8.0657***	6.7990***
	(16.31)	(14.20)
Analyst Dispersion	-0.9497***	-0.9046***
	(-4.30)	(-4.06)
Population Density	-0.0081	-0.0008
	(-0.43)	(-0.04)
Local Income	0.3479***	0.3737***
	(3.19)	(3.44)
Education	0.0010	-0.0014
	(0.15)	(-0.21)
Constant	-1.7352	-3.5636***
	(-1.34)	(-2.78)
Observations	1,660	1,660
R-squared	0.715	0.480

Note: This table presents results from estimation of Eq. [3]. Columns (1) and (2) report results with a firm's Tobin's Q and its industry-adjusted Tobin's Q, respectively, as the dependent variables. Each regression uses industry and year indicator variables. In parentheses, we report robust *t*-statistics. *, **, and *** mean significance at 10%, 5% and 1% level, respectively.