Cultural Anchors: Exploring the Link between CEO Long-Term Orientation and Environmental Performance

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June 2024

EARLY DRAFT

Abstract

This study explores the relationship between CEO ancestry and corporate sustainability practices. While prior research reports differences in sustainability strategies between cultures, many external factors could drive this effect. We focus on firms located in the US to get a within-country view and thereby keep external factors like laws and regulations as stable as possible. By focussing on the dimension of long-term orientation, we examine its relationship with environmental intentions and outcomes. We find that long-term orientation positively relates to environmental outcomes. This is robust to using CO2 emissions instead of an aggregated score. Furthermore, we employ an instrumental variable to instrument for long-term orientation. The contribution of this research is twofold. First, it advances the understanding of corporate decision-making based on the decision-maker's cultural ancestry. In particular, we consider the case of a multi-criteria trade-off which is integral of the triple bottom-line principle. Second, using granular environmental information instead of aggregate ESG ratings enables us to distinguish between environmental intentions and outcomes.

JEL classification: G41, M14, Z10

Keywords: Corporate Social Responsibility, Cultural Finance, Cultural Ancestry, Hofstede Dimensions, GLOBE, Long-Term Orientation

I. INTRODUCTION

"Life is a matter of choices, and every choice you make makes you"

John C. Maxwell

Over the last decades, the choices that were made around the world, have severely harmed the planet and the people living on it (*Consequences of Climate Change - European Commission*, n.d.). The current generation has to make changes to stop this cycle. However, these choices are not easy to make, are not necessarily popular, and someone has to pay the price for them. To advance global sustainability, understanding the mechanisms and reasons behind these decisions, as well as identifying who makes them, is crucial. As companies emit the majority of CO2, use millions of gallons of clean water, and produce most waste, this group is uniquely qualified to make a change in the world (*Causes of Climate Change - European Commission*, n.d.). A shift in focus within firms from a single bottom line, profit, to a triple bottom line (TBL), including the planet and people, represents this change. This paper explores how to achieve this TBL by investigating people's willingness to make 'sustainable' decisions, identifying who these people potentially are, and what drives them.

Current research underlying the heterogeneity of Corporate Social Responsibility (CSR) activities primarily focuses on industry and firm characteristics and does not provide a direct explanation for all the differences between firms. A firm's CSR strategy involves a multitude of trade-offs and judgment calls. The triple bottom line principle creates a multifaceted optimization problem, that warrants managerial judgment and subjective estimations (Luo & Tang, 2016a). Cultural background is a personal attribute that influences (financial) decision-making. Hambrick and Mason (1984) show that cultural background, together with other personal characteristics, indeed influences financial decision-making and refer to this as the Upper Echelons theory. Yet, when it comes to the triple bottom line approach, which requires balancing profit, planet, and people, studies are scarce. Consequently, there is a need for research to explore how cultural background shapes CEOs' valuation of not just financial, but also environmental and social performances.

Motivation plays a crucial role in the decisions individuals make, and the dynamics of motivation have been the subject of research for many years (Fishbach & Woolley, 2022; Lai, 2011; Osterloh et al., 2001). A key insight from these studies is that intrinsic motivation, which is driven by internal desires rather than external rewards, is more powerful than motivation driven by extrinsic rewards (Edmans et al., 2022a; Fishbach & Woolley, 2022; Lai, 2011).

Intrinsic motivation often stems from making choices that align with one's values (Fishbach & Woolley, 2022). These values are shaped over a lifetime, influenced by all of one's experiences and significantly shaped by upbringing. Family and community, which are in turn influenced by the culture into which one is born, play a major role in forming these values. This cultural influence persists across generations, even when families relocate to different countries. Hence, culture is transmitted through generations regardless of geographical location (Hofstede et al., 2010).

This study in particular examines the cultural ancestry of corporate decision-makers to explain part of the heterogeneity within CSR. Cultural values are an intrinsic characteristic instilled early in life through socialization influencing corporate outcomes (Pan et al., 2020) and have an important influence on the programming of the mind, and thereby also on decision-making (Hofstede et al., 2010). Therefore, we predict that a CEO's cultural ancestry influences decision behavior regarding corporate social responsibility. A proper understanding of the underlying motivations for a firm's approach towards sustainability based on cultural characteristics helps to identify the right decision-makers to match a firm's desired sustainability strategy.

This study aims to answer the following research question. *What is the relationship between a CEO's cultural ancestry and the corporate responsibility of the firm?* This study aims to answer this question by comparing the different cultural backgrounds of USA-based CEOs and compare those to the environmental intentions and outcomes of the firm. In this way, we can differentiate between the sustainability strategies of firms from a personal motivation point of view. In a sample of 1,491 US-listed firms, over the period 2006-2020 (12,885 firm-year observations), we investigate how a CEO's cultural ancestry affects sustainability behavior. Using more than 131 separate environmental metrics at the firm-year level from Refinitiv, we create two CSR scores (environmental *outcomes*, which relate to *substantial* actions; and environmental *intentions* which are more *symbolic*) using Wittkowski's (2003) multi-criteria rank ordering algorithm.[1] We use the method of separating sustainability intentions and outcomes to attempt to reduce the opaqueness of ESG ratings. The quality of aggregate ratings is questionable at best and have a very low correlation between rating agencies (Berg et al., 2022).

[1]The 333 metrics are either attributed to environmental intentions, including reporting, monitoring, targets and activity metrics, or environmental outcomes, including performance and controversy metrics. The appendix provides a detailed breakdown of the variables environmental intentions and outcomes.

Following an interdisciplinary literature on name-based ethnicity classification, we use a CEO's family name to identify the CEO's cultural ancestry (Cook et al., 1972; Mateos, 2007). This name-based ethnicity classification is based on paternal cultural heritage. To be able to quantify the cultural heritage of a CEO, we employ the cultural dimensions of Hofstede (1980) and Hofstede et al. (2010). The six dimensions of Hofstede are Power Distance, Individualism, Masculinity, Uncertainty Avoidance, Long-Term Orientation, and Indulgence. We focus on the dimension 'Long-Term Orientation' in this study as it comes closest conceptually to sustainability.

"Long-Term Orientation stands for the fostering of virtues oriented towards future rewards, in particular, perseverance and thrift. Its opposite pole, Short-Term Orientation, stands for the fostering of virtues related to the past and present, in particular, respect to tradition, preservation of 'face' and fulfilling social obligations" (Hofstede, 2001, p. 359). Long-Term Orientation is one of the dimensions that was added at a later stage by Hofstede and is included in the current study as it conceptually comes closest to sustainability. In our analyses, we find that long-term orientation is indeed positively associated with environmental outcomes which confirms our hypothesis.

This study contributes to two streams of literature. First, it contributes to the corporate decision-making literature and Upper Echelons theory by expanding our understanding of the motives of decision-makers to invest in non-financial goals like CSR. Second, it offers cultural ancestry as a potential explanation for different CSR strategies within otherwise similar firms. Although several studies already exist that compare CSR performance between countries, Liang and Renneboog (2017) show that this difference is partly due to the differences in legal climates. Although many studies attempt to control this issue, we build upon their work by eliminating this limitation through our exclusive focus on the US and by distinguishing among various cultures at the CEO ancestry level. Furthermore, by utilizing detailed environmental data rather than relying on aggregated external ESG ratings from rating agencies, this study can more distinctly differentiate between environmental outcomes and intentions.

The remainder of the paper is organized as follows. Section 2 reviews prior literature and develops the research hypotheses. Section 3 details the sample selection process and research methodology. Section 4 presents the empirical results, and section 5 discusses and concludes.

II. LITERATURE & HYPOTHESES DEVELOPMENT

In this section, we will start by discussing motivation and how this is influenced by culture. Next, we will dive deeper into the Upper Echelons theory describing the relationship between personal characteristics and corporate decision-making. A specific personal attribute we will focus on most is cultural background, represented by ancestry. We are particularly interested in corporate decision-making regarding sustainability strategies as these decisions are more challenging due to the complex trade-offs between profit, planet, and people. Finally, we elaborate on the concept of corporate responsibility and discuss why it presents a complex optimization challenge.

Culture's influence on decision making

There are different ways in which motivation can be defined. For example; "motivation refers to processes that instigate and sustain goal-directed activities" (Schunk & DiBenedetto, 2020, p. 1), or "the psychological construct that describes the mechanism by which individuals and groups choose particular behavior and persist with it." (McInerney, 2019, p. 427). Overall, it is clear that motivation is personal and is created as a combination of factors such as goals and self-evaluations of progress, self-efficacy, social comparisons, values, outcome expectations, attributions, and self-regulation (McInerney, 2019). There are two main types of motivation, intrinsic motivation, which refers to doing something because it is inherently interesting or enjoyable, and extrinsic motivation, which refers to doing something because it leads to a separable outcome (Ryan & Deci, 2000).

Edmans et al. (2022a) find intrinsic motivation to be the most important driver of CEO effort, next to personal reputation. Intrinsic motivation is by definition action that is rewarding in itself (Fishbach & Woolley, 2022). Motivation is created among other things if a decision is in line with one's values (Fishbach & Woolley, 2022). The upbringing of an individual significantly influences the formation of these values. Family and community play a pivotal role in shaping a considerable portion of an individual's values, with cultural factors often exerting a significant impact on the values instilled during one's upbringing (Hofstede et al., 2010). Culture, the "beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation" (Guiso et al., 2006, p. 23), is being passed on through generations even after moving to another country (Hofstede et al., 2010).

Culture is not limited to the country where one resides or was born, but can extend to cultural ancestry through family lineage (Barg et al., 2023; Harrison et al., 1998). Cultural

heritage transfers values and beliefs that influence and shape attitudes and are inherent even after generations (Guiso et al., 2006). The impact of deep-level characteristics like ancestry increases over time, while the impact of surface-level characteristics such as age and gender diminishes over time (Harrison et al., 1998). There exists a general agreement within the literature that culture influences corporate decision-making (Griffin et al., 2021; Guiso et al., 2006; Li et al., 2013; Miska et al., 2018; Wang et al., 2021). The Upper Echelons theory supports this notion. Cultural background however affects more than corporate decision-making[2].

The Upper Echelons theory entails that "executives' experiences, values, and personalities greatly influence their interpretations of the situations they face and, in turn, affect their choices" (Hambrick, 2007, p. 1; Hambrick & Mason, 1984). A large body of literature supports this theory. First of all, life experiences affect an individual's decision-making. Malmendier and Nagel (2011) show how living through different economic periods affects investment decisions. Bernile et al. (2017) show that early-life exposure of CEOs to fatal natural disasters influences their corporate risk-taking. A CEO's childhood socioeconomic class influences the company's corporate labor policies (Cronqvist et al., 2019). Even the gender of the children of a CEO influences corporate decision-making (Cronqvist & Yu, 2017). On the work floor, directors learn from environmental engagements (Bauer et al., 2022). Personal experiences influence not only decisions but also performance, for example, of mutual funds managers (Chuprinin & Sosyura, 2016).

Besides experiences, someone's cultural background is covered in the Upper Echelons theory and influences corporate decision-making. Risk-taking is influenced by a country's level of uncertainty aversion, tolerance for hierarchical relationships, and individualism (Mihet, 2012). In her study, Mihet (2012) uses an international sample of 50,000 firms spread across 400 industries in 51 countries. By employing the four original cultural dimensions from Hofstede, the study shows that culture impacts corporate risk-taking directly and not merely through indirect channels such as the legal and regulatory frameworks (Mihet, 2012). Results show that risk-taking, measured by e.g. the standard deviation of ROA or the R&D index, is positively related to uncertainty avoidance, power distance, and individualism. In line with this

[2] That cultural heritage has a strong influence on people's lives can also be seen in different streams of literature, e.g. psychology or health. For example, health outcomes of Latinx immigrants in the US are better than US US-born counterparts (Moise et al., 2019). This effect is explained through physical activity, diet, and sleep hygiene. However, sticking to your cultural heritage and all habits that come with it, could also harm the health of immigrants. Osokpo et al. (2021) find that cultural norms and structural barriers can help to explain the self-care behaviors of African immigrant populations.

study, Li et al. (2013) show how specific economic and psychological channels through three specific cultural values (individualism, uncertainty avoidance, and harmony), influence risky corporate decision-making. Second, they show that when controlling for formal institutions and economic development across countries, these cultural values still matter in corporate risk-taking.

The influence of culture on corporate decision-making stretches beyond borders as a CEO's heritage also influences risk-taking (Pan et al., 2020). Using a sample of CEOs from exclusively US-listed firms, which represent a country of immigrants, they find significant variation in cultural heritage at the family level. In their study, Pan et al. (2020) find that CEOs with a more uncertainty-avoiding cultural heritage are less likely to engage in acquisitions. When acquisitions are made, uncertainty-averse CEOs prefer targets in familiar industries and targets that can be more easily integrated. The results suggest that, through cultural heritage, otherwise unobservable differences between CEOs concerning preferences, traits, or values can be partly observed (Pan et al., 2020).

The Upper Echelons theory expands to the field of corporate social responsibility. When a CEO has a daughter, the CSR rating of the firm is higher, compared to a median firm (Cronqvist & Yu, 2017). The authors explain this relationship by suggesting that women may display stronger other-regarding preferences than men. Additionally, they propose that parents might adopt their children's preferences, influencing their decision-making. Not only CEOs with daughters, but in general married CEOs are associated with significantly higher CSR scores (Hegde & Mishra, 2019). However, they argue that the effect is driven by the normative commitment of marriage which strongly promotes the development of pro-social values, preferences, and behaviors in both men and women.

Also in the domain of corporate social responsibility, cultural heritage has an effect. Wang et al. (2021) study the effect of national culture on corporate green proactivity. As green proactivity goes beyond mere compliance with minimum climate regulations and is more often a long-term strategy for sustainable transformation, aspects like managerial judgment, estimation, and appraisal become more important (Wang et al., 2021). When underlying policies, standards, and norms are ambiguous, which is common in climate-related scenarios, culture matters more (Wang et al., 2021). Therefore, firms' carbon proactivity decisions are inevitably shaped by their specific cultural prescriptions. Their study demonstrates that in a comparison across countries, high levels of masculinity and uncertainty avoidance hinder green proactivity.

Corporate Social Responsibility

Corporate social responsibility (CSR) is rapidly expanding as a research field in academic literature. Also, both institutional and individual investors are increasingly concerned about the sustainability performances of firms. The Friedman doctrine asserts that a firm's sole responsibility is to maximize its profits (Friedman, 2007), is no longer widely accepted. Hart and Zingales (2017) contend that Friedman's separation theory is flawed as investors take externalities into account, and the costs associated with mitigating these externalities may be less for companies than for investors. For example, it is cheaper to reduce plastic waste than to clean it up afterward; or, it is easier to abort the arms supply to Russia than to care for injured Ukrainian soldiers.

By moving away from the Friedman doctrine, we come to the triple bottom-line principle (Elkington, 1998). This principle, introduced by John Elkington, focuses not only on profit but also on the planet and people. The presence of the three different focus elements, leads to a multifaceted optimization problem, as the market does not value all sustainability aspects equally. The trade-off becomes more challenging and less transparent when investors hold varying views on sustainability. This is because the connection between market performance and diverse aspects of sustainability is neither direct nor linear.

From both academic and business viewpoints, the link between financial performance and different dimensions of sustainability is relevant, making it a subject of extensive research (Awaysheh et al., 2020; Barnett & Salomon, 2012; Freiberg et al., 2020; Lopatta et al., 2022; Pástor et al., 2021; Wang et al., 2008). There is a large body of literature that shows that CSR is not necessarily seen as a value-enhancing investment (Edmans, 2011; Flammer, 2013; Harjoto et al., 2017; Krüger et al., 2020). Research shows that a firm's sustainability performance has an insurance-like quality (Flammer, 2013) and thereby protects firms from downside risk while not providing much upside potential. Other studies show that the valuation of sustainability performances exhibits a reverse U-shaped pattern (Harjoto et al., 2017; Lopatta et al., 2022).

According to the survey set out by Krüger et al. (2020), "institutional investors believe climate risks have financial implications for their portfolio firms and that these risks, particularly regulatory risks, already have begun to materialize" (Krüger et al., 2020, p. 1067). To stop or even reverse the negative consequences of climate change, we need the right people in the right places to make the right decisions. Consequently, it is essential to select decision

makers based on their skills and values, who are committed to improving the triple bottom line, instead of purely focusing on maximizing returns.

As cultural values are instilled early in life, they are an even more persistent and essential source of influence than experiences. Given the complexity of decisions related to sustainability, the background of decision-makers becomes even more important. Therefore, we propose that cultural heritage is an important driver for otherwise unobservable differences between corporate decision-makers concerning preferences, values, and as a result, their corporate social responsibility decision-making.

Cultural Dimensions

Prior literature suggests that different dimensions of culture may affect people's decision-making. Over the past years, various methods have been developed to quantify culture and its dimensions. The most widely recognized and utilized is that from Geert Hofstede (2010; 1980). Assisted by others, he identified six fundamental challenges that society must address to organize itself. These challenges are known as the dimensions of every culture. The initial four dimensions, outlined in Hofstede (1980), include 'collectivism versus individualism', 'power distance', 'masculinity versus femininity', and 'uncertainty avoidance'. The final two dimensions, introduced later in Hofstede et al. (2010), encompass 'long-term versus short-term orientation' and 'restraint versus indulgence'.

Although the dimensions from Hofstede are the most widely used method of quantifying culture, there is also criticism of his method. The two main concerns evolve around the time relevance of Hofstede's data and the generalizability. As most of the data was collected between 1968 and 1973, it can be seen as outdated. However, research shows that although culture does change in absolute terms, it does not change significantly in relative terms (Beugelsdijk et al., 2015). In other words, cultures change but cultural differences do not. The second concern stems from the fact that his data is collected in a corporate setting, solely from IBM employees. However, in his paper, Karolyi (2016) does conclude that although there are conceptual and methodological problems " I would be remiss in failing to point to the enormous evidence of the resilience of the scholarly work using these measures" (Karolyi, 2016, p. 615).

The dimension of 'long-term versus short-term orientation' was the first to be introduced following the initial publication of Hofstede's research. The fifth dimension was characterized as follows: "Long-term orientation stands for the fostering of virtues oriented toward future rewards—in particular, perseverance and thrift. Its opposite pole, short-term orientation, stands for the fostering of virtues related to the past and present—in particular, respect for tradition,

preservation of “face,” and fulfilling social obligations” (Hofstede et al., 2010, p. 124). As this dimension gives a clear focus on sustainability by definition, we hypothesize that a high level of long-term orientation positively relates to environmental outcomes. Therefore, our first hypothesis is as follows.

H1: *A high level of long-term orientation positively relates to environmental outcomes.*

Whilst environmental outcomes are measurable outcome variables, intentions are based on plans that are made. This can be in the form of a policy or target for example. As these targets have a more short-term payoff, and as not all targets and policies make it into measurable improvements in outcome variables, we do not expect a relationship between long-term orientation. Therefore, our second hypothesis is as follows.

H2: *A high level of long-term orientation does not relate to environmental intentions.*

Our work enhances the current body of literature by examining one of Hofstede's more recent cultural dimensions, rather than concentrating solely on the original ones. Considering that a culture is comprised of all six dimensions, our approach allows for a fuller understanding of the connection between a specific culture and CSR strategies. Notably, aspects like long-term orientation are crucially relevant to sustainability. Also, as stated in Hofstede et al. (2010), the first four dimensions were rather limited to more Western culture, while the addition of Long-Term Orientation is inspired by Asian influences. Furthermore, by distinguishing between CSR intentions and outcomes, our findings offer a nuanced depiction of the intricacies involved in sustainability strategies.

III. DATA & METHODOLOGY

In this section, we present the data utilized in our analysis. Additionally, we detail the construction of sub-scores for our CSR variables. We also discuss the methodology used for name matching to determine ancestry. Finally, we offer an overview of the firms in our sample, including summary statistics and correlations, to provide insights into their characteristics.

Data description

We focus our analysis on US-listed firms. To examine the relationship between CEO ancestry and CSR, we collect and merge data from several sources. We obtain environmental and social activity and performance information from Refinitiv ESG from 2006 to 2020. It is well known that the ESG ratings from rating agencies like MSCI, FTSE, S&P, Sustainalytics, and Moody's correlate poorly, with correlations ranging from 0.38 to 0.71 (Berg et al., 2022). Furthermore, is it often not clear how well these ratings represent the actual sustainability performance of a firm (Billio et al., 2021). For these reasons, we take a more granular approach to assessing sustainability performance.

Refinitiv ESG data include 131 individual environmental variables. Individual variables for environmental performance include, e.g., 'policy for water efficiency', 'whether the company has an environmental management team', and 'CO2 emissions'. The latter, we include in a robustness analysis. We also collect several governance variables from Refinitiv to control for different board structures that potentially influence the relationship we examine.

Next, we use Execucomp to match the company data with a CEO and for CEO control variables. Finally, we obtain data on other company characteristics from CRSP and Compustat. Appendix Table 1A provides variable definitions. After excluding firms for which either Execucomp or ESG data are missing, the final sample contains 1,491 unique firms and 2,693 CEOs, representing 12,885 firm-year observations.

Corporate Sustainability Scores

From the raw Refinitiv ESG variables, we create sub-scores for environmental outcomes and intentions to get a more granular interpretation. We select relevant environmental variables based on the materiality criteria of the Sustainability Accounting Standards Board (SASB). In some cases, we take the negative value of the variables to ensure that a higher value implies a positive sustainability effect. Next, we group these variables into six categories: policy, reporting, target, activity, performance, and controversy following Bams and Van der Kroft

(2022). We define *Environmental Outcomes* variables as SASB material environmental variables that belong to the categories *performance* or *controversy* and *Environmental Intentions* variables as SASB material environmental variables that belong to the categories *activity*, *policy*, *reporting*, or *target*. We classify sustainability information for each firm in our sample on an annual basis. Appendix Table 2A provides examples of the different categories.

To compute scores for the two sub-dimensions, we apply Wittkowski et al.'s (2003) multi-criteria rank-ordering algorithm. This algorithm applies at the firm-year level and ranks each firm's annual information in one of the two categories relative to all other firm-year information. Comparison hence occurs over firms and years. The algorithm follows a weak dominance principle, i.e., a firm-year is strictly higher in ranking if it scores at least as good as another firm-year on all aspects and strictly better on at least one aspect. A firm-year is strictly lower in ranking if it scores at least strictly worse on one aspect than another and never strictly better. In all other cases, two firm-years are neither superior nor inferior compared to each other. The algorithm accounts for missing observations. In such a case, comparing two firm-years follows from all remaining available variables.[3] Items with more observations are represented more strongly in the data and are therefore more likely to accurately reflect the underlying distribution of the multiple criteria being considered. Through this methodology, these variables will have a slightly stronger weight in the ranking.

The final rank of a firm-year follows from the sum of strictly higher rankings minus the sum of strictly lower rankings. Wittkowski et al. (2003) show that the resulting rankings asymptotically converge to a normal distribution, when the number of firm-years gets large, allowing the ranking to be interpreted as a score. We standardize the rankings on a 0 to 10 scale, where 0 means the firm scores poorly on a particular aspect, and 10 means it scores excellent. The final scores are relative to the entire sample. Although we use industry fixed effects in most analyses, the rankings are defined over the full sample. [4]

Using this algorithm we compute scores for *Environmental Outcomes* and *Environmental Intentions.* This type of distinction is relevant as each of them requires different levels of investment, has a different investment horizon, and has a different sustainability impact. For example, *Environmental Intentions* are relatively cheap to achieve in a short time.

[3]This is one of the aspects of this algorithm that makes this method preferable to others. Especially when using E/S data, there are a considerable number of missing observations. Furthermore, this method does not assume or require any weights being attributed to variables.

[4] By ranking all industries together, we get a better representation of the magnitude of how much 'better' certain firms are.

Their resulting environmental impact is limited. *Environmental Outcomes* are costly and take a long investment horizon. The subsequent environmental impact is high.

CEO Ancestry

To identify a director's ancestry, we build on recent literature that maps a person's surname to the geographic area that most likely represents their country of ancestry (e.g., Brochet et al., 2019; Liu, 2016; Merkeley et al., 2020; Pan et al., 2017, 2020). This method focuses on the transmission of paternal cultural heritage as it is often the father's last name which is passed on to the next generation. Although this is a limitation, research shows that male CEOs reflect their father's cultural heritage while female CEOs are shaped by their mothers' culture (Pan et al., 2020). As our dataset only includes 4% of female CEOs, we exclude them as a robustness test to reduce this limitation. Like genes and culture, surnames are passed on from generation to generation and are informative about a person's ancestry and cultural heritage. We do take into account that cultural influence might weaken after more generations have passed, by controlling for likely immigration year following Pan et al., (2020) and Marra et al. (2023). Also, by matching the cultural heritage of the first name of a CEO, to their last, using the same methodology, we proxy for the involvement with their heritage (next version).

We rely on three reference lists to determine a surname's most likely country of ancestry. Our main reference list builds on historical census records of foreign-born U.S. residents from the Integrated Public Use Microdata Series (IPUMS). We use census records from 1850, 1860, 1870, 1880, 1920, and 1940. These records contain surnames, marital status, and birth countries. We remove married females from these records, as they could have adopted their husbands' surnames. After excluding married females and last names that only occur one or two times, these census records provide 330,685 unique surnames from 78 countries. One limitation of our approach is the representativeness of Asian and Latin Americans in the sample given the period, 1850 to 1940. Therefore we expand our first reference list.

The second reference list we employ contains 20,693 common Asian American surnames from six major Asian American ethnic groups (Chinese, Japanese, Filipino, Korean, Indian, and Vietnamese) developed by Lauderdale and Kestenbaum (2000). This reference list is indeed a good addition for those of Asian descent. The third reference library is the Oxford Dictionary of American Family Names. This dictionary contains regions of origin (sometimes countries, other times broader regions) for close to 70,000 most common American family names. We match directors' surnames with the surnames in the reference lists. This reference

list does not eliminate the limitation for Latino CEOs. However, as reported by Pan et al. (2020), the Institutiona; Shareholder Services' corporate director database shows that among S&P 1500 companies, Latino CEOs account for less than 1.5%.

For the census-based reference list, we obtain the number of surname occurrences and the percentage of that surname coming from each country. If a surname has >100 entries in the census-based reference list and >60% of those come from one country, we assign that country as the most likely country of origin. If not, we cross-check the surname in the other reference lists. If a surname is associated with the same country of origin in two or more reference lists, we take that as the country of origin. If we find no match in the main reference list but have a match in the Asian reference list, we use that as the country of origin. If we only have one entry in one of the reference lists, we use that entry. After matching all surnames for which we have entries in the reference libraries, we cross-check using the Oxford Dictionary of American Family Names to see whether that surname is a common Jewish name. If so, we replace the origin of that surname. Using this procedure, we match 86% of the surnames in the sample and identify 40 countries of ancestry based on the three reference libraries we employ. The CEOs that are left unmatched by a cultural heritage, are individually researched, which brings us to over 98% of CEOs being matched. For companies that had a CEO switch in a given year, the CEO who worked less than 6 months in the firm is excluded from the sample.

Cultural Framework

Next, we use two frameworks for culture. The first proxy is the culture scores from Hofstede (1980, 2010). The first four scores have been constructed using survey data from 117,000 IBM employees in over 70 countries between 1967 and 1973. The last two dimensions were found later and in different studies. They were published in 2010 by Hofstede, Hofstede, and Minkov. Although Hofstede's score is based on survey data from approximately 50 years ago, Beugelsdijk et al. (2015) find that cultural change is absolute rather than relative. In other words, countries' scores on the Hofstede dimensions relative to the scores of other countries have changed little over time, which is important to our study. All cultural dimensions range from 0 to 100 by design.

Countries with a high level are for example for Power Distance Russia and Mexico, for Individualism the USA and Australia, for Masculinity Japan and Hungary, for Uncertainty Avoidance Belgium and Portugal, for Long-Term Orientation Korea or Germany, and Indulgence Mexico and Sweden. Countries with low levels are for example for Power Distance Austria and Denmark, for Individualism Pakistan and Thailand, for Masculinity Sweden and

The Netherlands, for Uncertainty Avoidance Jamaica and Singapore, for Long-Term Orientation Ireland and Iran, and Indulgence Ukraine and China. The dimensions from Hofstede (1980) and Hofstede et al. (2010) will be used for the main analyses.

The second framework is based on survey data from the GLOBE project (House et al., 2004). This framework includes nine different dimensions, which are based on survey data gathered from 17,000 middle managers over 62 different countries. In contrast to Hofstede, the GLOBE project looks both at the values relating to the specific dimension, and the practices. Although one would expect the values and practices of the same dimension to at least be positively correlated, only two out of the nine dimensions have a positive correlation between practices and values, of which one is significant. The GLOBE framework will be used for robustness analyses in this study.

Descriptives

Following Griffin et al. (2021) we control for firm value using a book-to-market ratio and return on assets (ROA). Furthermore, we control for the firm-level characteristics size (Market Value of Equity) and return on equity (ROE). Next, we include control variables for the board composition and include the size (board size), CEO duality (CEO duality), and the percentage of non-executive board members in the board (nonexec). Lastly, we control for CEO characteristics age and gender.

Table 1 provides the descriptive statistics for the CSR variables, long-term orientation, and control variables. All CSR variables range from 0 to 10 by design. The constructed CSR variables show significant dispersion, which suggests substantial cross-sectional variation in CSR activities at the firm level. As we do not have all countries represented in our sample that are included in the study by Hofstede et al. (2010), not all dimensions in the sample range from 0 to 100. Long-term orientation has a good spread between 12 and 100. The companies in the sample are, on average, larger than the average firm in the market. This is due to the selection effect of reporting/being reported on by Refinitiv. The board characteristics of our sample are representative of the average size firm in the sample. The average CEO age in the sample is 57, and 96% of the CEOs are male.

Table 2 shows the correlations. Notable is the negative correlation between Environmental Outcomes and Environmental Intentions. The negative correlation between environmental outcomes and CO2 emissions makes sense, as the environmental outcomes are positively coded, more is better, whereas CO2 emissions are the opposite.

Furthermore, we see purely positive correlations between Long-Term Orientation and the CSR variables. Lastly, larger firms on average perform better on Intentions than they do on Outcomes.

IV. RESULTS

In this section, we present our main findings, examining the relationship between cultural ancestry and environmental outcomes and intentions.

CEO Ancestry

First, we examine the relationship between CEO ancestry and CSR performance. To do this, we estimate the following model for the full sample.

$$CSR_{it} = \beta_0 + \beta_1 Ancestry_{i,t-1} + \gamma' Controls_{i,t-1} + D_t + F_i + \varepsilon_{it} \quad (1)$$

The dependent variable (CSR_{it})Equation (1) is one of the following: Environmental Outcomes and *Environmental Intentions*. To control for endogeneity, the regression equation uses one-year lagged explanatory variables as well as a two-year lag in the robustness analysis. Therefore, $Controls_{i,t-1}$ is the vector of lagged control variables, D_t denotes the year fixed effect for year *t* and F_i the industry fixed effect for firm *i*. The variable *Ancestry* reflects the level of the cultural dimension Long-Term Orientation from Hofstede (Hofstede et al., 2010). As control variables, we include firm size (*lnMVE)* as the log market value of equity, profitability using return on equity (*roe*) and return on assets (*ROA*), and growth potential as the book-to-market ratio (*BM*). The company control variables are winsorized at the 1st and 99th percentile. Concerning CEO characteristics, we include age and gender. We control for board structure using *board_size*, board independence (percentage of non-executive board members, *nonexec*), and CEO power (*ceo_duality*). In addition, we include year and industry fixed effects to control for environmental scores development over time, and for differences between industries. All standard errors are clustered at the firm level.

Table 3 documents the results of these analyses. In the first and second models, only the predicting variable long-term orientation, and year and industry fixed effects are included. In models three and four, all control variables are added. Although the coefficient for environmental outcomes becomes smaller, the results do not change much after the control variables are added. Long-Term Orientation is positively related to environmental outcomes.

Therefore, hypothesis 1 can be confirmed. On the contrary, long-term orientation is not related to environmental intentions which confirms hypothesis 2.

As a robustness analysis, we replace the environmental outcomes score with one of the environmental variables in the dataset. The variable CO2 emissions represent the total CO2 and CO2 equivalents emissions in tonnes divided by net sales or revenue in US dollars in millions. The coverage of this variable is about 40% of the total sample. Because of the overall poor coverage of environmental performances, we choose to work with self-aggregated scores. However, as CO2 emissions is one of the, if not the most, important aspect of environmental sustainability, we run the same regression on a smaller sample that reports on CO2 emissions. Equation 1 is also used for this analysis, but as a CSR variable CO2 emissions are used.

Table 4 documents these results. In the first model again, only the year and industry fixed effects, together with the predicting variable long-term orientation are included. In model two, all other control variables are added. By adding the control variables, the size of the coefficient increases, and the significant level increases to $p<0.050$. The coefficient is negative as a higher level of long-term orientation leads to a decrease in CO2 emissions and thereby to better environmental performances.

Endogeneity

As culture and finance research is subject to endogeneity concerns, we expand the analyses using an instrumental variable for long-term orientation in our analyses. A quality instrument ought to demonstrate a robust correlation with national cultural indicators, meeting both statistical and theoretical criteria (relevance condition). Additionally, it should solely impact CSR performance through cultural factors (exclusion condition), necessitating its independence from the error term.

For long-term orientation, we use a language-based instrumental variable introduced by Chen (2013) as a predictor of economic outcomes. Saussure, credited as the progenitor of both structural linguistics and semiotics, described reality as an 'unstructured phenomenon' that undergoes discretization and organization through language, stating: “If words stood for pre-existing entities they would all have exact equivalents in meaning from one language to the next, but this is not true” (Saussure, 1916). Chen uses future-time reference as a difference between languages and thereby countries. Some languages like English need to mark future events in a grammatical way by using a future tense, whereas a language like German does not. His hypothesis states that by not separating current and future events grammatically, the future

might feel less distant. Therefore, we predict future-time referencing to be negatively related to long-term orientation.

The preceding discussion argues in favor of our instruments meeting the relevance criteria. Moreover, we contend they also meet the exclusion criteria, given that language is not likely directly linked to CSR performance apart from through culture. Especially since, in the work environment, all CEOs will be speaking English at least the majority of the time. Furthermore, considering CSR performance's improbable impact on language, our instruments can be legitimately regarded as exogenous.

As the instrumental variable we employ the future-time reference (FTR) in a prediction context as it has no intentional component, it cannot be influenced. The data from Chen (2013) includes a web scraping for full-sentence weather forecasts. By focussing on weather reports only, it creates a controlled set of texts on future events. The variable for future-time reference in a prediction context is a dummy variable with 1 showing strong future-time reference and 0 showing weak future-time reference. Only Belgium and Switzerland have a value between 0 and 1, as they have more primary languages, dependent on the region.

The correlation between long-term orientation and future-time reference is -0.78. This is in line with the literature as a future-time reference should increase the cognitive distance between the present and the future, and thereby make people more short-term oriented. Table 5 presents the instrumental variable regression results. Panel A reports the result of the first-stage regression which shows that countries with strong FTR score lower on long-term orientation (Model 1). Panel B reports the results of the second-stage regressions. In Model (2), we find that the coefficient on long-term orientation is significant at the 1% level. In Model (3), in line with expectations, we find no relationship. The previous result on the relationship between long-term orientation and environmental outcomes thus continues to go through.

Additional test

Lastly, we want to test whether outcomes are preceded by intentions as one would expect. However, the nonresult for the relationship between long-term orientation and environmental intentions already gives the notion of a non-existent or weak relationship between environmental intentions and outcomes. Therefore, as a separate analysis, we test with both a one-year and two-year lag of environmental intentions, if they have predicting power over environmental outcomes. For this, we employ a similar model as for the previous analyses.

$$EnvOut_{it} = \beta_0 + \beta_1 EnvInt_{i,t-1} + \gamma' Controls_{i,t-1} + D_t + F_i + \varepsilon_{it} \quad (2)$$

The dependent variable environmental outcomes in Equation (2) is predicted by either one-year or two-year lagged environmental intentions. Also, $Controls_{i,t-1}$ is the vector of lagged control variables, D_t denotes the year fixed effect for year *t* and F_i the industry fixed effect for firm i. The model again uses robust standard errors clustered on the firm level.

Table 6 documents the results of these analyses. There is a small negative coefficient in Model (1) and a slightly bigger one in Model (2). However, both models show a nonresult. Therefore, we can conclude that environmental intentions have no predicting qualities over environmental outcomes.

V. CONCLUSION

This study examines the relationship between CEO cultural ancestry and a firm's sustainability strategy. We find that CEOs who originate from a more long-term orientated culture, perform better on environmental outcomes. This is robust for exchanging environmental outcomes for CO2 emissions. Also, employing the instrumental variable of future-time reference in language, we confirm the earlier results.

This study contributes to several fields of research. First, it contributes to the cultural finance literature by showing that also for non-financial goals, the cultural background is a predictable variable for decision-making and strategies. Therefore, the Upper Echelons Theory expands to a triple-bottom-line view of corporate finance. More directly, we build upon the research by Miska et al. (2018) by taking a within-country view and thereby eliminating a lot of external factors mentioned by Liang and Renneboog (2017). Furthermore, we build on the study by Griffin et al. (2021) by expanding beyond individualism when looking at the relationship between culture and sustainability.

Second, this research contributes to the sustainability and CSR literature examining the strategies of firms. By using a more granular approach of a firm's sustainability performance, we can better differentiate between the different types of sustainability performance. Especially considering the relatively strong negative correlations between environmental intentions and outcomes.

From a management perspective, as sustainability efforts have become a significant aspect of a corporation, the proper strategy to integrate financial and sustainability performance critically depends on decision-making in the board. A better understanding of the underlying

motivations for enhancing sustainability based on cultural characteristics improves the selection process for decision-makers within a firm. As sustainability becomes more of a standard nowadays, we investigate alternative strategies that combine environmental, and financial performances.

REFERENCES

Awaysheh, A., Heron, R. A., Perry, T., & Wilson, J. I. (2020). On the relation between corporate social responsibility and financial performance. *Strategic Management Journal*, *41*(6), 965–987. https://doi.org/10.1002/smj.3122

Barg, J. A., Drobetz, W., El Ghoul, S., Guedhami, O., & Schröder, H. (2023). Board Ancestral Diversity and Voluntary Greenhouse Gas Emission Disclosure. *British Journal of Management*, *n/a*(n/a). https://doi.org/10.1111/1467-8551.12778

Bauer, R., Derwall, J., & Tissen, C. (2022). *Corporate Directors Learn From Environmental Shareholder Engagements* (SSRN Scholarly Paper 3981634). Social Science Research Network. https://doi.org/10.2139/ssrn.3981634

Berg, F., Kölbel, J. F., & Rigobon, R. (2022). Aggregate Confusion: The Divergence of ESG Ratings*. *Review of Finance*, *26*(6), 1315–1344. https://doi.org/10.1093/rof/rfac033

Bernile, G., Bhagwat, V., & Rau, P. R. (2017). What Doesn't Kill You Will Only Make You More Risk-Loving: Early-Life Disasters and CEO Behavior. *The Journal of Finance*, *72*(1), 167–206. https://doi.org/10.1111/jofi.12432

Beugelsdijk, S., Maseland, R., & van Hoorn, A. (2015). Are Scores on Hofstede's Dimensions of National Culture Stable over Time? A Cohort Analysis. *Global Strategy Journal*, *5*(3), 223–240. https://doi.org/10.1002/gsj.1098

Billio, M., Costola, M., Hristova, I., Latino, C., & Pelizzon, L. (2021). Inside the ESG ratings: (Dis)agreement and performance. *Corporate Social Responsibility and Environmental Management*, *28*(5), 1426–1445. https://doi.org/10.1002/csr.2177

Brochet, F., Miller, G. S., Naranjo, P., & Yu, G. (2019). Managers' Cultural Background and Disclosure Attributes. *The Accounting Review*, *94*(3), 57–86. https://doi.org/10.2308/accr-52290

Causes of climate change—European Commission. (n.d.). Retrieved 20 January 2024, from https://climate.ec.europa.eu/climate-change/causes-climate-change_en

Chen, M. K. (2013). The Effect of Language on Economic Behavior: Evidence from Savings Rates, Health Behaviors, and Retirement Assets. *American Economic Review*, *103*(2), 690–731. https://doi.org/10.1257/aer.103.2.690

Chuprinin, O., & Sosyura, D. (2016). *Family Descent as a Signal of Managerial Quality: Evidence from Mutual Funds* (w22517; p. w22517). National Bureau of Economic Research. https://doi.org/10.3386/w22517

Consequences of climate change—European Commission. (n.d.). Retrieved 20 January 2024, from https://climate.ec.europa.eu/climate-change/consequences-climate-change_en

Cook, D., Hewitt, D., & Milner, J. (1972). Uses of the Surname in Epidemiologic Research. *American Journal of Epidemiology*, *95*(1), 38–45. https://doi.org/10.1093/oxfordjournals.aje.a121367

Cronqvist, H., Hutton, I., & Jiang, D. (2019). *Working Class CEOs: Formation of Occupational Norms and Corporate Labor Policies* (SSRN Scholarly Paper ID 3501928). Social Science Research Network. https://doi.org/10.2139/ssrn.3501928

Cronqvist, H., & Yu, F. (2017). *Shaped by their daughters: Executives, female socialization, and corporate social responsibility | Elsevier Enhanced Reader*. https://doi.org/10.1016/j.jfineco.2017.09.003

Edmans, A. (2011). Does the stock market fully value intangibles? Employee satisfaction and equity prices. Journal of Financial Economics, 101(3), 621–640. https://doi.org/10.1016/j.jfineco.2011.03.021

Edmans, A., Gosling, T., & Jenter, D. (2022a). *CEO Compensation: Evidence From the Field* (SSRN Scholarly Paper 3877391). https://doi.org/10.2139/ssrn.3877391

Edmans, A., Levit, D., & Schneemeier, J. (2022b). *Socially Responsible Divestment* (SSRN Scholarly Paper 4093518). https://doi.org/10.2139/ssrn.4093518

Elkington, J. (1998). *Cannibals with forks: The triple bottom line of 21st century business*. New Society Publishers.

Fishbach, A., & Woolley, K. (2022). The Structure of Intrinsic Motivation. *Annual Review of Organizational Psychology and Organizational Behavior*, *9*(1), 339–363. https://doi.org/10.1146/annurev-orgpsych-012420-091122

Flammer, C. (2013). Corporate Social Responsibility and Shareholder Reaction: The Environmental Awareness of Investors. *The Academy of Management Journal*, *56*(3), 758–781. https://doi.org/10.5465/amj.2011.0744

Friedman, M. (2007). The Social Responsibility of Business Is to Increase Its Profits. In W. C. Zimmerli, M. Holzinger, & K. Richter (Eds.), *Corporate Ethics and Corporate Governance* (pp. 173–178). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-540-70818-6_14

Griffin, D., Guedhami, O., Li, K., & Lu, G. (2021). National Culture and the Value Implications of Corporate Environmental and Social Performance. *Journal of Corporate Finance*, *71*, 102123. https://doi.org/10.1016/j.jcorpfin.2021.102123

Guiso, L., Sapienza, P., & Zingales, L. (2006). Does Culture Affect Economic Outcomes? *Journal of Economic Perspectives*, *20*(2), 23–48. https://doi.org/10.1257/jep.20.2.23

Hambrick, D. C. (2007). Upper Echelons Theory: An Update. *The Academy of Management Review*, *32*(2), 334–343. https://doi.org/10.2307/20159303

Hambrick, D. C., & Mason, P. A. (1984). Upper Echelons: The Organization as a Reflection of Its Top Managers. *The Academy of Management Review*, *9*(2), 193–206. https://doi.org/10.2307/258434

Harjoto, M., Jo, H., & Kim, Y. (2017). Is Institutional Ownership Related to Corporate Social Responsibility? The Nonlinear Relation and Its Implication for Stock Return Volatility. *Journal of Business Ethics*, *146*(1), 77–109. https://doi.org/10.1007/s10551-015-2883-y

Harrison, D. A., Price, K. H., & Bell, M. P. (1998). Beyond Relational Demography: Time and the Effects of Surface- and Deep-Level Diversity on Work Group Cohesion. *The Academy of Management Journal*, *41*(1), 96–107. https://doi.org/10.2307/256901

Hart, O., & Zingales, L. (2017). Companies Should Maximize Shareholder Welfare Not Market Value. *Journal of Law, Finance, and Accounting*, *2*(2), 247–275. https://doi.org/10.1561/108.00000022

Hegde, S., & Mishra, D. R. (2019). Married CEOs and Corporate Social Responsibility. *SRPN: Corporate Social Responsibility Issues (Topic)*. https://doi.org/10.2139/ssrn.3055306

Hofstede, G. (2001). Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations. *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations*. https://doi.org/10.1016/S0005-7967(02)00184-5

Hofstede, G. H. (1980). *Culture's consequences: International differences in work-related values*. Sage Publications.

Hofstede, Hofstede, G. J., & Minkov, M. (2010). *Cultures and organizations: Software of the mind: intercultural cooperation and its importance for survival* (3rd ed). McGraw-Hill.

Karolyi, G. A. (2016). The gravity of culture for finance. *Journal of Corporate Finance*, *41*, 610–625. https://doi.org/10.1016/j.jcorpfin.2016.07.003

Krüger, P., Sautner, Z., & Starks, L. T. (2020). The Importance of Climate Risks for Institutional Investors. *The Review of Financial Studies*, *33*(3), 1067–1111. https://doi.org/10.1093/rfs/hhz137

Lai, E. (2011). Motivation: A literature review. *Person Research's Report*, *6*, *40–41*.

Larrick, R. P. (1993). Motivational factors in decision theories: The role of self-protection. *Psychological Bulletin*, *113*(3), 440–450. https://doi.org/10.1037/0033-2909.113.3.440

Li, K., Griffin, D., Yue, H., & Zhao, L. (2013). How does culture influence corporate risk-taking? *Journal of Corporate Finance*, *23*, 1–22. https://doi.org/10.1016/j.jcorpfin.2013.07.008

Liang, H., & Renneboog, L. (2017). On the Foundations of Corporate Social Responsibility. *The Journal of Finance*, *72*(2), 853–910. https://doi.org/10.1111/jofi.12487

Liu, X. (2016). Corruption culture and corporate misconduct. *Journal of Financial Economics*, *122*(2), 307–327. https://doi.org/10.1016/j.jfineco.2016.06.005

Luo, L. L., & Tang, Q. (2016a). Does National Culture Influence Corporate Carbon Disclosure Propensity? *Journal of International Accounting Research*, *15*(1), 17–47. https://doi.org/10.2308/jiar-51131

Malmendier, U., & Nagel, S. (2011). Depression Babies: Do Macroeconomic Experiences Affect Risk Taking?*. *The Quarterly Journal of Economics*, *126*(1), 373–416. https://doi.org/10.1093/qje/qjq004

Marra, M., Petmezas, D., Ruan, J., & Yin, C. (2023). *The Impact of CEO Ethnic Cultural Identity: Evidence from Cross-Border Acquisitions* (SSRN Scholarly Paper 4343330). https://doi.org/10.2139/ssrn.4343330

Mateos, P. (2007). A review of name-based ethnicity classification methods and their potential in population studies. *Population, Space and Place*, *13*(4), 243–263. https://doi.org/10.1002/psp.457

McInerney, D. (2019). Motivation. *Educational Psychology*, *39*, 427–429. https://doi.org/10.1080/01443410.2019.1600774

Mihet, R. (2012). Effects of Culture on Firm Risk-Taking: A Cross-Country and Cross-Industry Analysis. *Journal of Cultural Economics*, *37*. https://doi.org/10.1007/s10824-012-9186-2

Miska, C., Szőcs, I., & Schiffinger, M. (2018). Culture's effects on corporate sustainability practices: A multi-domain and multi-level view. *Journal of World Business*, *53*(2), 263–279. https://doi.org/10.1016/j.jwb.2017.12.001

Moise, R. K., Meca, A., Schwartz, S. J., Unger, J. B., Lorenzo-Blanco, E. I., Ángel Cano, M., Szapocznik, J., Piña-Watson, B., Des Rosiers, S. E., Baezconde-Garbanati, L., Soto, D. W., Pattarroyo, M., Villamar, J. A., & Lizzi, K. M. (2019). The use of cultural identity in predicting health lifestyle behaviors in Latinx immigrant adolescents. *Cultural Diversity and Ethnic Minority Psychology*, *25*(3), 371–378. https://doi.org/10.1037/cdp0000229

Osokpo, O., James, R., & Riegel, B. (2021). Maintaining cultural identity: A systematic mixed studies review of cultural influences on the self-care of African immigrants living with non-communicable disease. *Journal of Advanced Nursing*, *77*(9), 3600–3617. https://doi.org/10.1111/jan.14804

Osterloh, M., Frey, B., & Frost, J. (2001). Managing Motivation, Organization and Governance. *Journal of Management and Governance*, *5*, 231–239. https://doi.org/10.1023/A:1014084019816

Pan, Y., Siegel, S., & Wang, T. Y. (2017). Corporate Risk Culture. *Journal of Financial and Quantitative Analysis*, *52*(6), 2327–2367. https://doi.org/10.1017/S0022109017000771

Pan, Y., Siegel, S., & Yue Wang, T. (2020). The Cultural Origin of CEOs' Attitudes toward Uncertainty: Evidence from Corporate Acquisitions. *The Review of Financial Studies*, *33*(7), 2977–3030. https://doi.org/10.1093/rfs/hhz109

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. *Contemporary Educational Psychology*, *25*(1), 54–67. https://doi.org/10.1006/ceps.1999.1020

Saussure, F. (1916). *Course in General Linguistics*.

Schunk, D. H., & DiBenedetto, M. K. (2020). Motivation and social cognitive theory. *Contemporary Educational Psychology*, *60*, 101832. https://doi.org/10.1016/j.cedpsych.2019.101832

Wang, H., Guo, T., & Tang, Q. (2021). The effect of national culture on corporate green proactivity. *Journal of Business Research*, *131*, 140–150. https://doi.org/10.1016/j.jbusres.2021.03.023

Wittkowski, K. M. (2003). Novel Methods for Multivariate Ordinal Data applied to Genetic Diplotypes, Genomic Pathways, Risk Profiles, and Pattern Similarity. *University Library of Munich, Germany, MPRA Paper*, *35*.

TABLES

Table 1
Descriptive statistics.

	N	Mean	Std. Dev.	Min	Max	p25	Median	p75
CSR Variables								
E outcomes	12885	5.404	2.64	0.005	9.786	3.157	5.784	7.644
E intentions	12885	4.858	1.817	0.685	8.017	3.453	5.294	6.306
CO2 emissions	4635	524.391	1401.886	0	14280.36	15.9445	45.21641	261.8415
Culture Variable								
Long-Term Orientation	12678	51.231	23.143	12	100	24	51	83
Control Variables								
lnMVE	12879	8.563	1.51	1.235	14.212	7.548	8.443	9.532
book/market	12885	0.549	0.627	0	20.333	0.235	0.424	0.72
roa	12885	0.13	0.109	-1.17	1.336	0.074	0.123	0.178
roe	12885	0.132	0.488	-16.919	21.188	0.052	0.111	0.192
boardsize	12885	10.07	2.498	0	35	8	10	12
nonexec	12885	83.65	9.63	0	100	80	85.714	90.909
ceo duality	12885	0.652	0.476	0	1	0	1	1
age	12862	57.165	6.789	28	90	53	57	61
gender	12885	0.043	0.203	0	1	0	0	0

Note: This table provides descriptive statistics for the variables used in the analysis over the sample period. The sample consists of 12 885 observations, of which all information is available, over fiscal years 2006 to 2002. The observations are yearly. The sample contains 1,491 unique firms and 2693 CEOs. The Culture Variable Long-Ter Orientation are taken from the Hofstede Six Cultural Dimensions. All company control variables are winsorised on the 1st and 99th percentile. The variable gender is coded that 0=male and 1=female. All variables are defined in the Appendix in Table 1A.

Table 2
Pearson correlation.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
(1) E outcomes	1												
(2) E intentions	-0.401*	1											
(3) CO2 emissions	-0.415*	-0.227*	1										
(4) Long-Term Orien.	0.049*	0.012	-0.067*	1									
(5) lnMVE	-0.505*	0.328*	-0.097*	-0.042*	1								
(6) bm	-0.047*	0.027*	0.203*	-0.028*	-0.213*	1							
(7) roe	-0.057*	0.059*	-0.089*	0.006	0.169*	-0.143*	1						
(8) roa	-0.140*	0.075*	-0.152*	-0.011	0.200*	-0.294*	0.372*	1					
(9) board size	-0.268*	0.165*	0.038*	-0.043*	0.446*	0.050*	0.050*	-0.083*	1				
(10) nonexec board	-0.207*	0.139*	0.064*	-0.050*	0.224*	0.02	0.040*	-0.033*	0.315*	1			
(11) ceo duality	-0.137*	0.056*	-0.011	-0.018	0.158*	-0.033*	0.045*	0.048*	0.124*	0.085*	1		
(12) age	-0.018	-0.023*	0.005	-0.017	0.006	0.049*	0.018	-0.025*	0.041*	-0.016	0.135*	1	
(13) gender	-0.024*	0.033*	0.029	-0.002	0.014	-0.006	-0.003	-0.011	0	-0.007	-0.064*	-0.039*	1

Note: This table reports the Pearson correlation among variables for the 12 885 observations over fiscal years 2006 to 2020. The '*' indicates significance level at 1%.

Table 3
Regression of relationship between Culture and CSR performances.

	(1) E outcomes	(2) E intentions	(3) E outcomes	(4) E intentions
Long-Term Orien.	0.008***	-0.000	0.005***	0.001
	(0.002)	(0.002)	(0.002)	(0.001)
lnMVE			-0.959***	0.474***
			(0.033)	(0.029)
book/market			-1.369***	0.484***
			(0.135)	(0.097)
roe			0.470***	0.017
			(0.175)	(0.149)
roa			-0.783	0.063
			(0.563)	(0.450)
age			-0.010*	-0.011**
			(0.006)	(0.005)
gender			-0.058	0.013
			(0.207)	(0.160)
boardsize			-0.040*	0.014
			(0.024)	(0.017)
nonexec			-0.013***	0.003
			(0.004)	(0.003)
ceo duality			-0.114	0.066
			(0.089)	(0.070)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Observations	11,270	11,270	11,240	11,240
R-squared	0.291	0.118	0.568	0.264

Note: This table documents the regression results of the relationship between CEO Long-Term Orientation and Corporate Social Responsibility (CSR). The dependent variable in each regression is a different CSR performance measure. The independent variables, together with the control variables are lagged by one year. The superscripts *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-tailed test). The model uses robust standard errors clustered on firm level.

Table 4
Regression of relationship between culture and CO2 emissions.

	(1) CO2 Emissions	(2) CO2 Emissions
Long-Term Orien.	-3.637*	-4.159**
	(2.060)	(2.111)
lnMVE		-77.966***
		(30.089)
book/market		986.006***
		(188.487)
roe		259.410**
		(123.067)
roa		-679.736
		(460.788)
age		4.189
		(4.207)
gender		75.112
		(204.180)
boardsize		49.766**
		(20.687)
nonexec		2.865
		(3.217)
ceo duality		62.911
		(107.670)
Year FE	Yes	Yes
Industry FE	Yes	Yes
Observations	4,405	4,396
R-squared	0.218	0.303

Note: This table documents the regression results of the relationship between CEO Long-Term Orientation and CO2 emissions. The independent variables, together with the control variables are lagged by one year. The superscripts *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-tailed test). The model uses robust standard errors clustered on firm level.

Table 5
Instrumental variable regressions of culture on CSR.

	(1) Long-Term Orien.	(2) E outcomes	(3) E intentions
Panel A.			
Future Referencing	-39.063***		
	(0.715)		
Other controls	Yes		
Panel B.			
Predicted LTO		0.006***	0.000
		(0.002)	(0.002)
lnMVE		-0.961***	0.466***
		(0.034)	(0.029)
book/market		-1.386***	0.466***
		(0.138)	(0.100)
roe		0.473***	0.039
		(0.178)	(0.154)
roa		-0.798	-0.019
		(0.568)	(0.462)
age		-0.010	-0.010**
		(0.006)	(0.005)
gender		-0.107	0.053
		(0.216)	(0.163)
boardsize		-0.040	0.017
		(0.024)	(0.018)
nonexec		-0.013***	0.003
		(0.004)	(0.003)
ceo duality		-0.126	0.070
		(0.091)	(0.072)
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Observations	10,773	10,773	10,773

Note: This table documents the two-stage least squares regression. The independent variables, together with the control variables are lagged by one year. The superscripts *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-tailed test). The model uses robust standard errors clustered on firm level.

Table 6
Regression intentions and outcomes.

	(1) E outcomes	(2) E outcomes
E intentions lag1	-0.004	
	(0.013)	
E intentions lag2		-0.009
		(0.011)
lnMVE	-0.397***	-0.366***
	(0.046)	(0.048)
book/market	-0.364***	-0.332***
	(0.057)	(0.061)
roe	0.194***	0.207***
	(0.053)	(0.060)
roa	-0.092	-0.166
	(0.228)	(0.255)
age	-0.002	-0.004
	(0.003)	(0.003)
gender	0.206**	0.208**
	(0.070)	(0.076)
boardsize	-0.020***	-0.022**
	(0.007)	(0.008)
nonexec	0.003**	0.004***
	(0.001)	(0.001)
ceo duality	0.054	0.042
	(0.047)	(0.046)
Year FE	Yes	Yes
Firm FE	Yes	Yes
Observations	133,052	116,343
R-squared	0.954	0.958

Note: This table documents the regression results of the relationship between environmental intentions and outcomes. In this model, we use firm-fixed effects instead of industry-fixed effects to get a within-firm perspective. The intentions variables, together with all control variables, are lagged both by one and two years. The superscripts *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-tailed test). The model uses robust standard errors clustered on firm level.