Master Thesis U.S.E

Towards Sustainable Business Practices: Exploring the Interplay of Long-Term Orientation, Entrepreneurial Orientation and Corporate Environmental Performance[1]

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Abstract

This thesis investigates the relationship between entrepreneurship and sustainability. The study explores the types of entrepreneurial activity that can effectively reconcile conflicting priorities inherent in business sustainability. It proposes long-term orientation (LTO) to promote corporate environmental performance (CEP). Based on stakeholder theory, the study examines the influence of entrepreneurial orientation (EO) and long-term orientation (LTO) on the ESG scores of S&P 500 companies. Employing panel data analysis using random effects model the findings indicate that EO alone does not exhibit a significant relationship with ESG scores. Surprisingly, LTO revealed a negative relationship with ESG scores. However, the interaction of EO and LTO positively affects ESG scores, highlighting their complementary nature. The results stress the need for firms to consider other factors, such as LTO, to promote long-term sustainability goals and drive sustainable business practices. This research expands the theoretical understanding of the relationship between entrepreneurship and sustainability and provides insights for managerial decision-making to enhance corporate environmental performance.

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Introduction

In recent decades, the concept of sustainability has gained significant prominence, emerging as a global concern. Awareness about the sustainability of our planet and the impact of human activity on the environment has become increasingly evident (Epstein & Buhovac, 2014). This is reflected in the executive order signed by President Biden in 2021 on "Tackling the Climate Crisis at Home and Aboard," which aims to address environmental issues through the implementation of sustainable policies and actions (House, 2021). In this context, businesses play a crucial role in addressing environmental challenges, given their substantial impact on natural resources, pollution, and greenhouse gas emissions (Porter & Kramer, 2019). In fact, about half of the world's CEOs believe that climate change is already affecting their business operations or will in the next five years (World Economic Forum Report, 2022). The perception that a fundamental change is required to reduce the impact of unsustainable business practices is growing (Hall et al., 2010). Increasingly, business scholars and practitioners alike acknowledge that addressing today's grand societal challenges requires an entrepreneurial response. Entrepreneurship has been identified as the driving force behind addressing social and environmental issues (Hall et al., 2010; Muñoz & Cohen, 2018). However, not all forms of it leads to the adoption of sustainable business practices.

Although there is growing pressure on companies to address environmental concerns, many prioritize immediate profits over long-term benefits. This is due to the perception that the adoption of sustainable practices entails short-term expenses and uncertain long-term benefits. Consequently, the environment faces detrimental effects. The conflict between short- and long-term benefits is inherent in business sustainability (Slawinski & Bansal, 2015). Traditionally, it was believed that environmental preservation was incompatible with profit-driven entrepreneurship. Contrary to this assumption, a lot of scholars supported the "Porter Hypothesis", which suggests that environmental regulations can trigger innovation and productivity in a way that offsets the costs of compliance (Lanoie et al., 2011; Rubashkina et al., 2015; van Leeuwen & Mohnen, 2017; Y. Wang et al., 2019). Furthermore, the fact that managers and CEOs are under "myopic behavior" driven by pressures from shareholders to maximize short-term profitability, further exacerbates the tensions between entrepreneurship and sustainability (Brochet et al., 2015; Y.-F. Chen et al., 2015; Zhang & Gimeno, 2016). However, a growing body of research indicates that sustainability-focused stakeholders are increasingly advocating for and pressuring firms to adopt responsible and sustainable business practices (Baah et al., 2021; Meixell & Luoma, 2015; Ramanathan et al., 2014; Rudyanto & Veronica Siregar, 2018). Despite the potential of entrepreneurship to drive sustainable development, these complex dynamics highlight the need for further exploration of what kinds of entrepreneurship can effectively reconcile these conflicting priorities.

Regardless of the growing public awareness and the pressures from stakeholders, there is still a doubt that many firms are not taking sufficient actions to deal with environmental issues (Hashmi et al., 2015; Veleva et al., 2017). This concern is critical and must be addressed to mitigate the harmful effects of short-term behavior by firms on the environment while contributing to UN's Sustainable Development Goals. The "Panacea Hypothesis", which supports that entrepreneurship is the transformational force behind sustainable development, has been the topic of highly influential journals such as the *Harvard Business Review* and the

MIT Management Review (Brugmann & Prahalad, 2007; Senge et al., 2007). To manage these tensions and address the concern of insufficient actions, scholars have suggested that firms adopt a long-term orientation. A long-term perspective implies the ability to look beyond short-term profitability and focus on long-term benefits. To address the insufficient actions by firms, a better understanding of the relationship between entrepreneurship, long-term orientation, and business sustainability is required. Current literature includes inadequacies, as these relationships have been studied separately (Ahmed et al., 2020; Flammer & Bansal, 2017; Khalid et al., 2020; Rosenbusch et al., 2013; Silva et al., 2021; T. Wang & Bansal, 2012). This research aims to fill the gaps in the literature by investigating the types of entrepreneurial activity that can promote sustainable business practices and effectively manage tensions among stakeholders. Therefore, the research question of this study is: How does long-term orientation moderate the relationship between entrepreneurship and sustainability to promote sustainable business practices? This examination aims to provide insight into how firms can balance their entrepreneurial level with long-term sustainability goals to improve their corporate environmental performance.

This study aims to investigate the relationship between entrepreneurship, long-term orientation, and corporate environmental performance (CEP) among firms. Specifically, the relationship between entrepreneurial orientation (EO), long-term orientation (LTO), and their impact on the ESG scores of S&P 500 companies. To promote sustainable business practices, it is crucial to delve into the specifics of the relationship between EO and CEP, which is why we consider the potential interaction effect of LTO. We build on stakeholder theory to propose our hypotheses. Stakeholder theory suggests that businesses have a social responsibility to manage their operations in a way that benefits all stakeholders, not just shareholders (Freeman et al., 2010). The adoption of sustainable business practices by firms is reportedly under significant pressure from stakeholders, who increasingly value sustainability (Darnall et al., 2010; Rudyanto & Veronica Siregar, 2018; Sarkis et al., 2010). Consequently, we hypothesize that both EO and LTO will positively influence CEP. The innovative nature of EO makes it well-suited for driving environmental performance, while its proactive dimension enables effective identification and responsiveness towards stakeholder demands. Additionally, LTO firms prioritize long-term benefits, such as investing in environmentally friendly initiatives, which are also in line with sustainability-focused stakeholders. Moreover, we hypothesize that LTO will positively moderate the relationship between EO and CEP due to the alignment of firm practices, stakeholder demands, and sustainability goals.

To test the proposed hypotheses, we use a (moderated) multiple regression analysis with three random effects models while controlling for firm-specific characteristics. The dataset includes archival data from letters to shareholders of S&P 500 companies for EO and LTO and their ESG scores. The final sample consists of a total of 324 firms. The results indicate that EO did not exhibit any statistically significant relationship with ESG scores, while LTO shows a negative statistically significant effect, at a 5% significance level, respectively. Additionally, the interaction term was found to be positively statistically significant at a 5% significance level.

This research aims to contribute to the fields of entrepreneurship and corporate sustainability by exploring the interplay of EO, LTO, and CEP. Theoretically, by uncovering that EO alone does not exhibit any statistically significant effect on CEP, it highlights the importance of considering other factors, such as LTO, to promote sustainable business

practices. This enlarges our understanding of what kinds of entrepreneurship are compatible with sustainability and expands the theoretical framework regarding the relationship between the two concepts. Practically, by recognizing the positive moderating effect of LTO on the EO-CEP relationship, this research implies that firms that possess simultaneously a strong EO and a strong LTO are more likely to achieve better environmental performance. These insights can guide managerial strategic decision-making, encouraging firms to invest in sustainable initiatives and align their practices with the demands of stakeholders. By doing so, firms can enhance their corporate environmental performance, which leads to better financial performance and, subsequently, overall firm success. Ultimately, this paper underscores the importance of sustainability as a strategic imperative for organizations and for a better future.

The remainder of this paper is structured as follows: First, a theoretical background on entrepreneurial orientation, long-term orientation, corporate environmental performance, and stakeholder theory is presented. Then, hypotheses are developed based on previous theory. The empirical analysis' methodology is then discussed, followed by a section on results and interpretations. Finally, the paper's discussion and conclusion sections consist of the implications of our findings, limitations, and future research.

Theoretical Background

Entrepreneurial Orientation

Entrepreneurial orientation (EO) has been a widely studied concept for over three decades. It emerged as an answer to what it means for an organization to be entrepreneurial (Covin & Miller, 2014). It is a renowned concept among scholars to measure the level of entrepreneurship inside an organization. The foundation of EO can be traced back to the work of Mintzberg, who described it as an "active search for new opportunities" with a proactive character under high uncertainty" (1973, p. 45). Afterwards, the concept of EO has been defined by focusing on three sub-dimensions: innovativeness, proactiveness, and risk-taking (Covin & Slevin, 1989; Miller, 1983). They both supported the idea that for the concept to exist, all three dimensions should positively covary. Around a decade later, Lumpkin & Dess (1996), expanded the dimensions to five, including competitive aggressiveness and autonomy. They counterargued the previous perspective and backed the idea that the concept can be claimed even if the dimensions do not positively covary. According to Miller, "an entrepreneurial firm is one that engages in product-market innovation, undertakes somewhat risky ventures, and is first to come up with 'proactive' innovations, beating competitors to the punch (1983, p. 771)."

Consistent with Lumpkin & Dess innovativeness reflects "a firm's tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes", risk-taking is the "degree to which managers are willing to make large and risky resource commitment", proactiveness refers in "acting in anticipation of future problems, needs or changes", autonomy refers to the "independent action of an individual or a team in bringing forth an idea or a vision and carrying it through to completion" and competitive aggressiveness refers to a "firm's propensity to directly and intensely challenge its competitors to achieve entry or improve position, that is, to

outperform industry rivals in the marketplace" (1996, pp. 140, 142, 144, 146, 148). In other words, innovativeness, risk-taking, and proactiveness represent a firm's ability to introduce new products, services, and processes, identify opportunities, and take calculated risks, whereas competitive aggressiveness and autonomy refer to the intensity and independence of strategic moves and decisions conducted by the firm.

In line with Covin and Wales's (2012) perspective, who claims that researchers should choose whichever approach suits their purposes, this study will adopt a multidimensional approach to measure EO, recognizing it as a complex construct with multiple dimensions. However, EO will be treated as a composite index since we do not aim to investigate how the specific dimensions interact with corporate environmental performance but rather how the overall concept of EO relates to it.

Long-term Orientation

Venkatraman (1989) stated that future orientation and proactive behavior are essential components of a firm's strategic orientation. These essential components align perfectly with the concept of long-term orientation (LTO). LTO is closely linked to sustainability and future-oriented behaviors, which are crucial for the enduring success of organizations. The concept of sustainability inherently implies a long-term organizational perspective. According to Hofstede, "...long-term orientation stands for the fostering of virtues oriented towards future rewards, in particular, perseverance and thrift" (2001, p. 359). Miller and Breton-Miller (2005) propose that a company can achieve a sustainable competitive advantage only by aligning the interests of stakeholders with the long-term goals of the organization. Similarly, companies that prioritize LTO place a strong emphasis on effectiveness and allocate resources to initiatives that promote long-term competitive advantage (T. Wang & Bansal, 2012). Hofstede and Minkov support that "businesses in long-term oriented cultures are accustomed to working toward building up strong positions in their markets; they do not expect immediate results" (2010, p. 361). Long-term orientation has been defined as "priorities, goals and most of all, concrete investments that come to fruition over an extended time period, typically, 5 years or more, and after some appreciable delay" (Le Breton–Miller & Miller, 2006, p. 732).

With respect to this definition, this study will capture the effects and outcomes of long-term strategic decisions by incorporating a time lag. Acknowledging the fact that the impact of LTO may require a significant period to materialize and become observable.

Corporate Environmental Performance

Corporate Environmental Performance (CEP) has gained attention from academics and practitioners in environmental fields. Bansal and Roth (2000) note that the construct emerged in the literature in the late 1980s with increasing awareness of businesses' environmental impacts. Initially, Ilinitch et al. (1998) made a first attempt to capture CEP using a multidimensional measurement model that examines various dimensions that are measured by environmental ratings. Later, Xie and Hayase (2007) develop a model for evaluating CEP that

includes environmental management performance and environmental operational performance. Trumpp et al. (2015) expand the concept by adding sub-dimensions including environmental policy, resource efficiency, processes, governance, monitoring, environmental results, inputs and outputs, regulatory compliance, and stakeholder engagement. Three years later, Dragomir defines CEP as "a measure of environmental impact, resource consumption, and related financial elements, along with the efforts towards the reduction of such impacts and the implementation of preventive measures" (2018, p. 1151).

The assessment and evaluation of a company's environmental practices, initiatives, and outcomes constitute CEP. The Environmental, Social, and Governance (ESG) rating system is widely acknowledged as the most accurate method for evaluating and measuring environmental performance. ESG scores provide an assessment of an organization's CEP (Papoutsi & Sodhi, 2020; Rajesh & Rajendran, 2020). A number of studies in the literature utilized ESG scores as a proxy to empirically measure CEP (Khaled et al., 2021; Manrique & Martí-Ballester, 2017; Ng & Rezaee, 2015; Tamimi & Sebastianelli, 2017; Xue et al., 2020). ESG scores are currently the most robust evaluation of CEP as they provide a comprehensive overview of an organization's commitment to sustainability, encompassing its environmental impact, social responsibilities, and ethical governance.

Consistent with prior research, this study will utilize ESG scores as an indicator for CEP.

Stakeholder Theory

Stakeholder theory has been widely recognized as an important theoretical framework in various research fields, including social, environmental, and business sustainability management (Frynas & Yamahaki, 2016; Montiel & Delgado-Ceballos, 2014). The theory promotes value creation in business environments while addressing ethical concerns, taking into account the importance of stakeholders (Freeman et al., 2010). Stakeholder theory emphasizes the significance of managing conflicting relationships and addressing the interests of multiple stakeholders in decision-making processes and operations. Freeman notes that "managers need to take into account all of those groups and individuals that can affect, or are affected by, the accomplishment of the business enterprise" (2010, p. 25). Consequently, it is a social responsibility of organizations to consider the interests of stakeholders, including customers, employees, suppliers, governments, communities, regulatory authorities, and more, not just shareholders. Ultimately, the theory highlights the interdependence between stakeholders and companies, emphasizing the need for stakeholder management through policies and strategies (Freeman, 2010).

Sustainability and stakeholder theory share common characteristics that highlight the purpose of business extending beyond short-term shareholder value, the integration of ethical and business concerns, and the importance of long-term perspectives (Hörisch et al., 2014). Stakeholder theory is essential in analyzing how companies respond to sustainability since it incorporates diverse stakeholder perspectives and preferences, acknowledging the complex environmental issues that organizations face. Stakeholder theory proposes that incorporating sustainability practices and achieving strong performance in environmental and social

challenges contribute to enhancing the long-term value of firms (Ng & Rezaee, 2015). Understanding the mechanisms through which stakeholders influence firms, both directly and indirectly, is important to address these challenges (Etzion, 2007). Nonetheless, establishing and strengthening relationships with stakeholders requires a focus on long-term horizons (Flammer & Bansal, 2017).

Multiple studies have demonstrated a positive connection between stakeholder pressure and sustainable business practices, indicating that stakeholders play a crucial role in convincing organizations to become long-term oriented and environmentally aware. Kassinis and Vafeas (2006) suggest a positive connection between stakeholder pressures and pollution outcomes. The same pressure regarding environmental matters leads to increased corporate environmental performance (Baah et al., 2021; Ramanathan et al., 2014). Meixell and Luoma (2015) report that stakeholder pressure is a driver of sustainability awareness and the implementation of sustainable business practices, while Rudyanto et al. (2018) state that companies under these pressures demonstrate a superior level of sustainability reporting. As a result, organizations are adopting proactive environmental management strategies due to government regulations, legal liabilities, customer demands, and growing pressures from stakeholders (Darnall et al., 2010).

By integrating stakeholder theory into sustainability concerns, companies can align their strategies with the interests of stakeholders to promote environmental responsibility and ensure better corporate environmental performance.

Hypotheses Development

Recent studies have shed light on the positive relationship between entrepreneurial orientation and corporate environmental performance (Ahmed et al., 2020; Dickel, 2018; Marshall et al., 2015; Niemann et al., 2020). This positive impact is further enhanced by certain components of EO, such as innovativeness, proactiveness, and risk-taking, which all lead to higher CEP (Silva et al., 2021). Additionally, proactiveness is associated with a firm's commitment to sustainability, while innovativeness has a positive influence on its environmental performance (Abbade et al., 2014; Jansson et al., 2017). Similarly, these two dimensions are positively related to ESG ratings (Kihm, 2019). Also, EO interacts with firm performance to drive investments in sustainability initiatives (Mullens, 2018). Furthermore, EO has been linked to three sustainability decision-making profiles: singular, flexible, and holistic (DiVito & Bohnsack, 2017). Collectively, these results imply that EO is a significant factor in determining sustainability performance.

The positive influence of EO on corporate environmental performance (CEP) can be strengthened by stakeholder theory. The nature of EO, especially proactiveness, enables firms to identify and respond to the needs and expectations of stakeholders, who increasingly value sustainability. Additionally, innovativeness also fosters the development of sustainable initiatives that align with stakeholder demands. Companies with a strong EO are more likely and capable of engaging in proactive environmental management and innovative sustainable practices, as well as investing in environmentally friendly initiatives (Abbade et al., 2014; Jansson et al., 2017; Mullens, 2018). All these are in the best interest of sustainability-conscious stakeholders. The alignment between stakeholder theory and the capabilities of firms with

higher levels of EO is expected to increase CEP, as reflected by ESG scores. That leads to our first hypothesis:

H1: *Entrepreneurial Orientation (EO) positively influences Corporate Environmental performance (CEP), as measured by ESG Scores.*

The role of Long-Term Orientation (LTO) in sustainability practices has been explored in prior literature. LTO serves as a key element in organizational sustainability (Caprar & Neville, 2012). The short-term focus that prevents businesses from investing in environmentally friendly initiatives can be overcome by a LTO (T. Wang, 2017). In addition, LTO is expected to enhance the benefits associated with CRS activities and positively contribute to perceptions among stakeholders (Rehbein et al., 2013). Wang and Bansal (2012) argue that new ventures with a LTO can gain positive economic returns from socially responsible activities, while Maletič et al. (2014) propose LTO as an internal contingency factor influencing the implementation of sustainability practices. Sternad and Kennelly (2017) highlight the significance of LTO in promoting sustainability related actions at various levels of corporate activity. Furthermore, LTO indirectly influences emissions through its impact on green strategy and innovation, which directly contribute to emission reductions (Saether et al., 2021). Lastly, a culture of LTO is linked to environmental management and performance (Durach & Wiengarten, 2017).

This relationship can also be enhanced by stakeholder theory. The theory emphasizes the importance of considering long-term perspectives along with the interests of multiple stakeholders, which include environmental concerns (Freeman et al., 2010). Likewise, there is an interdependence between stakeholders and companies, highlighting the need for stakeholder management and long-term strategies (Freeman, 2010). Furthermore, long-term perspectives imply the ability to invest in sustainable initiatives that can enhance corporate environmental performance. This alignment between stakeholder theory and the significance of long-term perspectives is consistent with the concept of LTO. The increased environmental performance through LTO and the alignment with stakeholder theory leads to our second hypothesis:

H2*: Long-term Orientation (LTO) positively influences Corporate Environmental Performance (CEP), as measured by ESG Scores.*

As we already discussed, EO, especially innovativeness and proactiveness, has been found to have a positive influence on CEP. Firms that have a higher level of EO are more likely to engage in proactive environmental management, innovative sustainable practices, and invest in environmentally friendly initiatives that are in line with the interests of environmentally conscious stakeholders (Abbade et al., 2014; Jansson et al., 2017; Mullens, 2018). In a similar manner, LTO, which focuses on long-term perspectives, enables firms to overcome short-term behaviors and invest in sustainable initiatives that improve corporate environmental performance (Durach & Wiengarten, 2017; Saether et al., 2021; T. Wang, 2017). Additionally, LTO enhances sustainability benefits and positively contributes to stakeholders perceptions

(Rehbein et al., 2013). Finally, stakeholder theory proposes that firms need to align their strategies with the interests of stakeholders to promote environmental responsibility and long-term success (Freeman, 2010).

Stakeholders increasingly value sustainability, and EO facilitates their responsiveness towards their demands. This alignment is crucial to ensuring firm success. Equally, this alignment can be further strengthened by the presence of LTO. Firms with LTO are more likely to identify and take into consideration the long-term benefits and implications of their actions, as well as ensure alignment with the interests of sustainability-focused stakeholders. The integration of stakeholder theory, EO, and LTO promotes sustainable practices while effectively addressing stakeholder concerns, ultimately leading to enhanced corporate environmental performance. Overall, the positive impact of EO on CEP is expected to be strengthened when firms possess an LTO. That leads to our third hypothesis:

H3: *Long-term orientation (LTO) will positively moderate the relationship between entrepreneurial orientation (EO) and Corporate Environmental Performance (CEP).*

Methods

The purpose behind this study is the investigation of the relationship between entrepreneurial orientation (EO), long-term orientation (LTO), and corporate environmental performance (CEP) among S&P 500 firms. The proposed hypothesis is that both EO and LTO will positively influence CEP and that LTO could potentially positively moderate this relationship. To examine this, we will make use of archival data, following a deductive approach, and employ quantitative methods utilizing panel data to validate, refine, or invalidate the existing theory (Nenty, 2009). The empirical analysis will be conducted with an explanatory research design to test the hypotheses and the causal relationships among the variables. The purpose of an explanatory research design is to test the theory with the intention of seeking causal relationships among concepts (O'Gorman & MacIntosh, 2015). To address the research question, a (moderated) multiple regression analysis will be conducted. In the following sections, we describe the empirical setting and sample, data collection, measures, and empirical analysis in more detail.

Empirical Setting and Sample

The research focuses on firms as the population of interest, specifically firms from the Standard & Poor's 500 index. The free-float weighted index is a widely recognized stock market index that measures the performance of the 500 largest, influential, and most prestigious companies in the United States. These companies represent a diverse range of 11 sectors, including communication services, finance, healthcare, and more and are chosen based on their market capitalization, liquidity, and other eligibility criteria (S&P Global, 2023). From a population of 500 firms, 340 were selected randomly to create our sample. The choice of this

sample is appropriate and representative as the level of entrepreneurship and long-term orientation, as well as the ESG scores among these firms are significantly varying while their large market capitalization allows them to make a substantial impact on their corporate environmental performance.

The sample was filtered to include only those companies that had complete data on all the variables of interest. The final number of the sample consisted of 324 firms. Sample data was collected for a 5-year period, from 2016 to 2020, for the variables representing EO and LTO, while data for ESG scores is available from S&P Global for the years 2018 to 2022 only. However, this time frame is particularly suitable for our research, as the definition of LTO suggests that the effects require at least 5 years to manifest given the complexities involved in implementing sustainable practices and the potential time lag for stakeholders to recognize and reward such efforts (Le Breton–Miller & Miller, 2006). Thereby, we can assess the relationship between EO, LTO, and ESG Scores, while accounting for the time required for a firm's strategies to influence its environmental performance.

Data collection

Archival data will be our main source of information for firm-level data. Specifically, letters sent to shareholders for each company in our sample over a period of five years, from 2016 to 2020, were analyzed to derive each term referring to entrepreneurial orientation and long-term orientation. Computer-aided text analysis (CATA) techniques were employed to extract and code the relevant information from the letters. CATA involves the use of specialized software to automatically identify keywords or phrases in text data. The identified keywords are then coded into numerical values for use in the empirical analysis. This approach can save time and increase the accuracy and consistency of the data analysis process (Neuendorf, 2017). Corporate environment performance (CEP) was proxied by ESG scores, which were obtained from the publicly available database of S&P Global (S&P Global, 2023). The scores also span a 5-year period, from 2018 to 2022.

Measures

Entrepreneurial Orientation

Entrepreneurial orientation (EO) was measured according to the instructions provided by Short et al.'s (2010) dictionary. Specifically, the authors identified a total of 244 words that represent EO, with autonomy having 36 words, innovativeness having 86, proactiveness having 27, competitive aggressiveness having 58, and risk taking having 37 (Short et al., 2010). The word list can be found in Short et al.'s (2010) paper, Table 3, p. 333. According to Short et al. (2010), content analysis of shareholder letters is a better alternative than surveying to measure EO as it offers a deeper understanding of a firm's behavior. Shareholder letters offer insights into managerial beliefs and values, are widely read, and are usually written by the CEO, who can provide a better unbiased understanding of the level of entrepreneurship inside an organization. The average scores for EO were used in the analysis to provide more robust

results. The average score was calculated from the total number of words referring to EO over the total word count derived from the letters to shareholders. The scores ranged from 0.00 to 1.

Long-term Orientation

Long-term orientation (LTO) was measured according to the definitions provided by Slawinski and Bansal (2012). In their study, two types of companies were identified based on their perception of time: the "focused" and the "integrated". The former focused on internal operations and immediate solutions, while the latter invested in collaborations and long-term responses. Basically, the distinction lies between companies that prioritize short- and long-term outcomes. A better understanding of the time perspectives is provided in Slawinski & Bansal's (2012) paper, Table 5, page 1555. In other words, the term "short" refers to a period that spans five years or less, while "long" pertains to a time frame that extends for twenty years or more. The same content analysis suggested by Short et al. (2010) to measure EO was conducted in the context of LTO from letters to shareholders to capture the level of long-term orientation in the companies. As in the case of EO, average scores were used for LTO to provide more robust results. The average score was calculated from the total number of words referring to LTO over the total word count derived from the letters to shareholders. The scores ranged from 0.00 to 1.

Corporate Environmental Performance and ESG Scores

Corporate environmental performance (CEP) was measured and proxied by Environmental, Social, and Governance (ESG) scores representing each company in the dataset. According to the S&P Global website, the scores are derived from "a combination of verified company disclosures, media and stakeholders' analysis, and in-depth company engagement via the S&P Global Corporate Sustainability Assessment" (S&P Global, 2023). The scores offer transparency into specific environmental, social, and governance factors for up to 30 key areas within 61 different sub-industries, encompassing 130 sustainability topics with over 1,000 data points per company (S&P Global, 2023). More information regarding the methodology can be found in Appendix 1. Each of the three ESG dimensions has different weights accounting for each company's specific industry and is evaluated based on explicit criteria. The environmental dimension includes criteria like emissions, climate strategy, and decarbonization. Additionally, the social dimension consists of criteria like human rights, labor practices, and customer relationship management. Lastly, the governance dimension considers business ethics, supply chain management, and corporate governance. The S&P Global ESG Scores are calculated as the "sum of the weighted dimensions scores" and range from 0 to 100 (S&P Global, 2023). However, in the analysis, the scores were transformed into percentages and ranged from 0.00 to 1.

Control variables

The total number of control variables is five and includes (eleven) sectors, the debt-to-equity ratio, return on assets, total long-term assets, and revenue. Previous research has confirmed the influence of these variables on ESG scores (Buallay, 2018; Dienes et al., 2016; Drempetic et al., 2020; Landi & Sciarelli, 2018; Lu & Wang, 2021; Tamimi & Sebastianelli, 2017).

Sectors will be controlled because different sectors may have varying levels of environmental performance and sustainable practices. Debt-to-equity ratio, return on assets, total long-term assets, and revenue are all financial-related variables that could provide insights into a company's financial position, its profitability, as well as its capacity to invest in environmentally friendly initiatives. Controlling the debt-to-equity ratio helps mitigate the potential influence of financial leverage on environmental performance. Considering return on assets ensures that the effects on environmental performance are not solely driven by financial performance. A company's commitment to long-term planning and investments can be captured through its total long-term assets and must be considered. Lastly, controlling revenue addresses differences in company size and market position, making sure that any effects on environmental performance are not driven by these factors. These variables are important to consider in the analysis to isolate any observed effects of EO and LTO on CEP.

A more comprehensive overview of the operationalization of variables is presented in Appendix 2.

Empirical Analysis

All statistical analysis was done in STATA (16.1) software, utilizing panel data. Panel or longitudinal data have "observations on the same units in several different time periods" (Kennedy, 2008, p. 281). Panel data provides a number of advantages, such as richer and more informative data, greater variability, reduced collinearity among variables, increased degrees of freedom, and improved efficiency (Baltagi, 2008). In this study, we made use of a (strongly) balanced panel dataset in which every entity (company) has data for all time periods (years).

The statistical analysis involves the examination of the presence of group-specific (individual) effects or time effects to account for potential heterogeneity or unobserved individual effects. Individual effects can be analyzed using fixed effects (FE), which investigate variations in intercepts across groups or time periods. Time effects can be analyzed with random effects (RE), which explore differences in error variance components across individuals or time periods. In a fixed effect model, it is considered that the correlation between individual effects and regressors exists, thus estimating separate intercepts for each group or time to capture individual-specific effects and within-group or time variations. In a random effect model, it is assumed that no correlation exists between individual effects and regressors, thus estimating group or time-specific error variances. A fixed effects model can be estimated with a least squares dummy variable (LSDV) estimator and a random effects model with (feasible) generalized least squares (F-GLS).

To determine the presence and significance of fixed and random effects, various tests can be conducted. The F-test is used to examine the presence of fixed effects, while the Breusch-Pagan Lagrange Multiplier (LM) test checks for the presence of random effects (Breusch & Pagan, 1980). If both null hypotheses are not rejected, then pooled OLS is preferred. If both tests reject their null hypotheses, indicating the presence of group or time effects, the Hausman test is conducted. The Hausman test compares the two models (FE vs. RE), assessing if a correlation exists between individual effects and other regressors (Hausman, 1978). If the null hypothesis, which proposes an uncorrelation between individual effects and regressors, is rejected, Hausman suggests that a fixed effect model is preferred; otherwise, a random effect model is chosen.

To test the proposed hypotheses, we had to make use of three different models. The first model includes the dependent variable (ESG Scores) and only the control variables as independent variables (Debt-to-Equity Ratio, Return on Assets, Total Long-Term Assets, Revenue, and 11 dummy variables for Sectors). The second model consists of the dependent variable and the direct effects of EO and LTO, plus the control variables. The third and last model includes the dependent variable and the interaction term of EO and LTO, the direct effects, plus the control variables. The first model was used to check for the significance of the control variables on ESG Scores. The second model focused on the significance of the direct effects, and the third model specifically examined the significance of the interaction term on ESG Scores.

The first two hypotheses (H1, H2) were tested with multiple regression analysis, while the final hypothesis (H3) was tested by a moderated multiple regression analysis (MMR). Interaction or moderating effects explore if a third variable affects the relationship between two variables (Hayes, 2017). MMR is one of the most commonly used techniques for testing hypotheses regarding interaction effects (Aguinis & Gottfredson, 2010). In our case, it is an appropriate approach that allowed us to test the possible moderating effect of long-term orientation on the entrepreneurial orientation corporate environmental performance relationship.

Estimation models

Model 1:

$$\begin{aligned}\mathrm{ESGScores}(it) &= a + \beta_0 + \beta_1 \mathrm{D/E}it + \beta_2 \mathrm{TLA}it + \beta_3 \mathrm{ROA}it + \beta_4 \mathrm{Rev}it \\ &+ \beta_5 \mathrm{SectorDum}(1-11)it + \varepsilon_{it}\end{aligned}$$

Model 2:

$$\begin{aligned}\mathrm{ESGScores}(it) &= a + \beta_0 + \beta_1 \mathrm{EO}it + \beta_2 \mathrm{LTO}it + \beta_3 \mathrm{D/E}it + \beta_4 \mathrm{TLA}it + \beta_5 \mathrm{ROA}it + \beta_6 \mathrm{Rev}it \\ &+ \beta_7 \mathrm{SectorDum}(1-11)it + \varepsilon_{it}\end{aligned}$$

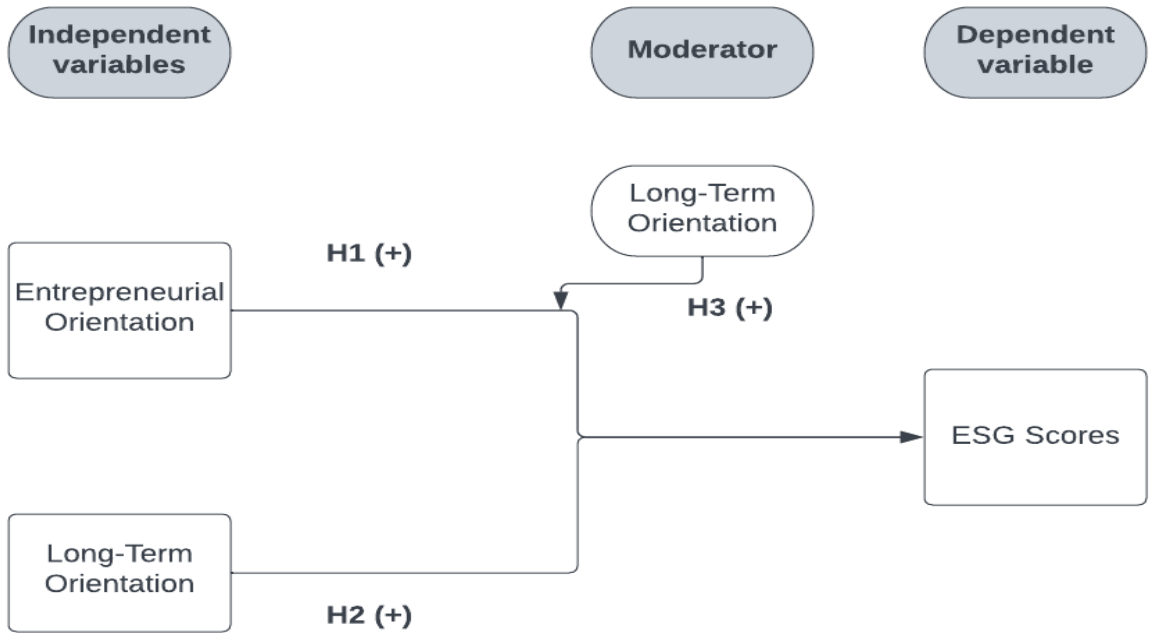
Model 3:

$$\text{ESGScores}(it) = a + \beta_0 + \beta_1 \text{EO}it + \beta_2 \text{LTO}it + \beta_3 \text{EOxLTO}it + \beta_4 \text{D/E}it + \beta_5 \text{TLA}it + \beta_6 \text{ROA}it + \beta_7 \text{Rev}it + \beta_8 \text{SectorDum}(1-11)it + \varepsilon_{it}$$

where,

EO: Entrepreneurial Orientation
LTO: Long-Term Orientation
EOxLTO: Interaction term of EO and LTO
D/E: Debt to Equity ratio
TLA: Total Long-term Assets
ROA: Return on Assets
Rev: Revenue
SectorDum(1-11): Dummy variables for 11 sectors
α: individual-specific effect
i: companies = 1-324
t: years = 1-5
β_0: intercept
β_{1-8}: coefficient estimates
ε: estimated residual, in case of FE α = α + u_i and ε = v_{it}, in case of RE ε = ($u_i + v_{it}$), where *ui* ~ *IID*(0, σ*u*2) , and *vit* ~ *IID*(0, σ*v*2) .
* the natural logarithm (ln) was used in all control variables

Figure 1: Conceptual model



Results and Interpretation

Prior to conducting the data analysis, the necessary data transformations were performed. The dataset was processed, and after careful examination, "cleaned" in Microsoft Excel before being imported into Stata for statistical analysis. A crucial aspect involved the identification of missing values within the variables, ensuring that all variables of interest had the same number of observations. After that, the dataset was imported into Stata for further analysis. The initial procedure involved generating dummy variables for each of the 11 sectors, representing the 324 companies included in the dataset. More about the distribution of the sectors in the dataset can be found in Appendix 3. In addition, the variables in the dataset contained outliers, which could potentially impact the results. However, outliers represent real-life observations, and we decided to retain them. Subsequently, the natural logarithm transformation was applied to all control variables. This transformation aimed to address issues related to distributional properties and to facilitate the interpretation of the coefficients since now they indicate the percentage change in the dependent variable (ESG Scores).

A descriptive statistics table (Table 1) was created to provide a more comprehensive overview of the variables.

Table 1: Descriptive statistics

	ESG* **	**EO** **	**LTO** **	**D/E***	**TLA***	**ROA***	**REV***
Mean	0.381	0.031	0.001	-0.121	9.566	1.525	9.261
Median	0.340	0.031	0.0008	-0.131	9.570	1.70	9.180
Maximum	0.91	0.076	0.008	5.951	13.798	3.724	12.863
Minimum	0.05	0	0	-8.517	3.655	-3.868	5.656
Std. Dev.	0.205	0.009	0.001	1.237	1.503	1.071	1.243
Variance	0.042	0.00009	1.54e-06	1.532	2.259	1.147	1.546
Skewness	0.531	0.042	1.681	-0.811	0.044	-0.887	0.240
Kurtosis	2.224	3.945	6.982	9.638	3.580	4.156	2.912
Jarque-Bera	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	1,620	1,620	1,620	1,620	1,620	1,620	1,620

*All control variables are set on their logarithmic values
**EO and LTO are set on their average values
***ESG scores are set on percentage values

The sample consists of 1,620 observations from a total of 324 S&P 500 firms for the years from 2016 to 2020, except for ESG Scores that range from 2018 to 2022. As mentioned before, this is because S&P Global provides ESG data only from 2018. Nevertheless, this is favorable since theoretically, the effects of LTO require at least 5 years to show up on ESG scores. The current format of the dataset includes a natural lag of 2 years. The summary statistics reveal interesting insights into the variables of interest, namely ESG Scores (the dependent variable) and EO and LTO (independent variables). To begin with, all three variables have positive skewness, indicating a long right tail in their distributions. Additionally, these variables demonstrate positive kurtosis, suggesting leptokurtic distributions. The low p-values

obtained from the Jarque-Bera test demonstrate strong evidence against the normality assumption of the data.

The ESG Scores display a wide range with a minimum value of 0.05 and a maximum value of 0.91, indicating substantial variation in sustainability ratings among the companies. The mean value of ESG Scores is 0.38 with a standard deviation of 0.20, suggesting a considerable range of values. This was anticipated since sustainability efforts can vary significantly among different firms in different sectors.

Similar patterns can be observed for EO, where the minimum average value is 0 and the maximum is 0.07, meaning that there are significant differences in entrepreneurial levels between the companies. The mean value for EO is 0.03 and the standard deviation is 0.009, reflecting quite a variety in the range of values. Again, these findings align with expectations since EO is a concept encompassing five different dimensions that can easily vary significantly among different firms. As a result, different firms exhibit different emphasis and implementation on each of these dimensions, leading to differences in their entrepreneurial levels.

Regarding LTO, the minimum average value is 0 and the maximum value is 0.008, implying different priorities among the companies. The mean value of LTO is 0.001 with a standard deviation of 0.001, indicating smaller variations among the values. However, it is important to note that because of the way LTO is measured even the slightest differences can have an impact on a company's long-term focus. Consequently, these variations can explain distinctions among strategic orientations and approaches to long-term planning.

The correlation table (Table 2) was calculated to examine the relationship between the variables as well as to detect the potential presence of multicollinearity.

Table 2: Correlation matrix

	ESG	**EO**	**LTO**	**D/E**	**TLA**	**ROA**	**REV**
ESG	1.0000						
EO	0.1189*	1.0000					
LTO	-0.0321	0.0474**	1.0000				
D/E	0.0810*	0.0408	0.0344	1.0000			
TLA	0.3247*	-0.0698*	-0.0416**	0.1303*	1.0000		
ROA	-0.1040*	0.0758*	-0.0443**	-0.0669*	-0.5069*	1.0000	
REV	0.2862*	-0.0212	-0.0827*	0.1222*	0.6779*	-0.1162*	1.0000

*,** means significant at the 0.05 and 0.1 level respectively

Table 2 indicates significant correlations between most of the variables primarily at the 5% significance level. However, correlation does not imply causation. The correlation values are not high enough to exclude them from the dataset except from the correlation between Revenue and Total Long-Term Assets, which is 0.68. This suggests that companies with higher revenues tend to possess more total long-term assets, which is logical. However, 0.68 is considered acceptable and does not exceed the problematic threshold of 70%.

For the variables of interest, namely ESG Scores, EO, and LTO, we can see from Table 2 that there is a weak but statistically significant positive correlation for EO and ESG Scores at a 5% significance level. This implies that companies with higher levels of entrepreneurship tend to perform better on their ESG Scores compared to their counterparts. As for the relationship between LTO and ESG Scores, no significant effects are observed from the correlation table. However, this is anticipated since the effects of LTO require some time to present at ESG Scores. Furthermore, there are significant correlations among ESG Scores and all the control variables, at a 0.05 significance level. This means that these variables should be included in the regression models to acquire more reliable effects from EO and LTO on ESG Scores.

To assess the presence of multicollinearity among the independent variables, the correlation matrix is not enough, so Variance Inflation Factors (VIFs) were computed in Appendix 4. VIF is the most popular multicollinearity diagnostic test and measures the extent to which an independent variable can be explained by all the other independent variables in a regression model (Alin, 2010). The independent variables were regressed against another independent variable, specifically against EO, and their VIFs were computed. As evidenced from Appendix 4, all the VIF values are low, with a mean of 1.71. Even for variables such as Total Long-term Assets that had a relatively high correlation with Revenues. None of the variables exceeds the threshold value of 10 to be excluded from the regression models (Alin, 2010).

In the following table (Table 3), the regression results along with goodness-of-fit measures are presented for all three models. The reported goodness-of-fit measures are the F-test, degrees of freedom, variance components, and theta (θ). The F-test is used to assess the overall significance of the regression model. A p-value of an F-test greater than the critical value is required to confirm the significance of the model. The degrees of freedom are used to check the variability of the statistical estimates, with higher degrees of freedom meaning more reliable estimates. The variance components explain the proportion of total variability in the dependent variable that is due to random effects, or the error term. Finally, theta (θ) represents the estimated variance ratio between individual-specific effects and group-level effects, ranging from 0 to 1. Theta values closer to 0 suggests stronger individual-level effects (fixed effects) and values closer to 1 indicate stronger group-level effects (random effects).

Robust standard errors were used in all three models to account for the presence of autocorrelation and heteroskedasticity (Hoechle, 2007). As proposed in the methodology section, a series of tests were conducted to determine the presence of fixed and random effects as well as to select between these two. First, a fixed effects regression model was calculated, followed by an F-test to examine the presence of fixed effects. Subsequently, a random effects regression model was estimated along with a Breusch-Pagan Lagrange multiplier (LM test) to assess the presence of random effects. Finally, a Hausman test was performed to determine any differences between the fixed and random effects models. The purpose of these tests was to ensure suitable modeling approaches best accounted for the underlying nature and variability of the data. Specific details regarding the outcomes of these tests can be found in the Supplementary Material.

Next, we discuss each of the three models separately along with the estimated results and goodness-of-fit measures.

Table 3: Random Effects (RE) regression results

	Model 1	**Model 2**	**Model 3**
EO		-.0284 (.3351)	.01915 (.3058)
LTO (Lagged)		**-4.5450 *[1]** **(2.3188)**	-.0171 *[2] (.0075)
EOxLTO			**.4457 *** **(.2289)**
D/E[3]	-.0061 (.0051)	-.0047 (.0048)	-.0066 (.0052)
TLA[3]	**.0502 *** **(.0109)**	.0324 * (.0097)	.0584 * (.0097)
ROA[3]	.0028 (.0037)	.0013 (.0033)	.0037 (.0037)
REV[3]	**.0380 *** **(.0134)**	.0078 (.0114)	-.0007 (.0118)
Communication Services	**-.1803 *** **(.0648)**	-.1402 * (.0695)	-.1511 * (.0682)
Consumer Discretionary	-.0480 (.0549)	-.0608 (.0562)	-0.252 (.0548)
Consumer Staples	.0302 (.0620)	.0178 (.0619)	.0421 (.0621)
Energy	-.0008 (.0566)	.0586 (.0580)	.0461 (.0586)
Financials	**-.0884 *** **(.0454)**	-.0596 (.0461)	-.0792 ** (.0460)
Health Care	.0337 (.0517)	.0468 (.0518)	.0599 (.0523)
Industrials	-.0212 (.0503)	-.0171 (.0519)	.0007 (.0514)
Information Technology	.0305 (.0484)	.0313 (.0495)	.0503 (.0489)
Materials	.0597 (.0635)	.0669 (.0630)	.0783 (.0626)
Real Estate	.0911 (.0559)	.0971 ** (.0532)	.0742 (.0506)
Utilities	0 (omitted)	0 (omitted)	0 (omitted)
Intercept (constant)	-.4483 * (.0899)	.0338 (.0862)	-.1722 * (.0884)
F-test (model)	148.59 * (.000)	67.45 * (.000)	107.86 * (0.00)
Df	1,605	631	954
$\sigma\hat{}v$	.0760	.0420	.0564
$\sigma\hat{}u$	.1740	.1761	.1773
rho	.8396	.9461	.9080
θ (theta)	.8081	.8336	.8192
N	1,620	648	972

[1] 3rd lag
[2] 2nd lag
[3] Natural logarithm transformation
*p-value < 0.05, **p-value < 0.10

Model 1: Control variables

The first model encompassed the control variables, including the Debt-to-Equity ratio, Total Long-term Assets, Return on Assets, Revenue, and Sectors. All control variables were transformed into their logarithmic forms, indicating the percentage change in ESG scores.

Firstly, the F-test confirmed the presence of fixed effects with a value of 15.00 and a p-value of 0.00. Secondly, the Breusch-Pagan Lagrange multiplier provided evidence for the presence of random effects with a test statistic (t-test) of 2219.42 (chi2) and a p-value of 0.00. Finally, the Hausman test indicated the preference for the random effects model with a t-test of 7.74 (chi2) and a p-value of 0.10. More information regarding the results of the tests can be found in the Supplementary Material.

As for goodness-of-fit measures we can observe from Table 3 that the model was significant at the 5% significance level with an F-test of 148.59 (p-value=0.00). From the parameter "rho", we can see that the individual specific error explained 84% of the entire composite error variance. In other words, there are substantial differences between the companies that play a significant role in explaining the variability in ESG Scores. Additionally, the high value of theta (θ), around 81%, indicates the importance of considering random effects.

Total long-term assets (TLA) were found statistically significant at a 5% significance level with a coefficient estimate of 0.05 and a standard error of 0.01. Meaning that as the TLAs of a company increase by one unit, the ESG scores are expected to increase by 5%. The positive relationship between TLA and ESG scores can be attributed to the fact that companies with a larger TLA often have greater financial resources and capabilities, which may be invested in sustainable practices that enhance their ESG scores. Additionally, TLA can be an indicator of a company's long-term planning, stability, and resilience, which can incline them to consider environmental factors in their business strategies, which can positively influence their ESG scores. Finally, can TLA generally enable companies to implement sustainable practices that enhance their ESG performance.

Revenue was the second statistically significant control variable at the 5% significance level. The coefficient estimate was 0.03 with a standard error of 0.01, meaning that as the revenues of a company increase by one unit, the ESG scores are expected to increase by 3%. This positive relationship can be theoretically explained by the fact that as a company experiences growth in its revenues, including expansions in business operations, market and company size, and customer base, it has additional financial resources that can be allocated towards sustainable initiatives that can increase ESG performance. Furthermore, as revenues increase, stakeholders' pressure towards companies also increases, incentivizing companies to prioritize sustainable and social concerns to maintain a positive image towards their stakeholders to acquire a positive reputation, attract investments, and retain customers.

The Communication Services sector (Sector 1) and the Financials sector (Sector 5) were found to be statistically significant at a 5% significance level. Both sectors indicated a negative relationship with ESG scores. Sector 1 had a coefficient estimate of -0.05 with a standard error of 0.05, while Sector 5 had a coefficient estimate of -0.09 with a standard error of 0.04. In simpler terms, companies included in the Communication Services and Financial sectors face

a -0.05 and -0.09 minor reduction in their ESG scores, respectively. The negative relationship observed between the Communication Services and Financials sectors with ESG scores could be explained by the nature of these industries. In the Communication Services, industries such as telecommunication and media often operate under high regulation. There may be environmental and social concerns related to resource consumption, privacy issues, or content moderation, all of which are factors that contribute against ESG scores. Similarly, in the Financial sector, which includes industries like banks and insurance companies, may face ESG challenges associated with their investment practices, risk management, and corporate governance.

Model 2: Direct effects

The second model included the direct effects of entrepreneurial orientation (EO) and long-term orientation (LTO) and their impact on ESG Scores.

By the F-test of 2.31 with a p-value of 0.03 the presence of fixed effects was confirmed. The LM test with a t-test of 281.27 (chi2) and a p-value of 0.03 also confirmed the presence of random effects. Once again the Hausman test indicated a preference for the random effects model with a t-test of 6.81 (chi2) and a p-value of 0.23. More information regarding the tests can be found in the Supplementary Material.

Table 3 presents goodness-of-fit measures with an F-test for the model of 67.45 (p-value=0.00) providing evidence for the significance of the model at the 5% significance level. The "rho" indicates that there are significant differences between the companies that can explain the variability in ESG Scores, with a value of 95%. Moreover, the high theta (θ) of 83% further confirmed the preference for the random effects model.

Entrepreneurial Orientation (EO) did not exhibit any statistically significant relationship with ESG Scores. This finding is contradictory with our first hypothesis (H1), which assumed a positive influence of EO on Corporate Environmental Performance (as measured by ESG Scores).

Long-Term Orientation (LTO) was found statistically significant after 3 lags at 5% significance level. The coefficient estimate was -4.5 with a standard error of 2.3. Alternatively, when there is a lag of three years, a one unit increase in a company's (average) LTO is associated with -4.5 reduction in ESG Scores. Once again, this is in contrast with our second hypothesis (H2), which anticipated a positive relationship between LTO and CEP (as measured by ESG Scores).

Model 3: Interaction term

The third and final model in the analysis included the interaction term of EO and LTO and its potential effect on EGS Scores. To create the interaction term, the variable acting as a moderator, in this case LTO, was first standardized to provide easier interpretation.

At first, the F-test proved the presence of fixed effects with a value of 5.36 and a p-value of 0.00. In addition, the LM test showed the presence of random effects with a t-test of 774.13 (chi2) and a p-value of 0.00. The preference for the random effects model was

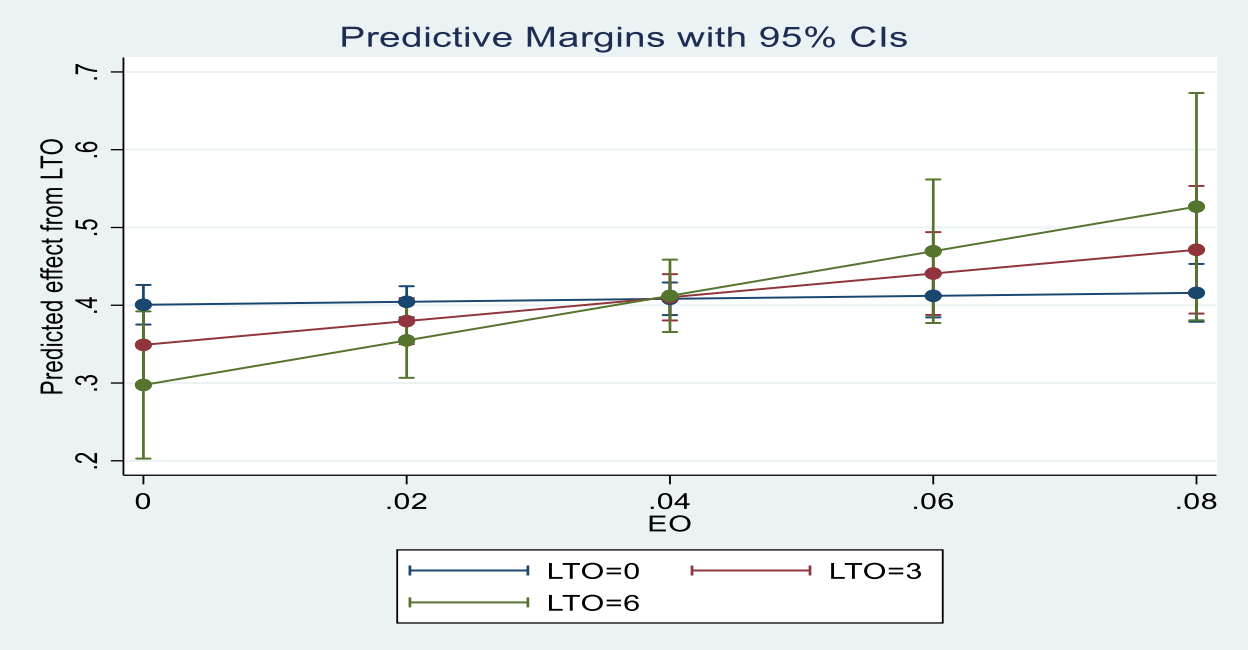
confirmed by the Hausman test with a t-test of 11.28 (chi2) and a p-value of 0.12. Test reports can be found in the Supplementary Material.

Goodness-of-fit measures are presented in Table 3. The F-test of 107.68 (p-value=0.00), indicated the statistical significance of the model at the 5% significance level. Significant differences between the companies explain the variability in ESG Scores, as observed from "rho", with a value of 91%. Furthermore, the preference for the random effects model was further supported by the high theta (θ) value of 82%.

Table 3 indicates that the interaction term of EO and the second lag of LTO was found statistically significant at a 5% significance level. This finding is in accordance with our third hypothesis (H3), which assumed that LTO would positively moderate the relationship between EO and CEP (ESG Scores). Specifically, the coefficient estimate was 0.45, with a standard error of 0.23. In other words, one standard deviation increase in LTO is associated with 0.45 points increase in ESG Scores from EO. Meaning that the combined influence of EO and LTO on ESG Scores is greater than the sum of their individual effects. This translates that when both EO and LTO are high (above their average levels), there is a synergistic effect on improving ESG Scores, considering the other variables included in the regression analysis. Ultimately, a simultaneous presence of a strong EO and of a strong LTO can lead companies to higher ESG Scores.

Figure 2, provides a visualization of the interaction between LTO and EO. The figure shows the predicted effect of LTO as it interacts with EO across different values. We can observe that for lower values of LTO, such as 0, the effect on EO is small and slightly positive. As LTO increases to average values, like 3, the effect becomes moderate and positive. Furthermore, for higher values of LTO, such as 6, the effect becomes increasingly stronger and positive. In summary, the figure suggests that the interactive effect of LTO on EO varies based on the level of LTO. Consequently, as LTO increases, its effect on EO will become positively stronger. More information regarding the interaction term can be found in the Supplementary Material.

Figure 2: Visualization of the interaction term



Discussion

In the analysis of the relationship between entrepreneurial orientation (EO), long-term orientation (LTO), and corporate environmental performance (CEP), the findings revealed insightful outcomes.

Entrepreneurial orientation did not exhibit a statistically significant relationship with ESG scores, contrary to the first hypothesis (H1). This is in line with Chavez et al.'s, (2020) research, which did not find any significant relationship between the direct effects of EO and CEP. Previous research has generally supported a positive relationship; however, it is possible that other factors, such as specific industry characteristics, organizational cultures, or other contextual variables that were not accounted for in this study could further influence this relationship (Dickel, 2018; Jansson et al., 2017; Niemann et al., 2020). Additionally, it is crucial to consider the potential influence of mediating or moderating variables that could further impact this relationship, such as, internal lean practices and a strong environmental mission (Chavez et al., 2020; Dickel, 2018). Overall, the findings suggest that EO alone is not the sole driver of environmental performance. Instead, it should be combined with other concepts, such as LTO, to better understand and enhance corporate environmental performance.

Long-term orientation revealed a negative relationship with ESG scores, contradicting our second hypothesis (H2), which assumed a positive one. It is important to note that the third lag of LTO was found to have a significant impact on ESG scores. As stated in the methodology section, the dataset already includes a two-year lag. Therefore, when considering the third lag of LTO, the cumulative effect on ESG scores becomes evident after a five-year period. This finding aligns with the definition of LTO, which suggests that the effects come into fruition after 5 years (Le Breton–Miller & Miller, 2006). Robustness checks with different time lags can be found in the Supplementary Material.

The existing body of research on the relationship between LTO and CEP is limited. Recent studies also yielded similar results, as they reported no direct relationship between LTO and environmental performance (Graafland & Noorderhaven, 2020; Saether et al., 2021). Likewise, the Graafland and Noorderhaven (2018) study has shown inconsistent findings. In the context of stakeholder theory, the findings could suggest a misalignment between the expectations and priorities of different stakeholders (Eccles et al., 2014; Ingenbleek & Immink, 2010). While long-term oriented stakeholders, such as sustainability-conscious ones, may value environmental performance, short-term oriented stakeholders might exercise different pressures on a company. It is also possible that a high focus on LTO may lead to a trade-off between immediate environmental performance and long-term sustainability goals. Long-term oriented companies may have other strategic objectives as a priority or even face challenges in translating their long-term perspective into immediate actions that directly impact their ESG scores. Additionally, external cultural and institutional factors, environmental uncertainty, market conditions, and regulatory constraints that were not accounted for in the regression analysis may further affect the ability of these firms to effectively implement sustainable practices to achieve better ESG performance (Sternad & Kennelly, 2017) Moreover, it is possible that a LTO may not communicate as a driver of sustainable performance. For example, companies may prioritize investments and decisions that yield long-term financial returns, such as investing heavily in research and development, capital expenditures, or expansion projects

which can be attributed to a long-term perspective but do not directly contribute to better ESG performance.

The interaction between entrepreneurial orientation and long-term orientation was found to be statistically significant, with a positive effect on ESG scores. This is consistent with our third hypothesis (H3).

It is important to note here, that the second lag of LTO was found to positively interact with EO to improve ESG performance. Contrary to the direct impact of LTO, which manifested after the third lag, this finding suggests that when LTO is combined with EO, its effect becomes evident within a shorter timeframe. Specifically, considering the existing two-year lag in the dataset, the interaction of LTO with EO contributes to ESG performance after a total of four years. Consequently, this result indicates that the combined influence of the two concepts has a more immediate impact compared to its direct effects. Additional robustness checks with different time lags can be found in the Supplementary Material.

Currently, there is a lack of research examining the interplay of EO and LTO on CEP. Although, our findings align with a similar study by Graafland and Noorderhaven (2020), which reported that economic freedom and long-term orientation interact synergistically to increase corporate social responsibility performance.

The positive relationship between the interaction of EO and LTO on ESG Scores can be attributed to several factors. First and most importantly, in the complementary nature of EO and LTO. EO emphasizes innovation, risk-taking, proactiveness, autonomy, and competitive aggressiveness, while LTO focuses on strategic planning, persistence, and future-oriented decision-making. Both orientations have distinct but complementary characteristics that can enhance a firm's environmental performance. EO provides firms with the agility and adaptability to identify and pursue sustainable initiatives, while LTO ensures that these initiatives are aligned with the firm's broader long-term goals and stakeholder demands. Furthermore, EO encourages firms to seek opportunities, experiment with new ideas, and adapt to changing market conditions. On the other hand, LTO provides stability and strategic environmental focus (Mullens, 2018; T. Wang & Bansal, 2012). The combination of EO and LTO can lead to various synergies, addressing different aspects inside an organization that can contribute to business performance and ultimately to greater sustainable performance.

Secondly, alignment with stakeholder demands can act as a driver behind this relationship. The concept of long-term orientation is future-oriented, which makes it a suitable match with sustainability. Long-term oriented firms are more likely to prioritize the demands of sustainability-focused stakeholders, such as investors concerned with environmental, social, and governance issues, which are also consistent with the sustainable practices and goals of these firms (Flammer & Bansal, 2017). Additionally, the nature of EO, especially proactiveness and innovativeness, is also aligned with sustainability. Proactiveness, which promotes responsiveness, can enable firms to effectively address stakeholder demands regarding environmental needs and opportunities (Giraud Voss et al., 2005). Similarly, innovativeness can foster the development of sustainable initiatives that are also in line with stakeholder demands (Abbade et al., 2014). Consequently, it is this combination of EO and LTO that facilitates firms' ability to balance short-term market goals with long-term sustainability objectives to effectively respond to the demands of ESG-conscious stakeholders.

Lastly, EO and LTO can have a multi-dimensional impact on ESG Scores. As stated in the methodology, ESG scores capture various aspects of environmental, social, and governance performance. For example, EO can positively contribute to the environmental dimension by its innovative nature, while LTO can positively contribute to the social dimensions by responding to stakeholder demands. The interaction effect of EO and LTO suggests that the joint presence of these orientations can have a positive influence on ESG scores.

Theoretical Implications

Overall, the insignificant relationship between EO and ESG Scores, as well as the negative relationship among LTO and ESG Scores, suggests that the dynamics behind these variables and CEP are more complex and multifaceted. This study provides theoretical implications by expanding our understanding of the dynamics behind the relationships between EO, LTO, and CEP. Previous research has predominantly examined the impact of EO and LTO on CEP in isolation from each other. Regarding EO, the findings indicate that EO alone is not a sole driver of environmental performance, at least in the context of high performing companies, such as S&P 500 firms. By uncovering the insignificant effect of EO on ESG Scores, our findings highlight the importance of considering other factors, including LTO, to promote corporate environmental performance. The findings underscore the significance of a holistic approach that considers multiple dimensions. They also highlight the need to move beyond isolated effects and emphasize the value of considering combined influences. This enhances our comprehension of the types of entrepreneurship that are compatible with sustainability and broadens our theoretical perspective regarding the relationship between these two concepts. The study contributes to the literature on entrepreneurship and corporate sustainability by shedding light on the mechanisms and dynamics behind these fields.

Practical Implications

The practical implications of this study can have significant relevance for managers, policymakers, and decision makers from a real-world perspective. As proof from our study, the positive moderating effect of LTO on the EO-CEP relationship suggests that firms that possess both EO and LTO are more likely to achieve better corporate environmental performance. In other words, the integration of EO and LTO can have a profound impact on a company's ESG scores. Managers should consider their combined influence when implementing sustainable initiatives. Policymakers can also benefit from our findings by recognizing the importance of contemplating both concepts when designing sustainable policies and frameworks. Furthermore, decision-makers need to consider stakeholder demands when addressing sustainability challenges. By doing so, organizations can increase their corporate environmental performance, which translates to higher ESG ratings. Consequently, higher ESG ratings lead to investor attractiveness (H.-Y. Chen & Yang, 2020; Kachalov & Finogenova, 2023; Leite & Uysal, 2023). Increased investor interest can lead a firm to have more access to capital, new partnerships, and an enhanced reputation. Additionally, higher ESG ratings are associated with higher stock returns (Glück et al., 2021; Serafeim & Yoon, 2022; Shanaev &

Ghimire, 2022). Higher stock returns mean that firms can generate greater financial gains for their shareholders, increase market value, and have a significant competitive advantage. Overall, by increasing corporate environmental performance, practitioners can drive a firm towards success.

Limitations and Future Research

This study includes the following limitations. Firstly, the sample consisted of large publicly traded companies, namely the S&P 500 companies. In terms of generalizability this sample may not be representative of smaller companies or firms in different industries. Additionally, this study focused on the United States and a Western cultural setting which may also limit the generalizability of the findings to other cultural, geographical, and institutional factors. Lastly, the measurement of ESG scores can be different depending on the methodology used in each source. Although Global S&P is renowned as a reputable source for ESG Scores, other sources may provide different results.

Future research should address these limitations and explore the relationships in different contexts to advance our understanding of these complex dynamics and ascertain the generalizability of the results. Specifically, future research can enhance our contextual understanding by investigating factors like industry dynamics, regulations, culture, resources, and market conditions that can influence the effectiveness of EO and LTO. Researchers can identify when and how EO and LTO contribute to corporate environmental performance. For example, in dynamics industries with limited regulations a combination of high EO and moderate LTO may be optimal, while in stable industries with established regulations a higher focus on LTO may be preferred. Additionally, the same research can be conducted in a different setting, such as in emerging markets. Furthermore, future research could examine other mediating or moderating variables, such as internal lean practices and a strong environmental mission, that can further influence the relationship between entrepreneurship and sustainability. By considering these factors, researchers can provide nuanced recommendations to practitioners operating in different contexts.

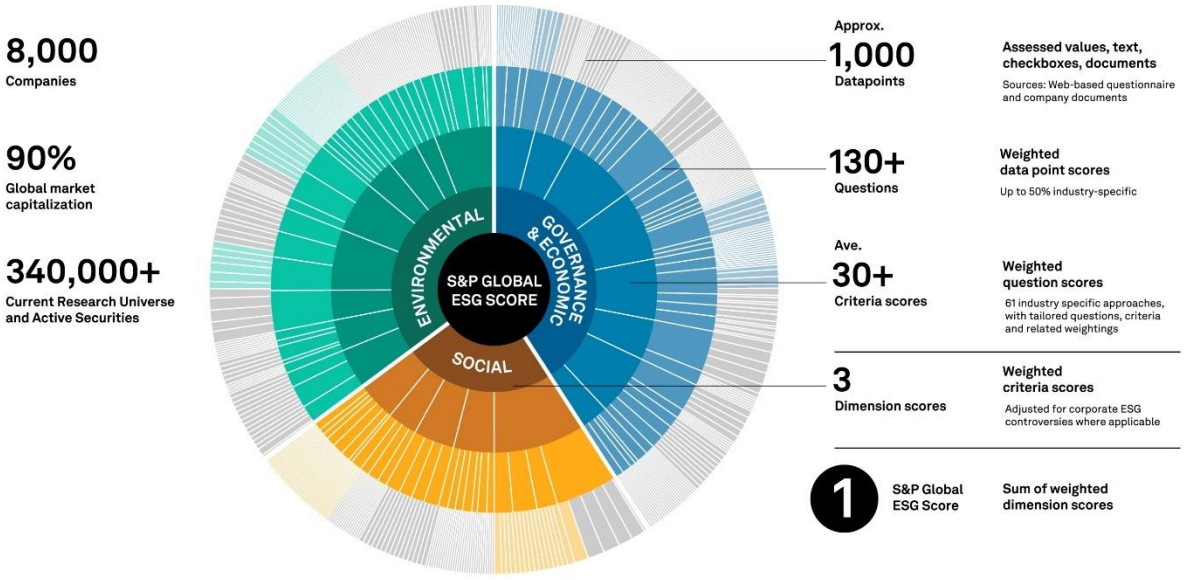
Conclusion

To conclude, this study contributes to the literature of entrepreneurship and corporate sustainability by exploring the interplay of entrepreneurial orientation and long-term orientation and corporate environmental performance. The findings formulate an answer to the research question indicating that while EO may not have a direct effect on ESG scores and LTO have a negative one, their interaction positively influences corporate environmental performance. Theoretically, this study expands our understanding of the complex and multifaceted dynamics between entrepreneurship and sustainability. Practically, practitioners by enhancing a firm's environmental performance can attract more investors, increase stock returns, and drive firm success. Regarding trustworthiness, this research ensured reliability through accurate measurement and statistical analysis. Validity is determined using established

constructs, while generalizability is achieved through large sample size. However, the limitations mentioned previously should be considered. All in all, this study encourages firms to engage in sustainable business practices, emphasizing the importance of addressing stakeholder demands to ensure better Environmental, Social, and Governance performance, which ultimately will lead to superior firm performance and to a better future.

Appendix

Appendix 1: ESG scores methodology



Source: https://www.spglobal.com/esg/solutions/data-intelligence-esg-scores

Appendix 2: Operationalization of variables

Variable	Name	Type	Operationalization	Source
Entrepreneurial Orientation	AvgEO	Numeric	Indicator of a company's EO, in averages calculated as (total number of EO words / total word count) as defined by Short et al. (2010)	Shareholder letters
Long-term Orientation	AvgLTO	Numeric	Indicator of a company's EO, in averages, calculated as (total number of LTO words / total word count) as defined by Slawinski & Bansal (2012)	Shareholder letters
Interaction Term of EO & LTO	AvgEOxLTO	Numeric	Interaction of (average) EO & LTO, calculated as [EO x (standardized) LTO]	Shareholder letters
Debt to Equity	ln_DebtEquityRatio	Numeric/ Ratio	Indicator of a company's financial leverage, calculated as (total debt / total equity)	Financial statements
Return on Assets	ln_ReturnOnAssets	Numeric/ Ratio	Indicator of a company's financial performance, calculated as (net income / average total assets	Financial statements
Total Long-term Assets	ln_TotalLongTermAssets	Numeric	Indicator of a company's long-term planning, calculated as (sum of a company's fixed assets & other long-term investments)	Financial statements
Revenue	ln_Revenue	Numeric	Indicator of a company's size, calculated as (net sales)	Financial statements
Sectors	SectorDum1-11	Categoric	Sectors defined as dummy variables	-

Appendix 3: Sectors distribution

	Sector	Freq.	Percent	Cum.
1	Communication Services	50	3.09	3.09
2	Consumer Discretionary	180	11.11	14.20
3	Consumer Staples	95	5.86	20.06
4	Energy	75	4.63	24.69
5	Financials	260	16.05	40.74
6	Health Care	210	12.96	53.70
7	Industrials	240	14.81	68.52
8	Information Technology	195	12.04	80.56
9	Materials	95	5.86	86.42
10	Real Estate	110	6.79	93.21
11	Utilities	110	6.79	100.00
	Total	1,620	100.00	

Appendix 4: Variance Inflation Factors (VIF)

Variable	VIF
LTO	1.01
D/E	1.02
TLA	2.83
ROA	1.55
REV	2.14
Mean VIF	1.71

Supplementary Material

Model 1

F-test

F (4, 323)	15.00
Prob > F	0.0000

LM test

chibar2 (01)	2219.42
Prob > chibar2	0.0000

Hausman test

chi2 (4)	7.74
Prob > chi2	0.1014

Model 2

F-test

F (6, 323)	2.31
Prob > F	0.0335

LM test

chibar2 (01)	281.27
Prob > chibar2	0.0000

Hausman test

chi2 (5)	6.81
Prob > chi2	0.2348

Regression results with different time lags

No lag

ESGScores	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
AvgEO	-.031	.351	-0.09	.93	-.719	.657	
AvgLTO	-.11	2.105	-0.05	.958	-4.235	4.016	
ln_DebtEquityRatio	-.006	.005	-1.18	.239	-.016	.004	
ln_TotalLongTerm	.05	.011	4.64	0	.029	.071	***
As~s							
ln_ReturnOnAssets	.003	.004	0.76	.448	-.005	.01	
ln_Revenue	.038	.013	2.83	.005	.012	.064	***
SectorDum1	-.18	.065	-2.78	.005	-.307	-.053	***
SectorDum2	-.048	.055	-0.87	.382	-.156	.06	
SectorDum3	.031	.062	0.49	.622	-.091	.152	
SectorDum4	0	.057	-0.01	.995	-.111	.111	
SectorDum5	-.088	.045	-1.94	.053	-.177	.001	*
SectorDum6	.034	.052	0.66	.511	-.067	.135	
SectorDum7	-.021	.05	-0.42	.675	-.12	.078	
SectorDum8	.031	.049	0.63	.528	-.065	.126	
SectorDum9	.06	.064	0.94	.346	-.065	.185	
SectorDum10	.091	.056	1.62	.106	-.019	.201	
o	0	.	.	.	.	.	
Constant	-.443	.09	-4.90	0	-.62	-.266	***

Mean dependent var	0.381	SD dependent var	0.206
Overall r-squared	0.171	Number of obs	1620
Chi-square	149.317	Prob > chi2	0.000
R-squared within	0.114	R-squared between	0.182

**** p<.01, ** p<.05, * p<.1*

1 lag

ESGScores	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
AvgEO	-.249	.37	-0.67	.501	-.974	.476	
L1. AvgLTO	1.694	2.434	0.70	.486	-3.076	6.464	
ln_DebtEquityRatio	-.006	.006	-1.08	.281	-.017	.005	
ln_TotalLongTerm	.051	.012	4.34	0	.028	.074	***
As~s							
ln_ReturnOnAssets	.004	.004	0.92	.36	-.004	.011	
ln_Revenue	.024	.014	1.75	.081	-.003	.051	*
SectorDum1	-.17	.066	-2.57	.01	-.299	-.04	**
SectorDum2	-.043	.056	-0.77	.443	-.153	.067	
SectorDum3	.028	.062	0.45	.651	-.094	.151	
SectorDum4	.017	.058	0.29	.77	-.096	.13	
SectorDum5	-.088	.046	-1.94	.052	-.178	.001	*
SectorDum6	.04	.052	0.76	.446	-.063	.143	
SectorDum7	-.019	.051	-0.37	.71	-.119	.081	
SectorDum8	.032	.049	0.65	.517	-.065	.129	
SectorDum9	.061	.064	0.96	.338	-.064	.186	
SectorDum10	.086	.056	1.52	.129	-.025	.196	
o	0	.	.	.	.	.	
Constant	-.309	.092	-3.38	.001	-.488	-.13	***

Mean dependent var	0.394	SD dependent var	0.204
Overall r-squared	0.160	Number of obs	1296
Chi-square	113.819	Prob > chi2	0.000
R-squared within	0.090	R-squared between	0.168

**** p<.01, ** p<.05, * p<.1*

Model 3

F-test

F (7, 323)	5.36
Prob > F	0.0000

LM test

chibar2 (01)	774.13
Prob > chibar2	0.0000

Hausman test

chi2 (7)	11.28
Prob > chi2	0.1267

Regression results with different time lags

No lag

ESGScores	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
AvgEO	-.025	.356	-0.07	.944	-.722	.672	
AvgLTO_z	-.001	.007	-0.18	.86	-.015	.012	
c.AvgEO#c.AvgLTO_z	.034	.207	0.17	.869	-.372	.441	
ln_DebtEquityRatio	-.006	.005	-1.18	.239	-.016	.004	
ln_TotalLongTerm As~s	.05	.011	4.65	0	.029	.071	***
ln_ReturnOnAssets	.003	.004	0.76	.446	-.005	.01	
ln_Revenue	.038	.013	2.83	.005	.012	.064	***
SectorDum1	-.18	.065	-2.78	.005	-.307	-.053	***
SectorDum2	-.048	.055	-0.87	.382	-.156	.06	
SectorDum3	.031	.062	0.49	.621	-.091	.152	
SectorDum4	0	.057	-0.01	.994	-.112	.111	
SectorDum5	-.088	.045	-1.94	.053	-.177	.001	*
SectorDum6	.034	.052	0.66	.511	-.067	.135	
SectorDum7	-.021	.05	-0.42	.675	-.12	.078	
SectorDum8	.031	.049	0.63	.529	-.065	.126	
SectorDum9	.06	.064	0.94	.346	-.065	.185	
SectorDum10	.091	.056	1.61	.106	-.019	.201	
o	0	.	.	.	.	.	
Constant	-.443	.09	-4.90	0	-.62	-.266	***

Mean dependent var	0.381	SD dependent var	0.206
Overall r-squared	0.171	Number of obs	1620
Chi-square	149.628	Prob > chi2	0.000
R-squared within	0.114	R-squared between	0.182

**** p<.01, ** p<.05, * p<.1*

1 lag

ESGScores	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
AvgEO	-.249	.37	-0.67	.5	-.974	.475	
L1.AvgLTO_z	.005	.007	0.64	.525	-.01	.019	
c.AvgEO#cL1.AvgLTO_z	-.086	.26	-0.33	.741	-.596	.424	
ln_DebtEquityRatio	-.006	.006	-1.09	.274	-.017	.005	
ln_TotalLongTerm As~s	.051	.012	4.33	0	.028	.074	***
ln_ReturnOnAssets	.003	.004	0.91	.361	-.004	.011	
ln_Revenue	.024	.014	1.75	.08	-.003	.051	*
SectorDum1	-.17	.066	-2.56	.01	-.3	-.04	**
SectorDum2	-.043	.056	-0.77	.441	-.153	.067	
SectorDum3	.028	.063	0.45	.656	-.095	.151	
SectorDum4	.017	.058	0.29	.772	-.096	.129	
SectorDum5	-.088	.046	-1.94	.052	-.178	.001	*
SectorDum6	.04	.052	0.76	.448	-.063	.142	
SectorDum7	-.019	.051	-0.37	.708	-.119	.081	
SectorDum8	.032	.049	0.64	.521	-.065	.128	
SectorDum9	.061	.064	0.96	.338	-.064	.186	
SectorDum10	.086	.056	1.52	.128	-.025	.196	
o	0	.	.	.	.	.	
Constant	-.307	.092	-3.35	.001	-.486	-.127	***

Mean dependent var	0.394	SD dependent var	0.204
Overall r-squared	0.160	Number of obs	1296
Chi-square	113.786	Prob > chi2	0.000
R-squared within	0.090	R-squared between	0.168

**** p<.01, ** p<.05, * p<.1*

3 lags

ESGScores	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
AvgEO	-.039	.333	-0.12	.907	-.692	.614	
L3.AvgLTO_z	-.001	.008	-0.10	.919	-.017	.015	
c.AvgEO#cL3.AvgLTO_z	-.15	.254	-0.59	.556	-.648	.349	
ln_DebtEquityRatio	-.005	.005	-0.97	.33	-.014	.005	
ln_TotalLongTermAs~s	.032	.01	3.35	.001	.013	.052	***
ln_ReturnOnAssets	.001	.003	0.40	.688	-.005	.008	
ln_Revenue	.008	.011	0.69	.492	-.015	.03	
SectorDum1	-.14	.07	-2.01	.044	-.276	-.004	**
SectorDum2	-.061	.056	-1.08	.28	-.171	.05	
SectorDum3	.018	.062	0.29	.774	-.104	.139	
SectorDum4	.058	.058	1.00	.315	-.055	.172	
SectorDum5	-.06	.046	-1.30	.195	-.15	.031	
SectorDum6	.047	.052	0.90	.37	-.055	.148	
SectorDum7	-.017	.052	-0.32	.746	-.119	.085	
SectorDum8	.031	.05	0.63	.532	-.066	.128	
SectorDum9	.067	.063	1.06	.289	-.057	.191	
SectorDum10	.097	.053	1.83	.067	-.007	.202	*
o	0	.	.	.	.	.	
Constant	.029	.086	0.34	.736	-.14	.198	

Mean dependent var	0.420	SD dependent var	0.193
Overall r-squared	0.138	Number of obs	648
Chi-square	67.486	Prob > chi2	0.000
R-squared within	0.024	R-squared between	0.141

**** p<.01, ** p<.05, * p<.1*

Slope tests: marginal effects and predicted margins

Summary statistics for EO and standardized LTO (z)

Variable	Obs	Mean	Std. Dev.	Min	Max
AvgEO	1620	.032	.01	0	.077
AvgLTO z	1620	0	1	-.947	5.84

Marginal Effects

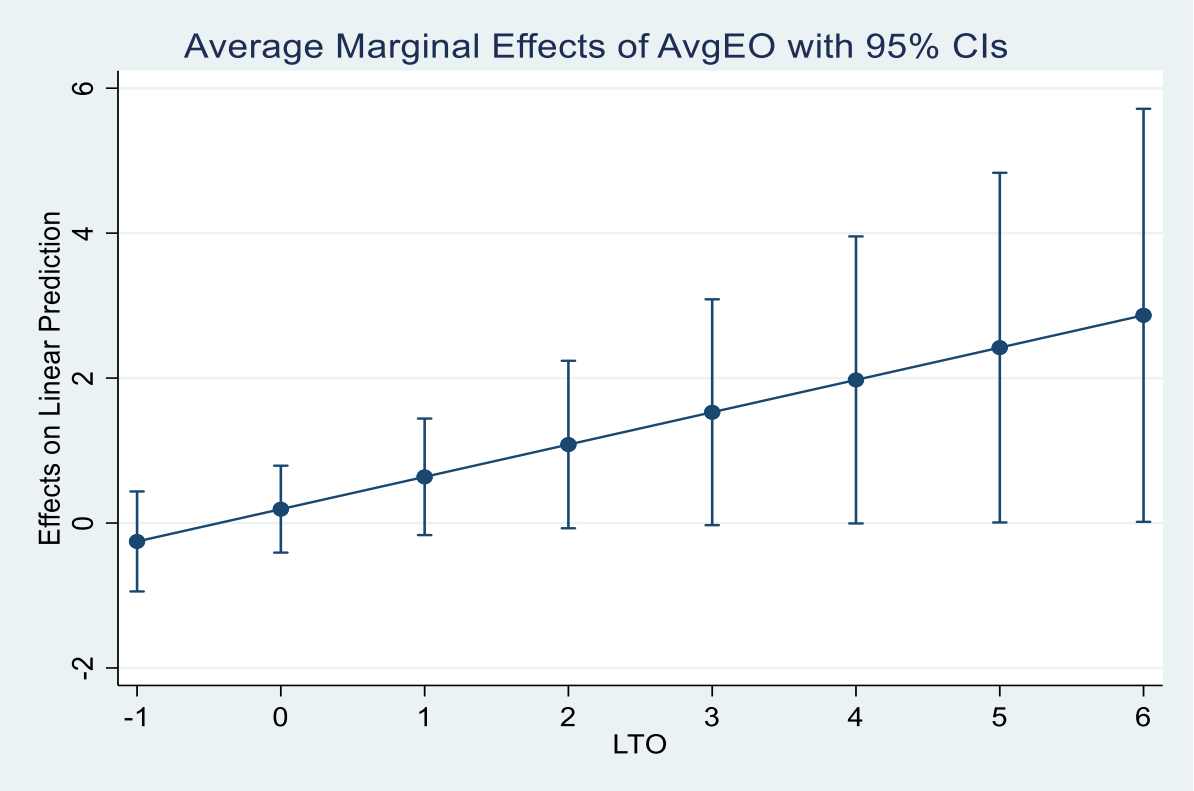
Average marginal effects Number of obs = 972
Model VCE : Robust

Expression : Linear prediction, predict()
dy/dx w.r.t. : AvgEO

1._at : L2.AvgLTO_z = -1
2._at : L2.AvgLTO_z = 0
3._at : L2.AvgLTO_z = 1
4._at : L2.AvgLTO_z = 2
5._at : L2.AvgLTO_z = 3
6._at : L2.AvgLTO_z = 4
7._at : L2.AvgLTO_z = 5
8._at : L2.AvgLTO_z = 6

Delta-method

	dy/dx	Std.Err.	z	P>z	[95%Conf.	Interval]
AvgEO						
_at						
1	-0.254	0.352	-0.720	0.470	-0.944	0.435
2	0.192	0.306	0.630	0.531	-0.408	0.791
3	0.637	0.410	1.550	0.120	-0.166	1.441
4	1.083	0.590	1.840	0.066	-0.072	2.239
5	1.529	0.795	1.920	0.054	-0.029	3.087
6	1.975	1.010	1.950	0.051	-0.006	3.955
7	2.420	1.231	1.970	0.049	0.008	4.833
8	2.866	1.454	1.970	0.049	0.016	5.716



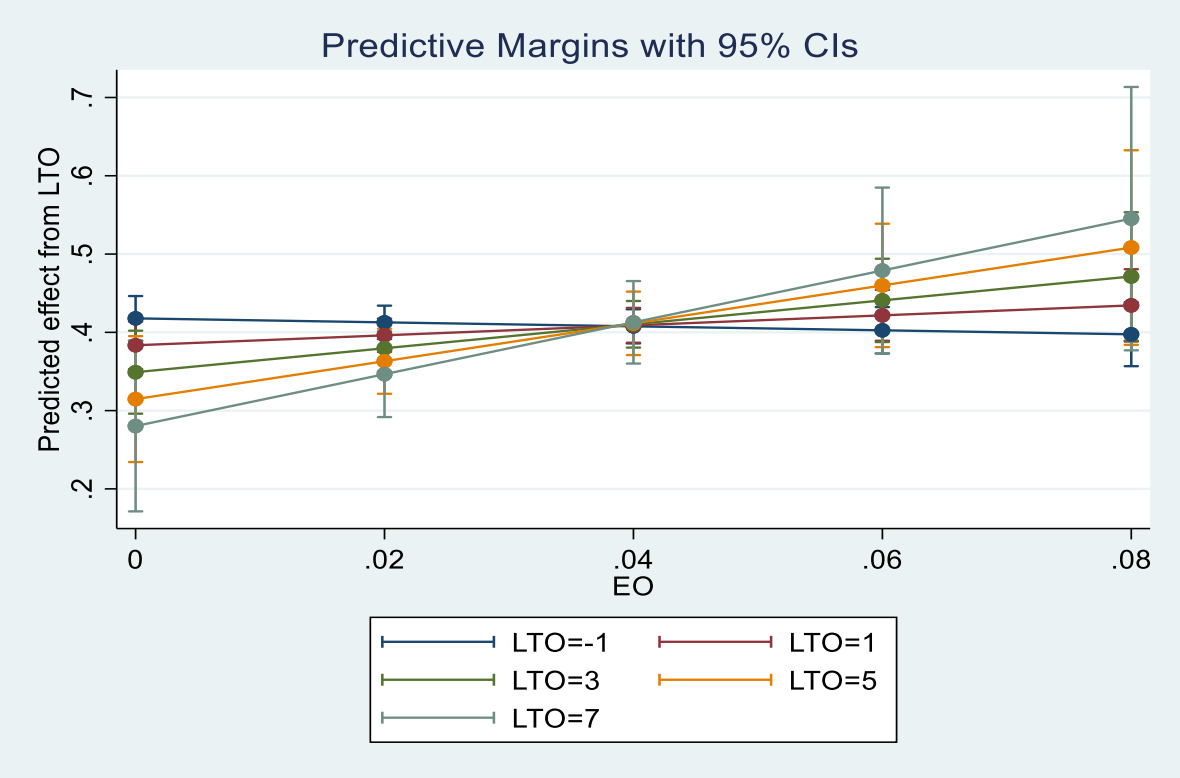
Predictive Margins

Predictive margins Number of obs = 972
Model VCE : Robust
Expression : Linear prediction, predict()

1._at	: AvgEO	=	0
	L2.AvgLTO_z	=	-1
2._at	: AvgEO	=	0
	L2.AvgLTO_z	=	1
3._at	: AvgEO	=	0
	L2.AvgLTO_z	=	3
4._at	: AvgEO	=	0
	L2.AvgLTO_z	=	5
5._at	: AvgEO	=	0
	L2.AvgLTO_z	=	7
6._at	: AvgEO	=	.02
	L2.AvgLTO_z	=	-1
7._at	: AvgEO	=	.02
	L2.AvgLTO_z	=	1
8._at	: AvgEO	=	.02
	L2.AvgLTO_z	=	3
9._at	: AvgEO	=	.02
	L2.AvgLTO_z	=	5
10._at	: AvgEO	=	.02
	L2.AvgLTO_z	=	7
11._at	: AvgEO	=	.04
	L2.AvgLTO_z	=	-1
12._at	: AvgEO	=	.04
	L2.AvgLTO_z	=	1
13._at	: AvgEO	=	.04
	L2.AvgLTO_z	=	3
14._at	: AvgEO	=	.04
	L2.AvgLTO_z	=	5
15._at	: AvgEO	=	.04
	L2.AvgLTO_z	=	7
16._at	: AvgEO	=	.06
	L2.AvgLTO_z	=	-1
17._at	: AvgEO	=	.06
	L2.AvgLTO_z	=	1
18._at	: AvgEO	=	.06
	L2.AvgLTO_z	=	3
19._at	: AvgEO	=	.06
	L2.AvgLTO_z	=	5
20._at	: AvgEO	=	.06
	L2.AvgLTO_z	=	7
21._at	: AvgEO	=	.08
	L2.AvgLTO_z	=	-1
22._at	: AvgEO	=	.08
	L2.AvgLTO_z	=	1
23._at	: AvgEO	=	.08
	L2.AvgLTO_z	=	3
24._at	: AvgEO	=	.08
	L2.AvgLTO_z	=	5
25._at	: AvgEO	=	.08
	L2.AvgLTO_z	=	7

Delta-method

	Margin	Std.Err.	z	P>z	[95%Conf.	Interval]
_at						
1	0.418	0.015	28.730	0.000	0.389	0.446
2	0.383	0.016	24.700	0.000	0.353	0.414
3	0.349	0.027	12.910	0.000	0.296	0.402
4	0.315	0.041	7.670	0.000	0.234	0.395
5	0.280	0.056	5.040	0.000	0.171	0.389
6	0.413	0.011	37.960	0.000	0.391	0.434
7	0.396	0.011	36.520	0.000	0.375	0.417
8	0.380	0.015	25.130	0.000	0.350	0.409
9	0.363	0.021	17.120	0.000	0.322	0.405
10	0.347	0.028	12.390	0.000	0.292	0.401
11	0.408	0.011	36.620	0.000	0.386	0.429
12	0.409	0.011	36.020	0.000	0.387	0.431
13	0.410	0.015	27.030	0.000	0.380	0.440
14	0.411	0.021	19.880	0.000	0.371	0.452
15	0.413	0.027	15.350	0.000	0.360	0.465
16	0.403	0.015	26.620	0.000	0.373	0.432
17	0.422	0.017	25.440	0.000	0.389	0.454
18	0.441	0.027	16.220	0.000	0.388	0.494
19	0.460	0.040	11.430	0.000	0.381	0.539
20	0.479	0.054	8.870	0.000	0.373	0.585
21	0.397	0.021	19.110	0.000	0.357	0.438
22	0.434	0.024	18.440	0.000	0.388	0.481
23	0.471	0.042	11.260	0.000	0.389	0.553
24	0.508	0.063	8.010	0.000	0.384	0.633
25	0.545	0.086	6.350	0.000	0.377	0.713



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